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Strategy and Management Behavior of Medical Malls: Focusing on Competition over Location and Clinical Departments

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Abstract

Clinics across Japan are competing for location and clinical department. As an example of this phenomenon, medical malls have recently been developed throughout Japan. In this study, we conducted a comprehensive survey of medical malls in Japan, focusing on location and competition in clinical departments, and then analyzed their strategies and management behavior. First, we identified 2,501 medical malls, 9,539 clinics, and 1,869 pharmacies. Of the medical malls, 80% were located in Tokyo, Kanagawa, Osaka, Hyogo, Chiba, Hokkaido, and Saitama Prefectures. Second, multiple regression analysis was conducted to examine whether the medical malls' location choice was based on strategic behavior. Population density had an affected but not related to hospital location. Third, we analyzed the growth rate of 33 clinical departments from 2008 to 2019 in order to clarify the increasing effect of medical mall clinical departments. As a result, 28 clinical departments including gastroenterology, allergy, pediatric dentistry, rehabilitation, orthodontics, etc. increased remarkably. In light of the above, it can be said that medical malls are strategically clustered in urban areas with high population density and good access to transportation and living. In addition, these specialists may differentiate themselves from those in existing clinics by operating within a medical mall. These findings point to the existence of inter-clinic competition.

Key words

Medical Mall, Clusters of Clinics, Strategy and Management Behavior, Competition over Location and Clinical Department, Complete Survey

(1) Introduction

1. Identification of the problem

In recent years, amid the globalization of the economy and advancement of countries toward an information society, geographical advantage in economic activities has become less important than in the past. However, the phenomenon known as “clusters,” in which firms are concentrated in specific regions, has

been pointed out in the field of management studies as a paradox to this trend. These issues are an important theme in the study of competitive strategy, regardless of industry (Porter, 1998).

Clusters are geographic concentrations of interconnected firms and institutions in a particular field (Porter, 1998). In Japan, clusters specializing in specific industries have been

identified throughout the country (Yamawaki, 2002). In particular, they are said to contribute significantly to the competitiveness of Japanese firms and to economic development (Jankowiak, 2011). Meanwhile, to ensure equitable access to health care in Japan, the government has set a policy of uniformity in the supply of health care by defining medical areas based on the medical plans of each prefecture. Therefore, the number of hospitals and doctors per population is, to an extent, evenly distributed as far as the county level is concerned. In addition, recent advances in ICT have improved access to health care, making location less advantageous than in the past.

Furthermore, Health care is known as an industry where the principle of competition does not work and the market mechanism does not function effectively (Akerlof, 1970). As such, health care clusters are unlikely to be formed. However, does this premise apply to medical care clinics in Japan? In principle, the domestic medical market is regulated under the public medical insurance system, which does not allow price competition. Given that the number of hospitals and beds is regulated in the regional medical care plans of each prefecture, there is little freedom in management compared with ordinary companies (Matsuda, 2019).

However, the market environment for clinics is vastly different. For example, since most clinics have no beds, the initial cost to open them is low compared with hospitals with a hospitalization function, and the barriers to entry are likewise low. Therefore, doctors can freely open clinics in any region, and except for anesthesiologists, they can profess to be the majority of clinics.

In recent years, the number of clinics nationwide, including dental, has reached

170,000 (Ministry of Health, Labour and Welfare, 2014). In other words, the clinic market is saturated, with clinics having to compete for location and departments (Yoshida and Kohno, 2007). One example of this phenomenon is the medical mall, which is a cluster of clinics strategically formed to give specialists a competitive advantage. In Japan, SL Medical Group was established in Nagoya City, Aichi Prefecture, in 1972. However, if there is no competition, then how can the formation of these clusters of clinics be explained? The answer to this question is not self-evident and is therefore open to debate.

A medical mall is not a medical facility as defined by the Medical Care Act; rather, it is generally an establishment where multiple clinics and pharmacies are concentrated in a specific space (Ito, 2020). Health care management in Japan is generally inefficient, and labor productivity is low, because management is strongly regulated to ensure quality, reliability, and safety. In particular, clinics are significantly less efficient and productive than hospitals because they are primarily run by a single doctor. Moreover, medical practitioners are not trained in management, and their knowledge in this area tends to be poor. However, medical malls often involve multiple clinics and pharmacies, plus a consulting organization that provides management support for handling issues in public relations, finance, accounting, organization, and facilities. Medical mall practitioners receive management support from this organization, which allows for division of function and collaboration, thus improving the quality and efficiency of clinics. As the quality of health care improves, costs can be controlled (Porter and Teisberg, 2006). Therefore, medical

malls may be superior to existing clinics in terms of management.

