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Measuring Change in 'Hybrid Factories': Longitudinal Study of Japanese Manufacturing Subsidiaries in Poland

ABSTRACT

Objective: This article illustrates how, on the subsidiary level, the mixture of management practices in Japanese manufacturing subsidiaries operating in Poland changes over time.

Methodology: Study represents the first, rigorous, longitudinal replication of Japanese Multinational Enterprise Study Group hybridization studies conducted using the original methodology.

Researchers visited eight original research sites and measured changes after fourteen years in six of them.

Findings: The results indicate significant change in terms of manufacturing practices as well as in the localization of management. On the other hand, there has been practically no change in terms of equipment, organizational culture, and procurement methods.

Value Added: Article contributes to the existing literature in two ways. First it confirms dynamic nature of hybridization through a longitudinal exploration of changes that took place in management practices. Secondly, it combines JMNESG methodology with the most recent developments in research methods, increasing its clarity and replicability thus paving a way for future longitudinal studies of hybridization.

Recommendations: Based on this research future studies could replicate JMNESG studies in various locations and contexts thus providing further insights into the nature of change in the hybrid factories operating around the world and the nature of Japanese management over the last 20 years.

Key words: Japanese subsidiaries; hybridization; production management; Poland.

JEL codes: M16

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Introduction

Hybridization is a well-established concept both in the organizational and institutional theory and in the field of International Business (IB) (Abo, 2015; Becker-Ritterspach, 2009; Bills, 2010). In the latter field, for many years hybridization has been synonymous with 'japanization' (Turnbull, 1986; Bratton, 1992; Oliver & Wilkinson, 1988; 1992) as Japanese companies were among the first non-Western companies which attempted a large-scale transfer of their unique management routines. Even though over the years the term "japanization" gave way to a broader notion of "hybridization" and on a macro scale to divergence-convergence debate (Pudelko, 2005; Witt, 2008), it

continues to be strongly associated with Japanese multinational companies. Among studies of hybridization, the study initiated by Tetsuo Abo and Hiroshi Kumon and conducted by numerous researchers from a Japanese Multinational Enterprise Study Group (JMNESG) deserve special attention as one of the longest-running efforts in data collection about operations of multinational subsidiaries. The study began in the late 1980's and has been consistently carried out for more than twenty-five years as a result accumulating data from more than 500 Japanese subsidiaries located in more than thirty countries on five continents (Abo, 2015). Even when the "Japanese management" debate was gradually abandoned and the study faced increasing criticism (Abo, 2007; Giroud, 2015; Strange & Kawai, 2015), JMNESG researchers persisted amassing impressive amounts of data and observations concerning the Japanese subsidiary operations worldwide. However, despite conducting field research over a long period of time, once studied subsidiaries were never revisited in order to check the change that has occurred in terms of hybridization. One important exception has been a study of hybrid factories in United States conducted in 1989 and again in 2001, during which JMNESG researchers visited 32 and 37 at respective points in time and out of which 18 plants were overlapping between the two time periods (Kawamura, 2010, p. 80). The final analysis, however, was conducted for the two different samples rather than overlapping subsidiaries and the discussion focused on changes in the production system in the United States rather than company-level changes in organizational routines. As a result, to this day, we still know very little about how "hybrid factories" change over time.

This study aims to fill this gap by revisiting a group of Japanese subsidiaries located in Poland, which were studied by JMNESG researchers in 2003. It contributes to the literature in two ways. First, it is the first-ever rigorously designed and carried out longitudinal replication of the original JMNESEG study which aims at measuring the change in terms of "hybridization" on a subsidiary level. Second, it addresses the methodological issues raised by the critics by combining the original JMNESG 5-point scale methodology

with the most recent developments in qualitative research including mixed methods (Creswell & Clark, 2007; Edmonds & Kennedy, 2016), IB case studies (Marschan-Piekkari & Welch, 2011), longitudinal research (Hassett & Paavilainen-Mäntymäki, 2013) and qualitative coding techniques (Saldana, 2015).

Literature review

An overview of the “hybridization” debate jungle

The debate concerning hybridization has been going on for years and the concept itself appeared under various names in various fields of inquiry including production technology, culture, strategy, and institutional theory (Adler, 1999; Becker-Ritterspach, 2009). In the broadest sense hybridization can be defined as a “process of transfer and adaption of a complex organizational system from one social context to another resulting in a completely new system is neither a copy of the original model nor a replica of existing local patterns” (Westney, 1999, p. 385). The origins of this debate can be traced back to early studies of Japanese multinationals, which were the first heavily studied population of non-Western companies (Westney, 2009). The earliest studies concerning the Japanese companies (Abegglen, 1958; Yoshino, 1969; Dore, 1973) have revealed a number of unique characteristics and deep socio-cultural embeddedness of Japanese management and production practices. Consequently, when Japanese companies began their foreign expansion in the United States and the United Kingdom, researchers focused on the issue of international transfer of Japanese business practices coining the term “japanization” to describe a mixture of Japanese and local practices (Turnbull, 1986; Oliver & Wilkinson, 1988; 1992). As the early studies dominated by the cultural approach gave a way to focus on production management and manufacturing (Keeley, 2001) this term gradually gave way to a more neutral and general term of “hybridization” (Adler, 1999). Most notable work in this period was done by Boyer (1998), who refined the concept of hybridization by adding a production model to

an existing dichotomy of host and home country institutional contexts and noted that hybridization is an on-going process that can involve a two-way interaction rather than a straightforward transfer of practices. The function of manufacturing production played also a central role in research done by Japanese scholars, who argued that Japanese companies both at home and abroad undergo a continuous evolutionary process that is centered around development of their manufacturing capabilities (Cho, 1994; Fujimoto, 1999). Other researchers combining hybridization with the patterns of organizational learning in Japanese multinationals started coming up with interesting typologies of different hybrid models in terms of HRM (Bird, Taylor & Beechler, 1998). In the 2000's, the debate about hybridization shifted to a macro perspective in the form of convergence divergence debate (Pudelko, 2005). On the other hand, it became increasingly dispersed as the growing number of researchers began conducting studies of individual management practices in traditional locations such as Europe (Morris et al. 2000; Yokozawa, et al. 2012) or the United States (Gump, 2006), but also in China (Gamble, 2010), Southeast Asia (Ngoc, 2009), or South America (Sparkes & Miyake, 2000). All these studies confirmed selective transfer of Japanese practices and their gradual adaptation to local conditions. Despite important contributions of each study, any comparative analysis became impossible due to the different research approaches, indicators, and narrow research questions.