Medical malls are advantageous to physicians, such as enabling the provision of high-quality medical care in a comprehensive manner and the sharing of expensive testing equipment by establishing a network system in which multiple physicians work together to practice group medical care. This is expected to improve ability to attract customers and profitability (Ito, 2014; Lin and Chen et al., 2006).

Meanwhile, users benefit from the plurality of clinical departments with high specialization, as in the outpatient department of a hospital. Therefore, users can access more highly specialized medical care more efficiently compared with other clinics (Bobbitt; 2011, Ito, 2016a)¹. Thus, if medical malls benefit both doctors and users through inter-clinic competition, there is some economic rationality to their operation (Hill and Hack, 1985). However, only 28.9% of medical malls are linked to one another, so the case may be that multiple clinics happen to be gathered in a specific space by chance (Ito, 2016b). To confirm the existence of competition among clinics, we sought to examine the strategy and management behavior of medical malls in terms of location and clinical departments.

2. Study objectives

Despite the accumulation of cluster research, the explanation and discourse are lacking regarding the actors and roles that have

supported the development of clusters (Motoyama, 2008). In particular, medical malls have emerged as clusters of clinics in the health care sector, but the role they play remains unclear. Clinics may form clusters as a strategic intention to gain advantages in the sector's competitive market environment. This is the research question of our present study.

Comprehensive discussion of inter-clinic competition is scarce. We assumed that if competition is working, the medical mall should act on a different strategy from existing clinics. For example, multiple specialists working together to practice group medical care have advantages that cannot be obtained through individual practice, such as a reduced burden on doctors and improved quality of medical care. Therefore, doctors operating their own clinics may consider forming a cluster (Zwiep et al., 2018). Meanwhile, if there is no competition, the behavior of the medical mall is the same as that of existing medical clinics; that is, the medical mall is merely a specific space that happened to have multiple clinics. In other words, the existence of competition is reflected in the location and clinical departments of the medical mall. Therefore, the purpose of our research was to clarify the strategies and management behavior unique to medical malls, paying attention to the location and clinical departments of distribution.

Regarding the actual number of medical malls in Japan, no official government statistics have been prepared. A survey by the Japan Institute of Management showed that 1,500

¹ Problems with medical malls have also been pointed out. One is that cooperation among doctors is difficult because of the large number clinics that are independent from management, which means

that transaction costs are incurred. Another is that malls are located in areas with high land prices, leading to high rental costs and the risk of increasing management burden unless a certain level of profit can be expected.

medical clinics were open in 2005, using four clinics as the unit of calculation, its estimate gave 375 locations (JMA Research Institute Inc., 2012). A later survey showed 418 locations (Ito, 2010). A survey conducted by Yano Research Institute in 2012 calculated two or more clinics into medical malls and found 925 locations. However, these surveys do not necessarily capture the population. As such, basic information on the national medical mall is necessary to shed light on the strategy and management behavior of the medical mall. Therefore, we attempted to uncover the medical mall by conducting a complete survey.

(2) Method

1. Survey method

The definition of group practice, which is commonly adopted in primary care in Western countries, was used as a reference, given the necessity to establish evaluation criteria for investigating medical malls. Group practice has been defined as follows:

Group practices were defined as being a medical practice with any specialisation where at least three physicians work together in a team (Josi and Pietro, 2019, p. 1).

Therefore, we defined the medical mall as a “location where three or more clinics, including dentists, are located in the same space.” In the United States, as of 2011, group medical care consists of more than 50 doctors, accounting for 35.6% of the total (Welch et al., 2013; Wald et al., 2018). In Japan, however, clinics are operated mainly by one doctor, and the minimum number of doctors in a medical mall is three.

If medical malls are viewed as the medical

version of shopping malls, then it is desirable to narrow the area of analysis, as competition for shopping malls is inherently occurring in a limited area. However, it is not clear whether the clustering of clinics is occurring in a specific area or is a phenomenon that is occurring across Japan. This must be considered because medical regions are, in principle, constrained by medical planning and, with the exception of Hokkaido and Nagano Prefectures, are defined based on prefectures. Further, since we collected statistics covering the number of medical malls in the country, we attempted to compare the number of medical malls by prefecture as a pilot study.