In the recent years, hybridization studies has continued to diversify even more, both due to the constant changes in host country context as well as shifts in the traditional management methods of Japanese MNCs (Pudelko, 2009; Sekiguchi et al. 2016). Some researchers have extended the notion of hybridization to non-Japanese samples (Meardi & Tóth, 2006; Becker-Ritterspach, 2009). The concept of hybridization has gradually been extended beyond the manufacturing as researchers begin to develop new concepts like 'hybrid managers' (Schlunze, 2012), which focuses on the roles which expatriate managers play in the subsidiaries and in MNCs. Some studies also begin perceiving hybridization as a mixture of cross-sectoral rather

than cross country practices (Bills, 2010). Despite some notable efforts to summarize the debate (Becker-Ritterspach, 2009), it is safe to say that to this day it remains a 'theoretical jungle', which is atomized, unstructured, and somewhat detached from the mainstream of organizational theory.

The uniqueness of JMNESG hybridization study and its criticism

Particularly when seen in the context described above, JMNESG study stands out as a uniquely consistent and long-lasting effort in data collection. It is unparalleled both in terms of geographical scope and historical length. Similarly to other studies concerning the transfer of Japanese management, JMNESG study began in the late 1980's in the United States (1988–1989), where the core assumptions and methodology was formed (Abo, 2015). Then, it has been consistently carried out for more than 25 years by numerous researchers, who collected data from more than 500 Japanese subsidiaries located in more than thirty countries on five continents, including North America (1989 and 2000–2001); East Asia (1992–1993); UK and Western Europe (1997–1998); South America (2001 and 2006); China (2002); Central and Eastern Europe (2003); and, most recently, Africa (2009–2013). What is most striking about JMNESG hybridization research is that, through all these years and rounds of empirical field studies, it has been consistently applying the same research instrument based on twenty-three qualitative criteria grouped in six dimensions and a five-point scale of application/adaptation (Abo, 2015), which in its core represents the underlying dilemma of local responsiveness and global integration (Bartlett & Ghoshal, 2002) faced by MNEs all over the world. The definition of hybridization according to that model was a mixture of Japanese practices transferred and applied in a subsidiary and practices adopted locally (Abo, 1994). Due to this fact JMNESG researchers have resulted in an enormously rich, coherent dataset consisting of measurements of degrees of hybridization in subsidiaries

all over the world, which constitutes a unique point of reference for future follow-up studies, replications, and comparative research.

Despite its notable contributions in recent years, the traditional definition of the hybridization and JMNESEG studies, in particular, have come under an increased deal of scrutiny. Main points of concern usually focus on several issues including the lack of consensus on the underlying paradigm (Abo, 2007); the issue of dynamic changes in local and global context and their influence on the content of the 23 criteria (Abo, 2007; Strange & Kawai, 2015); the issue of dynamic changes on the subsidiary level and the influence of Japanese expatriates and other organizational actors (Giroud, 2015); and the perceived need to combine hybridization study with some mainstream theories like knowledge management or expatriate roles (Strange & Kawai, 2015) or evolutionary theory (Olejniczak & Itohisa, 2017).

One of the key misunderstandings concerning JMNESEG studies is related to its underlying paradigm and methods. Historically, hybridization studies began as cultural inquiry amidst height of the "Japanese management" debate and were focused on deep understanding of the new context in which Japanese subsidiaries were functioning. Since at the time qualitative studies were still in their formative period, JMNESEG researchers presented their results in the form of quantitative scale (Abo, 1994), despite being predominantly focused on understanding the socio-cultural context and despite utilizing predominantly qualitative methods of data collection and analysis (i.e. observation, unstructured interviews, inter-subjective analysis). In addition first empirical data was gathered in Japanese factories in the United States (Abo, 1994), which resulted in drastic, polarizing distinction between "Japanese" and "local" practices. Ironically, the increasing recognition of the research and popularity of the methodology resulted in the adoption of the methodology by an increasing number of researchers operating within the positivist paradigm in the fields of management and IB. Consequently, the measurement using twenty-three criteria has become a standard and the study has been replicated in various countries with subsequent rounds of research and quantitative

results began to be compared in separation from the original socio-cultural context. These developments, although expanding the scope of the study, triggered a wave of criticism from the point of view of positivist/functionalist paradigm critics, criticizing the study for lack of objectivity, clarity, and validity of comparisons between different cultural and time contexts (Abo, 2007).

The issue of dynamic changes in local and global context and their influence on the content of the 23 criteria (Abo, 2007; Strange & Kawai, 2015) is a wide subject considered by JMNESG researchers almost from the inception of the theory. As years go by, both the Japanese management model and the local socio-economic conditions of host countries continue to change (Sekiguchi et al., 2016). The question is if and how to account for these changes in the application-adaptation model and the content of 23 criteria without compromising the consistency of the measurement.

The issue of dynamic changes on the subsidiary level, on the other hand, has largely overlooked potential contribution of the JMNESG studies. Despite gathering micro-level data through laborious process of field visits of individual subsidiaries, JMNESG researchers tend to present results on an aggregated level of geographic regions, thus losing most of the contextual insights. Consequently, some commentators call for a more focused studies which analyse how 'hybrid' factories evolve over time and what factors and organizational actors contribute to that process (Giroud, 2015) or how subsidiary roles as knowledge creators change over time including the possibility of reverse knowledge transfer (Zhang et al., 2013).