Next, using the database of medical facilities (WBS)² compiled by the Wellness Medical Information Center in November 2019, we confirmed the address, specifically the longitude and latitude, of the clinics and pharmacies in the same space. By doing so, we developed a directory for medical malls.

2. Analytical method

As mentioned earlier, clinics are more vulnerable to management than hospitals, but two strategies may give them an edge in this competitive environment, as shown in Table 1.

The first is the cluster strategy. The formation of these clusters is believed to increase productivity, access, and motivation, reduce transaction costs, and promote innovation (Porter, 1998). In the health care market, the larger the economy and the denser the population, the more intense the competition. For physicians to have a competitive advantage, they must provide patients with opportunities for efficient access.

² We have been provided with wellness data base

by WELLNESS.Co., Ltd.

Table 1 Competitive relationship between existing clinics and medical malls over location and clinical departments

Existence of competition	Medical facility	Location	Clinical department	Strategy
No	Clinic	<ul style="list-style-type: none"> • Proportional to population density but somewhat evenly distributed • Located near hospitals 	<ul style="list-style-type: none"> • Advocating internal medicine, pediatrics, surgery, etc. • Clinical department is the same between the clinics and medical malls 	<ul style="list-style-type: none"> • Adaptation to medical policy
	Medical mall			
Yes	Clinic	<ul style="list-style-type: none"> • Proportional to the population density + Equal distribution • Located near hospitals 	<ul style="list-style-type: none"> • Advocating internal medicine, pediatrics, surgery, etc. 	<ul style="list-style-type: none"> • Adaptation to medical policy • Comprehensive medical care strategy
	Medical mall	<ul style="list-style-type: none"> • Urban areas located in the economic zone • Located in a good space with access to traffic and living spaces 	<ul style="list-style-type: none"> • Advocating specialized clinical departments • Establishment centered on specialists 	<ul style="list-style-type: none"> • Cluster strategy • Differentiation strategy

Source: Compiled by author.

Therefore, it is reasonable for clinics to cluster strategically in the most convenient places for transportation and living spaces.

Indeed, if medical malls are acting strategically, they will be more biased of the location compared with existing clinics because they are located where patients prefer. Therefore, the existence of the cluster strategy can be verified by comparing the number of clinics, stations, and shopping centers, as well as population density and other related indicators in each prefecture with the number of medical malls (MM). However, because MM are not facilities defined by the Medical Care Act, and the permission to open a MM differs greatly depending on the prefecture, the presence of medical-related companies, such as medical management consultants (MC), pharmacies (Ph), and drug stores (DS), which have expertise in opening of MM, may influence the establishment of MM. Therefore, these factors were also considered.

The second strategy is differentiation. One of the benefits that can be gained from

clusters is specialization. When organizations within a cluster exhibit specialization and complement one another, they can maintain a competitive advantage as a whole (Yamawaki, 2002). Typically, Japanese medical practitioners have a wide range of medical abilities and careers as primary care physicians while practicing on-site in the front line, after working as hospital specialists. In recent years, to adapt to the policy trend in medical care, doctors have sought to strengthen the family doctor function and improve home medical care in support of discharged patients at hospitals. Consequently, the range of medical treatment offered is wide, and clinic management needs to be stable. Therefore, existing clinics tend to be located around hospitals, although they are evenly distributed in each prefecture (Yoshida and Kohno, 2007).

Meanwhile, securing a stable number of patients is difficult because the scope of medical care becomes narrower as specialists provide highly specialized medical care at clinics. However, given that medical malls are located

Table 2 Variables used

Variable	Abbreviation
Medical malls	MM
Clinics	C
Hospitals	H
Pharmacies	Ph
Drugstores	DS
Percentage of population aged over 65 years	P65
Population density	PD
Medical management consultant	MC
Station × shopping center	StSC
Percentage of clinical departments	Y_p
Growth rate of clinical departments	Y_d
Medical mall dummy	MD
2019 dummy	D19
DM × D19	DMD19

Source: Compiled by author.

in urban areas, particularly in areas with convenient transportation and residence, they are preferred by patients who need regular outpatient care (Pines and Mehrotra et al, 2013). Therefore, it is possible that a specialist could open a practice in a medical mall to attract more customers and differentiate itself from existing clinics. To confirm this fact, we needed to clarify the increase in number of clinical departments in the MM. In this study, the tendency that a specific clinical department is increasing in number in the MM was called the increase effect.