Finally, some commentators argue that hybridization studies would benefit from focusing on some of the existing hot topics in the mainstream IB such as the knowledge transfer between parent and the subsidiary, the influence of ownership structures and corporate-governance mechanisms on strategy or the roles of expatriates (Strange & Kawai, 2015). Other authors argue that hybridization study might benefit from merging with existing mainstream organizational theories such as evolutionary approach (Olejniczak & Itohisa, 2017).

Summary and Research Gap

In the context of the discussion presented above, we argue that JMNESG study is a uniquely consistent study offering a wealth of potential contribution but has so far failed to do so due to a lack of rigorously designed longitudinal studies concerning hybridization, as a result of which we still know very little about how hybrids change over time. This study will aim at addressing two out of four issues mentioned above. First we will clarify the underlying paradigm and methodology and focus on showing how the methodology can be applied to measure change that takes place on a subsidiary level. Due to space limitation the wider issues of dynamic changes in the nature of Japanese management and their influence on the application-adaptation model, as well as the issue of combining hybridization with one of the existing mainstream theories have to be excluded from this article and left to the consideration of JMNESG researchers. Following paragraphs describe our research approach.

The Context

This study investigates the development of Japanese subsidiaries in the context of Poland. Given the scarcity of research concerning foreign subsidiaries in emerging economies in general (Brewster et al., 2016) and former socialist economies in particular (Meardi, 2002, 2007; Meardi & Toth, 2006; Berber et al. 2017), our study has the potential to provide new insights in this context. Poland provides an interesting ground for analysing development of MNE subsidiaries due to relics of its socialist past including strong labour unions, low labour productivity and a high level of social benefits (Weinstein & Obloj, 2002; Moczydłowska, 2012). While the rapid pace of transformation attracted FDI, making Poland one of the largest recipients of FDI in the region (Cieślik & Ryan, 2002), it has also led to high levels of unemployment and a restructuring of the workforce. In recent UNCTAD reports (2016), Poland has been

classified as a 'developed' economy, as its labour costs continue to grow as it experiences a shift towards knowledge intensive sectors and R&D centres.

We focused on Japanese FDI, first because of the focus of the original study but also because Japanese FDI has played important roles in foreign host countries in general and the socio-cultural differences between Japan and Poland specifically. While most FDI in Poland originate from Western Europe, Japan has also become an important investor since the late 1990s/early 2000s (Cieślak & Ryan, 2002). Japanese subsidiaries in Poland represent an interesting "second wave" of Japanese FDI in Europe's emerging economies. Given the fact that the first wave of Japanese FDI occurred in the UK and Western Europe in the 1970s and 1980s, these relatively young subsidiaries in emerging economies offer a unique possibility of conducting interviews with local managers employed since the subsidiary's establishment, which might have been impossible in much older Japanese subsidiaries in Western Europe (Abo, 2007). Despite their interesting characteristics, little is known about Japanese subsidiaries in Poland. Given the increasing interest in quantitative studies based on the Toyo Keizai database of Japanese subsidiaries which includes CEE (Ando, 2016; Beamish, 1997; Gong, 2003), providing an in-depth process perspective on this population of companies seems a potentially important contribution.

Finally, the Japanese subsidiaries in Poland were chosen because of substantial socio-cultural differences between the two countries, which might influence the process of subsidiary development. According to Hall's classification, the two countries are positioned on opposing sides, where Japan is a high context and Poland a low context culture (Hall, 1990; Gesteland, 2005), which could potentially have influence on employee relations and communication with employees. When using Hofstede's (2001) dimensions we find significant differences in the time orientation dimension and to a lesser extent in both masculinity-femininity and power distance dimensions. Even where Hofstede's dimensions show some surprising similarity in the dimension of 'uncertainty avoidance', a closer comparison with the GLOBE

study reveals that this similarity is only at the level of desired values rather than actual practices. In addition, results of the GLOBE study indicate that Poland and Japan differ in the areas of assertiveness, performance orientation, institutional collectivism and humane orientation, and places the two countries in different country clusters: Poland in the Eastern Europe cluster and Japan in the Confucian Asia cluster. All of these contextual issues suggest the importance of the proposed study.

Methodology

The main research question this study aims to answer is: "What changes took place in the degree of hybridization of Japanese subsidiaries in Poland?". In addition to answering this question, we will try to identify the key contingency factors, which influenced the process in each of the criteria. In order to overcome the existing scepticism towards the JMNESG methodology, we have decided to strictly follow procedures of the most recent methodological literature (Creswell & Creswell, 2017). Consequently, we will begin by clarifying our research design, starting with an underlying paradigm, research method and strategy, all the way to specific techniques and procedures of data collection and analysis. The following paragraphs present the results of our efforts to clarify the procedures applied by JMNESG researchers and translate them into the universal language of research methodology.

Paradigm

Being aware of the criticism resulting from a misunderstanding concerning the underlying paradigm of the JMNESG study, in this study we have decided to employ a pragmatic paradigm (Mackenzie & Knipe, 2006), which gives a priority to answering the key research question. Following this assumption, we aimed at describing hybridization from various perspectives using a mixture of qualitative and quantitative approaches. Quantitative approach

was embodied in twenty-three predefined criteria and five-point scale of “adaptation-application” adopted from previous JMNESG studies. Qualitative approach was embodied by remaining open to various interpretations of the observed phenomena and changes that took place in the subsidiaries. Consequently, we drew the line of paradigmatic separation between the quantitative results in the form of twenty-three criteria, which measure hybridization and qualitative interpretations concerning the reasons for change. In addition, it is important to mention that in line with the original assumptions of JMNESG methodology, we gave priority to qualitative approach throughout the study.