To test these hypotheses, we used the variables that could explain the competitive environment surrounding number of MM, as shown in Table 2. In addition, the following three analyses were performed. First, we

calculated the descriptive statistics after compiling data for each prefecture regarding the number of hospitals (H), number of clinics (C), including dental clinics, Ph, and DS, population density (PD), ratio of the population aged 65 years or older (P65), and intersection of the number of stations and number of shopping centers (StSC)³. An ABC analysis was also conducted to clarify the regional distribution of MM, C, and H.

Second, the model with MM as objective variables and C, PD, StSC, and MC as independent variables was set as 1). Multiple regression analysis was attempted by setting the model in which the objective variable was C and the independent variables were H, P65, PD, and MC as 2). Note that α is a constant term, and u is an error term.

$$MM = \alpha + \beta_1 C + \beta_2 PD + \beta_3 MC + \beta_4 StSC + u \quad 1)$$

$$C = \alpha + \beta_1 H + \beta_2 P65 + \beta_3 PD + \beta_4 MC + u \quad 2)$$

The medical facility data used this time were adjusted for the population of 100,000 to account for the large errors among prefectures. The correlation between the explanatory variables was confirmed beforehand, and variables with a positive correlation were selected. Moreover, if an endogenous problem was suspected, the instrumental variable

³ The number of hospitals and clinics (including dentistry) was collected from the Ministry of Health, Labour and Welfare's "Medical Facility Survey (2016)"; the number of pharmacies was collected from the Ministry of Health, Labour and Welfare's "Overview of Fiscal 2018 Health Administration Report"; the ratio of the population aged 65 years to the total population and the population density were collected from "2015 Census" of the Statistics Bureau, Ministry of

Internal Affairs and Communications; the number of stations was collected from "Ranking of prefectures with many stations in Japan"; the number of shopping malls was collected from Japan Shopping Center Association's "List of shopping centers by prefecture and municipality"; and the list of medical management consultants was collected from Japan Medical Management Consultants Association's "List of approved registered medical management consultants."

Table 3 Basic information of medical malls and other variables

Prefecture	Number of medical malls	Number of offices in medical mall	Number of all clinics in medical malls	Number of pharmacies in medical malls	Number of hospitals	Number of all clinics	Number of pharmacies
Hokkaido	118	579	489	90	562	6348	2323
Aomori	6	28	21	7	96	1432	615
Iwate	2	7	6	1	93	1490	590
Miyagi	33	160	131	29	139	2731	1159
Akita	5	24	20	4	69	1254	531
Yamagata	0	0	0	0	68	1420	587
Fukushima	2	7	6	1	128	2233	874
Ibaraki	14	63	52	11	178	3115	1295
Tochigi	6	22	20	2	107	2413	892
Gunma	3	13	11	2	129	2538	903
Saitama	114	518	434	84	342	7771	2888
Chiba	134	609	494	115	286	7034	2448
Tokyo	667	2913	2450	463	651	23842	6702
Kanagawa	392	1807	1508	299	341	11700	3888
Niigata	10	39	32	7	131	2856	1142
Toyama	1	4	3	1	106	1211	456
Ishikawa	4	16	12	4	95	1353	528
Fukui	2	6	6	0	68	873	293
Yamanashi	1	4	3	1	60	1139	451
Nagano	3	11	9	2	130	2592	979
Gifu	9	31	27	4	102	2549	1032
Shizuoka	15	71	57	14	181	4494	1857
Aichi	72	345	293	52	323	9005	3368
Mie	7	27	22	5	100	2373	820
Shiga	10	48	37	11	57	1620	611
Kyoto	27	119	100	19	170	3784	1085
Osaka	339	1566	1325	241	523	13940	4170
Hyogo	219	1058	876	182	350	8044	2640
Nara	38	181	148	33	77	1897	558
Wakayama	8	29	26	3	83	1603	488
Tottori	0	0	0	0	44	760	276
Shimane	2	7	6	1	51	998	333
Okayama	11	50	41	9	164	2661	831
Hiroshima	77	378	314	64	244	4138	1615
Yamaguchi	3	11	10	1	147	1962	801
Tokushima	1	3	3	0	112	1177	390
Kagawa	8	40	32	8	90	1308	539
Ehime	0	0	0	0	141	1937	602
Kochi	4	26	22	4	130	935	391
Fukuoka	88	403	333	70	461	7749	2914
Saga	1	4	4	0	107	1112	519
Nagasaki	19	75	66	9	151	2128	738
Kumamoto	1	3	3	0	212	2305	856
Oita	4	16	13	3	157	1505	573
Miyazaki	1	4	3	1	140	1399	602
Kagoshima	4	15	12	3	252	2230	890
Okinawa	16	68	59	9	94	1511	570
Nationwide	2501	11408	9539	1869	8442	170469	59613

Note: Display the survey results of 47 prefectures. The numbers are real data.

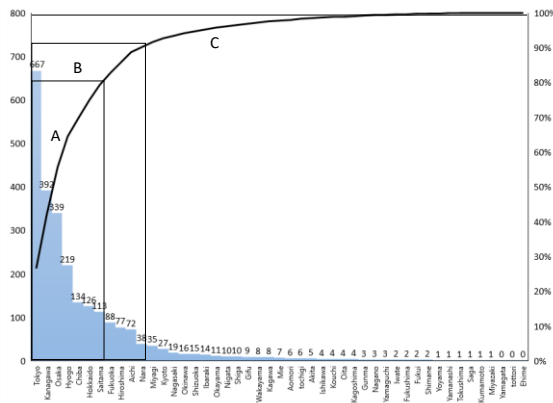


Figure 1 Pareto chart of medical malls (ABC analysis)

Note: A = Tokyo, Kanagawa, Osaka, Hyogo, Chiba, Hokkaido, and Saitama. B = A + Fukuoka, Aichi, and Hiroshima. C = Prefectures other than A and B.

method (2SLS) was adopted in addition to the least squares method.

Third, we used a difference-in-differences design (DID) using regression analysis to verify the increasing effect of clinical departments in medical malls. By subtracting the growth rate of clinical departments in all clinics from that of clinical departments in medical malls from 2008 to 2019, we clarified the effect of the increasing number of clinical departments in medical malls.

In implementing DID, the following two conditions had to be satisfied. First, the trend for the number of entries in the clinic and medical mall groups had to be the same. Second, no other changes should be affecting the number of entries in the clinic and medical mall groups. Both trends were the same, and no specific events had affected the increase or decrease in the number of clinics in the country as a whole. Thus, we deemed these conditions to have been cleared.

Based on the above, the model in which the ratio of clinical departments (Y_p) could be

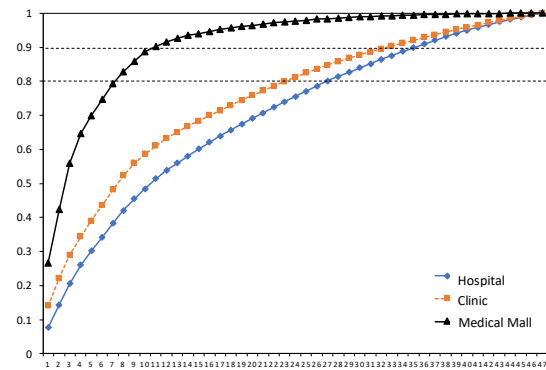


Figure 2 Pareto chart of hospitals, all clinics, and medical malls

Note 1: The cumulative frequency distribution of hospitals and all clinics has been added to the ABC analysis of the Medical Mall Criteria.

Note 2: All clinics = general clinics + dental clinics.

used as the objective variable and DM, D19, and DMD19 as the independent variables was set, shown in Equation 3). We ran multiple regression analysis using an equation 4) in which the objective variable was the rate of change (Y_d) in the clinical department and the independent variable was DM.

$$Y_p = \alpha + \beta_1 DM + \beta_2 D19 + \beta_3 DMD19 + u \quad (3)$$

$$Y_d = \alpha + \beta_1 DM + u \quad (4)$$

(3) Results

1. Basic Information and Regional Distribution of Medical Malls

First, the results of the survey on the number of medical malls are shown in Table 3. We identified 2,501 medical malls in Japan, and it was found that there are 11,408 business establishments. Of these establishments, 9,539 were clinics and 1,869 were pharmacies. For an overview of the prefectural distribution, the descriptive statistics are shown in Table 4. The average number of medical malls in each