Research Method and Strategy

Staying aware of the pragmatic paradigm we have decided to employ mixed methods (Creswell & Clark, 2007), which require researchers to make three key decisions concerning the timing, focus, and mixing of qualitative and quantitative methods (Edmonds & Kennedy, 2016). Research design that we applied can be described as an embedded case study design (Edmonds & Kennedy, 2016), in which the usage of methods is sequential (first quantitative then qualitative), while the focus of the entire study remains on qualitative data, providing rich interpretations in the context of the case. As a result, quantitative data in the form of the hybridization score were first embedded and analysed in the context of each case and only then aggregated to a country level in order to compare interpretations concerning the nature and reasons of change.

The strategy of data collection was a longitudinal, multiple, comparative case study (Yin, 2009). The case study method provided the ideal strategy that guaranteed methodological rigour, while sustaining the contextual richness of each single case. In line with the three principles of data collection, we have utilized multiple sources of data, developed a case study database, and maintained a chain of evidence between the results and the original data (Yin, 2009, p. 114). Longitudinal aspect was dictated by the

nature of the study as a replication and revisiting of the same subsidiaries after fourteen years. As it has been the first replication there has been no specific rationale behind the time period. The period was long enough to produce some significant changes especially given the major events that took place during that time including accession of CEE to European Union in 2004 and financial crisis of 2009-2010. At the same time the period was concise enough to allow for retrospective interviewing concerning the reasons behind changes that took place, all of local respondents were present in the subsidiary throughout the entire period and were able to recall the main changes and their rationale. In addition, the rigour and validity of the study was guaranteed by the participation of researchers conducting the original 2003 study and obtaining access to their original notes and observations. The measurement of reality was conducted in two separate points in time, i.e. 2003 and 2017. Since both times data collection focused on the present conditions, it was free from the main biases of retrospective studies such as recall and spoiler effects (Van de Ven & Huber, 1990; Golden 1997). The only exceptions were interpretations concerning the reasons for change, obtained directly from respondents based on retrospective interviewing. Finally, the comparative aspect of the study was managed by separating longitudinal analysis from across-case comparative analysis. Each study site was first analysed separately in the form of a longitudinal case study (40–60 pages each) and then cross-analysed along corporate profiles and the twenty-three criteria.

Data Collection and Analysis

In line with the case study methodology and the replication objective of the study, we have focused on data collection in research sites that were visited in the 2003 study. Out of eight research sites visited in 2003, only six remained in operation in 2017. One company was liquidated in 2011, and the second company has been taken over by a non-Japanese entity and under-

went significant changes in terms of management and production process. Although we managed to conduct interviews in both of these companies, one with a Japanese manager responsible for the company closure and the second with local managers that remained in the company under the new ownership, both of these companies were excluded from the final analysis. Consequently, full-fledged data collection and analysis was conducted for six out of the original eight research sites. In each of these sites, we have conducted a field visit including an interview with both Japanese and Polish managers and a factory tour followed by a Q&A session. Interviews were semi-structured and followed the logic of the twenty-three criteria. All interviews were recorded and conducted in English or Japanese, plus, in some cases, native language was used. For presentation purpose, we translated relevant passages into English here. In preparation for the visit, we have collected a wide array of information from secondary sources, including websites, press releases, TV appearances, and business reports. During the visit, each company provided us with a filled-in questionnaire presenting the company profile and a presentation containing some primary data about their organization. Table 1 presents the summary of the companies and data collected about each of them.

Table 1. Summary of the collected data

	Industry	Scale	Mode of investments	Top manager's nationality	Respondents	Length of interviews	Number of pages of secondary data
PAE	Automotive	Large	Brown-field	Polish	Polish President Japanese Advisor Polish Management Board	2 h 3 min	442

PAI (takeover)	Automotive	Large	Green-field	Polish	Polish Factory Director	38 min	244
PAM	Automotive	Large	Brown-field	Japanese	Japanese Production Director Polish HR Manager	1 h 21 min	163
PAT (closed)	Automotive	Large	Green-field	Japanese	Last Japanese President	3 h 13 min	113
PAV	Automotive	Large	Green-field	Japanese	Polish President Japanese Management Board Polish HR Manager	2 h 29 min	960
PAW	Automotive	Large	Brown-field	Japanese	Japanese President Polish Factory Director HR Specialist	3 h 31 min	434
PEK	Electronics	Large	Green-field	Japanese	Japanese President Polish Production Director Polish HR Director	2 h 14 min	293
POX	Other	Large	Green-field	Polish	Polish President Japanese Production Director	2 h 27 min	172
						17 h 56 min	2821

Source: own elaboration.

Data analysis was conducted using coding methods (Saldana, 2015). In the first stage of coding we have applied attribute coding technique (Saldana, 2015, p. 82) to clarify the current profile of the company. This was followed

by the structural coding technique (Saldana, 2015, p. 98), which followed the twenty-three criteria selecting relevant data required for scoring the level of application or adaptation. Based on the first stage of coding, we have prepared a case study for each company, including company profile, description of the current state of routines in line with the twenty-three criteria, 2003 and 2017 research notes, and a score comparison table with an explanation of the rationale behind the score. Based on the case study and research notes, in line with the original JMNESG methodology, a one-day-long scoring session attended by all four researchers was performed. During the session, each of the twenty-three criteria for each company were discussed in order to reach the inter-subjective agreement concerning the result. The scoring reasons for each criterion were based on data collected in the companies and were noted down in a summary table included in the case. For the sake of transparency, the scoring session was recorded, which permits, if needed, to go back to the rationale of the score. The result of this stage of analysis was summarized in a quantitative form of the diagram and the degree of change between the 2003 and 2017 results.