Table 4 Descriptive statistics on the number of medical institutions

	Number of medical malls	Number of offices in medical mall	Number of all clinics in medical malls	Number of pharmacies in medical malls	Number of hospitals	Number of all clinics	Number of pharmacies
n	47	47	47	47	47	47	47
Average	53.21	242.72	202.96	39.77	179.62	3627.00	1268.36
Standard deviation	123.11	552.83	463.98	88.96	139.91	4209.76	1267.12
Min	0.00	0.00	0.00	0.00	44.00	760.00	276.00
Max	667.00	2913.00	2450.00	463.00	651.00	23842.00	6702.00
Median	7.00	28.00	22.00	4.00	130.00	2230.00	820.00
Coefficient variation	2.31	2.28	2.29	2.24	0.78	1.16	1.00

Note: Display the survey results of 47 prefectures.

prefecture was 53.21, the standard deviation was 123.11, and the minimum value was 0. The maximum value was 667, in Tokyo. The average number of establishments in a medical mall was 242.72, with a standard deviation of 552.83, a maximum of 2,913, and a minimum of 0.

Second, the results of the ABC analysis of the number of medical malls by prefecture are shown in Figure 1. Of the medical malls corresponding to A, 80% were concentrated in Tokyo, Kanagawa, Osaka, Hyogo, Chiba, Hokkaido, and Saitama Prefectures. To examine the degree of bias in the location of medical malls compared with hospitals and clinics, we investigated the location distribution of three medical facilities, with the results shown in Figure 2. The Pareto chart in Figure 2 shows that the closer the distribution is to the 45-degree line, the smaller the distribution, whereas the farther the distribution is from the 45-degree line to the left, the larger the distribution. The coefficients of variation, as shown in Table 4, namely, 2.31 for medical malls, 0.78 for hospitals, and 1.16 for all clinics, suggested that the location variation of medical malls was three and two times greater than that of hospitals and clinics, respectively.

2. Factors associated with the location of medical malls

The data used this time had large errors between prefectures. Thus, we corrected the data in advance of the multiple regression analysis. Basic information adjusted to the population of 100,000 was prepared and presented in the Table 5. The descriptive statistics are shown in Table 6 and the correlation analysis is shown in Table 7. In Table 7, three variables, namely, PD, MC, and StSC, were positively correlated with MM, whereas five variables, namely, H, Ph, P65, PD, and MC, were positively correlated with C. However, PD, MC, and StSC were positively correlated with one another. P65 was negatively correlated with PD, MC, and StSC.

The results of the trial of 2SLS in addition to OLS are shown in Table 8. Model 1) used the least squares method to estimate the explanatory variables associated with MM, but Constant term, C, PD, MC, and StSC were statistically significant with a degree of freedom adjusted coefficient of determination of 0.650. However, as this coefficient may be overestimated, model 1)' was estimated using 2SLS. In the results, only PD was statistically significant, and the degree of freedom adjusted

Table 5 Number of medical institutions per 100,000 population by prefecture

Prefecture	MM	H	C	Ph	DS	P65	PD	MC	StSC
Hokkaido	2.22	10.59	119.60	43.90	12.79	29.1	69.00	66	86296
Aomori	0.46	7.36	109.84	48.70	11.66	30.1	136.00	7	4611
Iwate	0.16	7.39	118.46	47.50	14.23	30.4	84.00	9	7486
Miyagi	1.44	6.06	119.15	50.00	11.95	25.7	321.00	26	11993
Akita	0.49	6.82	124.00	54.10	11.47	33.8	88.00	5	4410
Fukushima	0.10	6.71	117.10	46.90	9.86	28.7	139.00	18	8550
Ibaraki	0.48	6.16	107.82	45.00	12.25	26.8	478.00	7	9248
Tochigi	0.31	5.50	123.94	45.80	12.07	25.9	308.00	21	3658
Gunma	0.15	6.66	131.02	46.30	14.66	27.6	310.00	23	4692
Saitama	1.58	4.75	107.95	39.40	13.85	24.8	1913.00	32	31787
Chiba	2.18	4.65	114.27	39.10	12.48	25.9	1207.00	25	51597
Tokyo	5.09	4.96	181.78	48.50	12.99	22.7	6169.00	452	235893
Kanagawa	4.37	3.80	130.39	42.40	11.57	23.9	3778.00	54	76383
Niigata	0.44	5.78	126.05	50.80	13.42	29.9	183.00	25	12390
Toyama	0.09	10.07	115.02	43.40	14.44	30.5	251.00	18	8448
Ishikawa	0.35	8.36	119.02	46.20	14.34	27.9	276.00	29	3542
Fukui	0.26	8.75	112.31	37.90	15.82	28.6	188.00	8	3120
Yamanashi	0.12	7.28	138.27	55.20	16.63	28.4	187.00	6	1606
Nagano	0.14	6.25	124.55	47.50	10.72	30.1	155.00	41	13250
Gifu	0.45	5.09	127.12	51.70	19.60	28.1	191.00	15	12342
Shizuoka	0.41	4.94	122.78	50.80	12.76	27.8	476.00	32	14820
Aichi	0.98	4.41	123.08	44.70	12.57	23.8	1447.00	73	118286
Mie	0.39	5.60	132.82	45.80	12.82	27.9	315.00	11	13630
Shiga	0.72	4.09	116.29	43.30	12.99	24.2	352.00	7	6250
Kyoto	1.08	6.78	150.99	41.90	11.41	27.5	566.00	28	15376
Osaka	3.93	6.06	161.51	47.30	10.60	26.1	4640.00	146	121068
Hyogo	3.99	6.38	146.64	48.10	10.68	27.1	659.00	46	70485
Nara	2.79	5.66	139.49	41.70	8.90	28.7	370.00	12	4192
Wakayama	0.83	8.57	165.47	52.20	8.26	30.9	204.00	0	2500
Shimane	0.29	7.46	146.01	49.00	10.24	32.5	104.00	5	2124
Okayama	0.58	8.65	140.42	43.80	9.29	28.7	270.00	30	8183
Hiroshima	2.75	8.71	147.76	57.30	10.39	27.5	335.00	84	21238
Yamaguchi	0.22	10.65	142.09	58.50	13.18	32.1	230.00	19	7020
Tokushima	0.13	14.90	156.55	53.00	9.98	31	182.00	16	1155
Kagawa	0.81	9.17	133.24	56.00	12.12	29.9	520.00	22	2346
Kochi	0.55	18.03	129.68	55.40	11.37	32.8	103.00	7	2768
Fukuoka	1.74	9.11	153.15	57.10	13.36	25.9	1023.00	123	44982
Saga	0.12	12.93	134.36	63.40	10.51	27.7	341.00	43	1296
Nagasaki	1.39	11.03	155.43	55.00	8.55	29.6	333.00	33	3944
Kumamoto	0.06	11.94	129.80	48.70	9.80	28.8	241.00	42	8150
Oita	0.35	13.57	130.05	50.10	10.37	30.4	184.00	24	2523
Miyazaki	0.09	12.65	126.46	55.70	10.94	29.5	143.00	13	1368
Kagoshima	0.24	15.30	135.40	55.10	11.66	29.4	179.00	38	2772
Okinawa	1.10	6.46	103.77	39.40	4.19	19.6	628.00	18	600

Note: It was excluded because there are no medical malls in Yamagata, Tottori, and Ehime.

Table 6 Descriptive statistics on the number of medical institutions per 100,000 population by prefecture

	MM	H	C	Ph	DS	P65	PD	MC	StSC
n	44	44	44	44	44	44	44	44	44
Average	1.06	8.09	131.61	48.72	11.90	28.14	688.09	39.9773	24281.32
Standard deviation	1.27	3.30	16.99	5.90	2.49	2.80	1228.34	70.0885	44382.50
Min	0.06	3.80	103.77	37.90	4.19	19.60	69.00	0.00	600.00
Max	5.09	18.03	181.78	63.40	19.60	33.80	6169.00	452.00	235893.00
Median	0.47	7.05	129.74	48.30	11.81	28.50	292.00	23.50	7818.00
Coefficient variation	1.21	0.41	0.13	0.12	0.21	0.10	1.79	1.75	1.83

Note: It was excluded because there are no medical malls in Yamagata, Tottori, and Ehime.