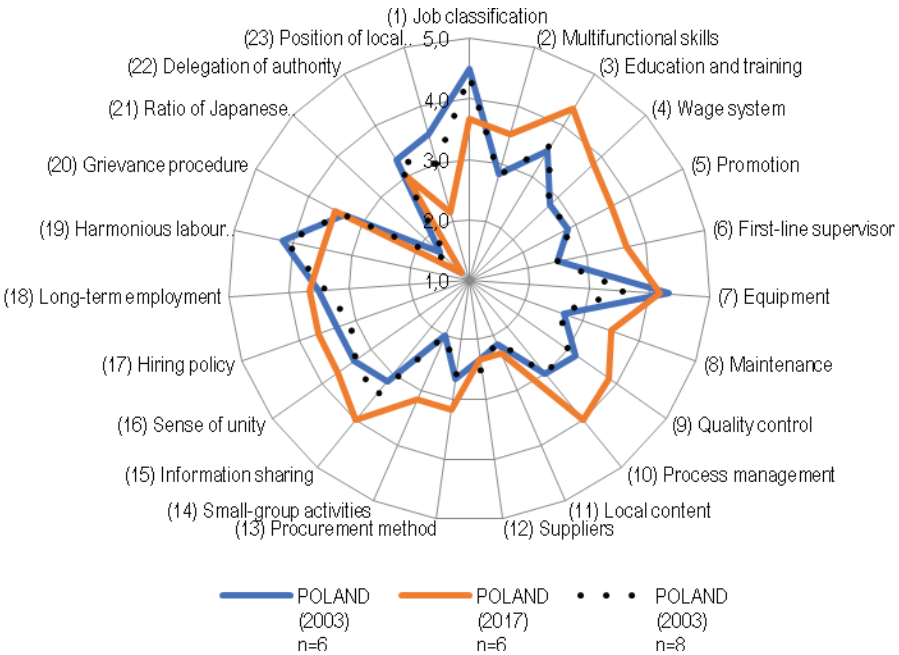
Subsequently, the second stage of coding was conducted using causation coding technique (Saldana, 2015, p. 186) and axial coding technique (Saldana, 2015, p. 244) in order to identify the influencing factors in each of the twenty-three criteria and provide explanation for causal relationships. The results of this analysis aimed at answering the second, more qualitative part of the research question. The results of the analysis are presented in the following paragraphs.

Findings concerning change in 23 criteria

The findings concerning the degree of hybridization are presented in line with the logic of JMNESG underlying methodology of six groups and twenty-three criteria. Since one of the subsidiaries studied was closed down in 2011 and the other was taken over by a non-Japanese company in 2014,

both were excluded from the study. Consequently, for the sake of rigour, the comparison is based on the scores between six exactly same companies. Figure 1 presents the overview of individual scores in the twenty-three criteria and the difference between 2003 and 2017 results. Table 2 presents a detailed summary of the scores for 2003 and 2017, the degree of change that took place between these two time periods and the degree of variance in each category.

Figure 1. Results for 23 criteria



Source: own elaboration based on the results of analysis.

Table 2. Scores in 23 criteria including degree of change and variation

		PO- LAND (2003) n=6	PO- LAND (2017) n=6		

I Work organization and administration	(1) Job classification	4,5 (4,4)*	3,7	-0,8	0,5
	(2) Multifunctional skills	2,8 (2,8)	3,5	0,7	1,0
	(3) Education and training	3,5 (3,6)	4,3	0,8	0,5
	(4) Wage system	2,8 (2,8)	3,8	1,0	0,4
	(5) Promotion	2,8 (2,9)	3,7	0,8	0,8
	(6) First-line supervisor	2,5 (2,5)	3,7	1,2	0,8
II Production management	(7) Equipment	4,3 (3,6)	4,2	-0,1	0,4
	(8) Maintenance	2,7 (2,7)	3,5	0,8	0,5
	(9) Quality control	3,2 (3,2)	3,8	0,7	0,4
	(10) Process management	3,0 (3,0)	4,0	1,0	0,0
III Procurement	(11) Local content	2,2 (2,1)	2,3	0,2	0,8
	(12) Suppliers	2,3 (2,5)	2,3	0,0	1,0
	(13) Procurement method	2,7 (2,6)	3,2	0,5	0,8
IV Group consciousness	(14) Small-group activities	2,0 (2,0)	3,2	1,2	1,2
	(15) Information sharing	3,2 (3,5)	4,0	0,8	0,6
	(16) Sense of unity	3,3 (3,3)	3,7	0,3	0,8
V Labour relation	(17) Hiring policy	3,3 (3,1)	3,7	0,3	0,5
	(18) Long-term employment	3,5 (3,4)	3,7	0,2	0,8
	(19) Harmonious labour relations	4,2 (4,1)	3,5	-0,7	0,8
	(20) Grievance procedure	3,3 (3,4)	3,5	0,2	0,8
VI Parent–subsidiary relations	(21) Ratio of Japanese expatriates	1,7 (1,5)	1,2	-0,5	0,4
	(22) Delegation of authority	3,3 (3,3)	3,0	-0,3	0,9
	(23) Position of local managers	3,5 (3,0)	2,2	-1,3	1,2
	AVERAGE	3,07	3,37	0,3	0,5

* The scores in () represent 2003 score as calculated for N=8. For the sake of rigour, we compare the scores between six exactly same companies.

Source: own elaboration based on the results of analysis.

The result of measurement and the reasons for change for each group of criteria are discussed in the following paragraphs. Due to non-disclosure agreements made with the companies, data can only be presented in an anonymized and aggregated fashion without presenting the individual scores of each company.

Group I: Work Organization and Administration

In this group, we observe a significant change in the direction of "application" in almost all of the constituting criteria. The only exception was (1) "Job classification", in which the score decreased from 4,5 in 2003 to 3,7 in 2017. This means that the number of job grades have increased from the original division into two categories of "direct" and "indirect" employees to multilevel hierarchies, including operators, senior operators, group leaders and various types of technical staff. In all cases, these developments were justified by the need for creating advancement opportunities for employees, rapidly developing their competences. The score for (2) "Multifunctional skills" changed from 2,8 to 3,5. In reality, this meant changing from a limited use of job rotation within the line to extensive use of job rotation within and sometimes between the production lines, as well as the use of competency matrices, employee assessment, training, and career development. The score for (3) "Education and training" changed from 3,5 to 4,3, which represented a shift from a training process based on intensive training in Japan, OJT, and specialized training programmes to development of internal training centres called "dojos", standardization of training materials based on Japanese templates, and development of internal trainers capable of conducting basic training while maintaining strong relationship with Japan for the purpose of new technologies and production lines. The score (4) "Wage system" increased from 2,8 to 3,8 which represents significant change in the direction of individualized pay. In reality, this meant that, while the number of job grades increased, the relationship between the actual wage and basic wage stipulated in the

contract and influenced by country regulations diminished. Wage in the majority of subsidiaries was increasing based on complex bonus systems, which calculated attendance, performance, quality, experience, and tenure. The main distinction between wages in Polish subsidiaries and the ideal Japanese system was a wide disparity between the wages of management and employees. Similarly to wages, the score in (5) "Promotion" changed from 2,8 to 3,7. This meant that the majority of promotions were conducted internally and in many cases companies had employees who changed from the operator level to middle or even top management positions. Finally, the score in criterion (6) "First-line supervisor" changed from 2,5 to 3,5, which represents the change in competences of line leaders and supervisors. Due to short time of operations in 2003, leaders were only responsible for maintaining the quality and some personnel affairs. In 2017, their responsibilities additionally included assessment, training, coordination of small group activities, personnel management and planning, and to some extent setting production standards.

Group II: Production Management

In the area of production management, we could observe a very limited change in terms of equipment coupled with significant change in terms of production routines and manufacturing capability. There has been virtually no change in the score (7) "Equipment", representing the ratio of Japanese equipment used by subsidiaries, as it was 4,3 in 2003 and 4,2 in 2017, meaning that all companies used mostly Japanese equipment. This, quite obviously, illustrates the rigidity of equipment investments, which tend to be stable over long periods of time. The minor shift in the direction of localization represents efforts of some subsidiaries to localize the equipment due to cost-cutting or demands of the local customers who required its use. The remaining three criteria represent significant change in the direction of application. The score for (8) "Maintenance" changed from 2,7 to 3,5, which

represents some change in terms of the internalization of maintenance by employees. Although in all companies maintenance was performed by specialized technical staff, they were recruited and trained internally. In addition, some companies experimented with TPM and line employees were increasingly involved in basic maintenance such as cleaning and checks. The score for (9) "Quality control" changed from 3,2 to 3,8, which indicated change in terms of including quality control in the production process and involving line employees in quality control and kaizen activities. All companies were awarded multiple quality awards by their clients, which proves that they were able to produce reliable quality on levels comparable to Japan. Finally, in (10) "Process management" we noted a surprising jump from 3,0 to 4,0. In reality, this was represented by the significant increase in the diversity and technological complexity of product portfolio coupled with the decrease in the scale of production batches. All subsidiaries moved from limited product portfolios produced in large batches and delivered to one or two key clients to delivering small batches of multiple products to various clients, including top brands of Japanese and European manufacturers like Toyota, BMW, Mercedes, and Porsche. In terms of management, such portfolio required the flexibility of employee skills, production planning, quick refitting of machines, the flexibility of production line, all the while maintaining a high level of quality.

Group III: Procurement

The area of procurement shows where the changes have probably been the most limited. The score for (11) "Local content" changed only slightly from 2,2 to 2,3, which indicates both that resources and components are mostly locally sourced from the EU and that there has been a small change in favour of importing components from Japan, mostly due to the increasing variety of product portfolio. Similarly, the score for suppliers has remained at the 2,3 level, which indicates that suppliers are non-Japanese companies and, in most cases, local. Finally, the score for (13) "Procurement method" has increased

slightly from 2,7 to 3,2. This means that, even though the relationships with suppliers were still transaction-based, there has been some effort in the direction of strengthening cooperation and improving the quality of supplies.

Group IV: Group consciousness

The area of group consciousness covers varied areas of developing small group activities and information systems while developing a strong egalitarian organizational culture. As a result, the change varied in some criteria being bigger than in others. The score for (14) "Small-group activities" changed significantly from 2,0 in 2003 to 3,2 in 2017. In reality, this meant that the majority of subsidiaries implemented kaizen activities and some of them were experimenting with the implementation of quality circles. In subsidiaries, which implemented Quality Circles, employees were working under the supervision of team leaders or QC specialists in order to develop problem-solving skills, and some circles already had the experience of participating in international competitions. The score for (15) "Information sharing" increased slightly from 3,2 to 4,0, which meant that the majority of companies succeeded in developing company-wide information systems, including regular meetings with management, morning meetings, information boards, TVs, and newsletters. Finally, the score for (16) "Sense of unity" changed only slightly from 3,3 to 3,7. This resulted from a large disparity in efforts put into bringing the employees together. Some subsidiaries proactively organized events and activities, while others relied on employee-based networks and initiatives. All companies had classical symbols of Japanese egalitarianism, such as unified work clothes, common space offices, cafeterias, and parking lots.

Group V: Labour relation

The change in the area of labour relations was limited. The score for (17) "Hiring policy" increased from 3,3 in 2003 to 3,7 in 2017, which represented

an increase in attention paid to the selection of candidates. Although some companies used temporary work agencies, the majority closely cooperated with local technical schools and universities and organized internships in order to attract candidates early on. Hiring processes involved standard CV screening, interviews with direct supervisors and managements, and, in some cases, technical and manual tests. Despite formal recruitment, due to the lack of labour force or difficult working conditions, the companies could not be very picky about their employees. The score for long-term employment increased only slightly from 3,5 to 3,7. In reality, this meant that, although companies did not have specific policies concerning avoidance of layoffs, the employees had long tenures and low turnover. Some companies managed to avoid layoff during crisis while others had to conduct them or use temporary employees. The score for (19) "Harmonious labour relations" has decreased from 4,2 to 3,5, which resulted from the appearance of labour unions and work councils in the majority of the researched subsidiaries. Although in the majority of subsidiaries the relationships were cooperative, there were some cases of minor demonstrations or difficult wage negotiations. Finally, in terms of (20) "Grievance procedure", there was virtually no change as the score shifted from 3,3 to 3,5. This indicated a small improvement in the on-going solving of employees' claims, however the majority of companies utilized more formal channels such as HR department, grievance boxes, and satisfaction surveys.

Group VI: Parent–Subsidiary Relations

The final group of criteria related to parent-subsidiary relation presents a curious mixture of management localization and sustained strategic control. The score for (21) "Ratio of Japanese expatriates", which in 2003 was merely 1,7 in 2017, decreased even further to 1,2. This means that in the majority of companies the ratio of Japanese managers was 1% or less. At the same time, the score for (22) "Delegation of authority" decreased only

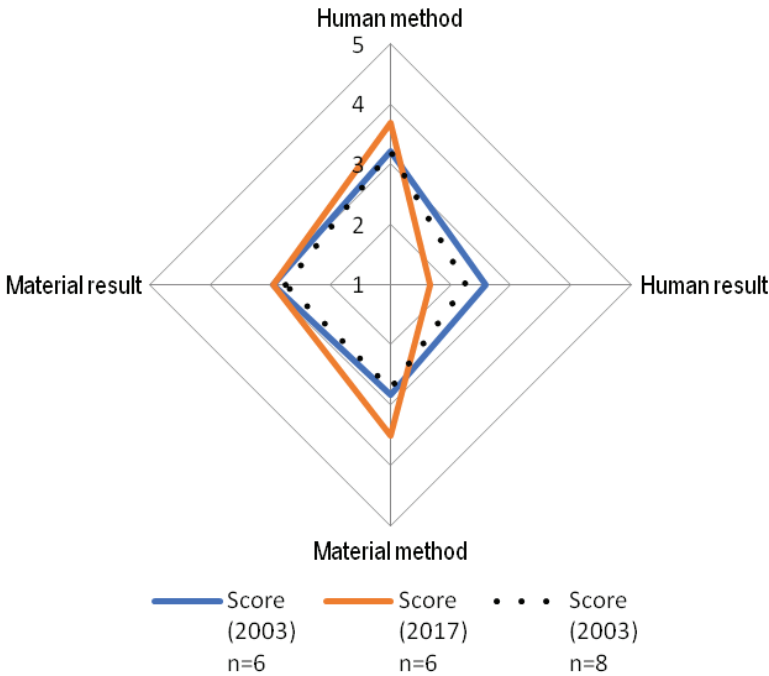
slightly from 3,3 to 3,0, which meant that, despite long years of operations, subsidiaries were still dependent on Japanese or regional HQ in terms of R&D, production technology, procurement scheduling, sales and delivery, and major investments that needed to be approved by Japan. This was also related to (23) "Position of local managers" in which the score changed from 3,5 to 2,2. In reality, it meant that all major positions were occupied by local managers, while Japanese expatriates occupied only some of the top positions. Although that was the case in many subsidiaries, in those where the CEO was local, Japanese were still present in the semi-official roles of advisors, responsible for the coordination, maintaining the relationship with HQ. Due to the strategic reliance on HQ and access to information, Japanese expatriates still had the upper hand in terms of management. Interestingly, some subsidiaries had negative experiences with over-localization of management and decided to bring back Japanese expatriates to improve the labour relations.

Findings concerning change in 4 perspectives

Results discussed above can be viewed using the 4-Perspective Evaluation, which is an alternative tool for analysing the degree of hybridization in the studied subsidiaries focusing on the "method" and "results" of application of "human" and "material" elements (Abo, 1994). The "material-results" and "human-results" aspects refer to directly bringing-in sets of production equipment, or directly dispatching trained employees from Japan to the local subsidiaries. In contrast, "material-method" and "human-method" refer to the application of the material and human management methods, which are themselves characteristic of the Japanese style management and production system. The significance of the 4-Perspective Evaluation lies in its ability to distinguish between whether a firm puts priority upon transplanting the methods of the Japanese management and production system by the means of bringing in Japanese expatriates and equipment or

rather by developing an independent and self-reliant local operation. Figure 2 summarizes the change that has occurred in these aspects.

Figure 2. Summary of change in 4 perspective evaluation



Source: own elaboration based on the results of analysis.

First of all, results indicate that subsidiary employment practices were gradually developed and employees acquired skills necessary in order to support the traditional Japanese-style manufacturing as the score in 'Human method' changed from 3,22 to 3,68. Second of all, the scores in 'Material method' changed from 2,83 to 3,50, which indicates that a progress has been achieved in terms of maintenance, quality control and procurement methods. The score in 'Human result', which changed from 2,58 to 1,67 indicates that this has been achieved despite decreased involvement of Japanese expa-

trates, which indicates that subsidiary became increasingly self reliant and that the Japanese system became rooted in local context of the subsidiary. As mentioned earlier, due to long-term nature of the equipment investments and complex yet relatively stable nature of the supplier arrangements the score for 'Material result' remained virtually unchanged on the 2,94 level.

Discussion: Measuring Change in 'Hybrid Factories'

This study is the first rigorous, longitudinal replication of JMNESG studies reporting on the changes that took place over time on a subsidiary level. In line with our expectations and previous studies (Cho, 1994; Fujimoto, 1999; Giroud, 2015) we found that Japanese hybrid factories are susceptible to change over time, which is focused on development of organizational capabilities in the area of manufacturing accompanied by the decreasing involvement of Japanese expatriate staff. In the light of convergence-divergence debate (Pudelko, 2005), our findings produce mixed results, which confirm a mixture of convergence and divergence, at the same time making the case for the notion of hybridization. Although we have found that, on average, subsidiary routines in the majority of areas tended to converge with the classically defined Japanese management or flexible manufacturing techniques (McDuffie & Pil, 1999), some practices diverged in rather unpredictable ways, depending on the short-term volatility of the labour market and supply chains, changes in the strategic role of the subsidiary, or development of new services and IT tools. There were also areas such as equipment, strategic role of the subsidiary, organizational culture, employment practices and relationships with suppliers, that remained quite stable over time. In the context of cultural differences between Japan and Poland we found that Polish culture might somewhat impede developments in terms of small-group activities and strong sense of unity. In addition, we found some variance in the degree of change between the subsidiaries, which could only partially be explained by the industry or

mode of investments. Interestingly, our findings are somewhat contrary to the ethnocentric tendencies of Japanese companies pointed out by the literature (Kopp, 1994; Keeley, 2001; Froese & Kishi, 2013). Subsidiaries in Poland since their inception tended to press for the localization of management, giving as a reason the need to cut the costs or the limited number of expatriates available growing number of subsidiaries. Our findings offer some interesting insights concerning external internationalization of Japanese subsidiaries as local managers were becoming increasingly involved in the global pool of human resources through largely inpatriation and to a much lesser extent as bridge individuals (Sekiguchi, et al. 2016). Interestingly enough we found that extreme or too rapid localization brought about some problems related to local managers abusing their authority. Consequently, the minimum levels of Japanese expatriate presence were maintained. These expatriates were also necessary to avoid breaking the link of cooperation with the Japanese mother companies which tended to restrain strategic maturity of the subsidiaries by maintaining reliance in terms of planning, purchasing, R&D and technological. This strategic reliance may be an important impeding factor when considering the progress that 'hybrid' factories make over time (Giroud, 2015; Strange & Kawai, 2015).

Our second contribution was related to combining JMNESG methodology with the most recent developments in research methods. By clarifying the origins of the hybrid study we have found that the key concerns about the JMNESG study result from the misunderstanding about its underlying paradigm. While the Abo's research began as an exploration of socio-cultural contextual differences between Japan and the USA (Abo, 1994), due to quantitative way of presenting its results it gradually came to be associated with the positivist paradigm and narrowly treated as a quantitative measure of Japanese management transfer to worldwide locations (Abo, 2007). In this article, we argue that the approach to JMNESG methodology fits well with the pragmatic paradigm, which accounts for combination of qualitative and quantitative ways of inquiry. Although the future of hybridization studies,

application-adaption model and 23-criteria requires an in-depth debate especially in light of the constant changes both in the global and Japanese manufacturing practices, there is no doubt that, JMNESG studies represent one of the biggest and richest studies, while the twenty-three criteria provide a valuable measuring tool and tracking device of the change occurring in each of the Japanese subsidiaries over the world. Consequently, this article shows how to combine the original JMNESG methodology with the most recent developments in qualitative research including mixed methods (Creswell & Clark, 2007; Edmonds & Kennedy, 2016), IB case studies (Mar-schan-Piekkari & Welch, 2011), longitudinal research (Hassett & Paavilain-en-Mäntymäki, 2013) and qualitative coding techniques (Saldana, 2015). We found that 23-criteria provide great tool for structuring both interviews and observation, while offering a holistic overview of the subsidiary. The clarity and reliability of data collection and analysis was improved through research protocols, codifying inter-subjectivity, interview and discussion recording, triangulation, and qualitative coding methods, which help to maintain the chain of evidence between the results and data. In our view, by applying these research methods, the transparency, reliability, and replication potential of JMNESG hybridization studies could be significantly improved and they can continue providing a wealth of insight into the changing nature of Japanese hybrid factories.

Limitations and Future Research

This study is not without certain limitations, which can be addressed in future studies.

First of all, we have conducted our empirical study on the Japanese subsidiaries in Poland and thus, our findings are bounded by the narrow context of a single country (Cieślak & Ryan, 2002; Cieślak & Kaćiak, 2011). The context of a single host country does not permit comparative analysis between countries in the search of potential socio-cultural differences.

Further studies could however replicate the studies conducted by JMNESG researchers in Hungary, Czech Republic and Slovakia, thus providing further interesting comparative insights about the nature of change in the hybrid factories operating in CEE countries.

For the sake of methodological rigour, this study utilized the original criteria (Yuan, 2006; Abo, 2007) and does not discuss the change that took place both in the nature of Japanese management and in the shape of local routines over the last 20 years. The discussion about these changes lies far beyond the scope of this article.

As far as the longitudinal methodology is concerned the measurement of reality was conducted in two points in time, based on data separate from the interpretations of the respondents, however the interpretations concerning the reasons for the process of change were obtained directly from the respondents based on retrospective interviewing techniques and are, therefore, subjected to recall and spoiler effects (Van de Ven & Huber, 1990; Golden 1997). In order to limit these biases, both respondent and source triangulation was used (Yin, 2009).

Conclusion

This study illustrates how the mixture of management practices utilized by Japanese manufacturing subsidiaries in Poland changed over time. It represents the first rigorous longitudinal replication of hybridization studies, conducted using the original methodology of Japanese Multinational Enterprise Study Group. The main objective of the article was to measure change at the subsidiary-level using JMNESG methodology and providing an example of a replication study, which could serve as benchmark for future replications. Although this study constitutes merely a first, modest step in a much broader discussion about the future of JMNESG studies and hybridization debate, we believe that addressing the issues raised in this article will allow more fruitful studies of studying the past and future of Japanese business.

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