Table 7 Correlation matrix

	MM	H	C	Ph	DS	P65	PD	MC	StSC
MM	1								
H	-0.4359**	1							
C	0.1962	0.2750	1						
Ph	-0.2528	0.5484**	0.4874**	1					
DS	-0.1250	-0.2765	-0.3467*	-0.1117	1				
P65	-0.5067**	0.6501**	0.1474	0.4452**	-0.1737	1			
PD	0.6141**	-0.5301**	0.1459	-0.3116*	0.0241	-0.8045**	1		
MC	0.3897**	-0.0783	0.2777	0.0056	-0.0606	-0.4764**	0.5169**	1	
StSC	0.5498**	-0.5697**	-0.0011	-0.3317*	0.2653	-0.4908**	0.4698**	0.6058**	1

Note: Tests for rank correlation coefficients, * P < 0.05, ** P < 0.01.

coefficient of determination was 0.408. In addition, in 1)', Constant term and PD were significant, and the freedom adjusted coefficient of determination was 0.599, suggesting that 1)' would be suitable and affected by population density.

Model 2) then used the least squares method to estimate the explanatory variables associated with C; Constant term, P65, and MC were statistically significant with a degree of freedom adjusted coefficient of determination of 0.3990. In calculating model 2)', which employed 2SLS to address endogeneity, three variables were statistically significant, namely, Constant term, H, and PD, and the degree of freedom adjusted coefficient of determination was 0.2056.

Therefore, although medical malls and existing clinics are commonly affected by population density, they differ in that only clinics are affected by the location of hospitals.

3. Increasing effect of clinical departments in medical malls

Table 9 shows the results of DID in which multiple regression analysis was attempted to verify the effect of increasing the number of clinical departments in a medical mall. In model 3), DM was statistically significant but the parameter was negative. This was because the proportion of clinical departments was low overall owing itself to the overwhelmingly smaller number of medical malls compared with the number of existing

Table 8 Results of multiple regression analysis

Objective variable	MM			C	
	1)	1')	1")	2)	2)'
	OLS	2SLS	2SLS	OLS	2SLS
H				0.655605 (0.749156)	5.470** (1.567)
C	0.01454† (0.008248)	-0.0345 (0.02912)			
PD	0.0004979* (0.0001934)	0.001153** (0.0002624)	0.0009006** (0.0001157)	0.00314497 (0.00318154)	0.01202** (0.003104)
P65				2.31193* (0.952345)	
MC	-0.006847† (0.003888)			0.130861* (0.0516788)	
StSC	1.748e-05* (6.499e-06)				
Const	-1.3510 (1.051)	4.8060 (3.6920)	0.4359** (0.1464)	53.8455** (25.4512)	79.08** (14.23)
Adj. R ²	0.650	0.408	0.599	0.399075	0.2056
lnL	-47.370	-671.200		-173.199	
n	44	44	44	44	44
Hausman Test		8.20754 (0.0165103)	3.02738 (0.08187)		20.7165 (3.17293e-005)
Sargan Test			2.59189 (0.107412)		0.00270829 (0.998647)
IV List		Const, StSC, MC	Const, StSC, MC		Const, StSC, MC, P65, Ph

Note: **p < 0.01%, *p < 0.05%, †p < 0.10%. Numbers in parentheses are standard errors.

clinics.

The proportion of clinical departments was also generally low because the number of medical malls was overwhelmingly smaller than that of existing clinics. Further analysis of the growth rate (difference) of DM showed statistical significance. The growth rate of clinical departments in medical malls increased an average of 3.41% over the past 11 years, even after excluding the effect of the growth rate of clinical departments in all clinics. As shown in Table 10, there was an increase in 28 out of 33 fields in the number of clinical departments of medical malls, with large increases in the following: 9.01% in gastroenterology, 8.92% in allergology, 8.93% in pediatric dentistry, 8.28% in rehabilitation, and 8.43% in orthodontics. Meanwhile, decreases were recorded in five

fields: obstetrics and gynecology (-4.76%), pediatrics (-1.51%), otorhinology (-1.37%), diabetes medicine (-1.57%), and breast surgery

Table 9 Results of regression analysis

	3)	4)
	OLS	OLS
DM	-0.0368820* (0.0192202)	0.0341241** (0.00688930)
D19	0.0018300 (0.0192202)	
DMD19	0.0306549 (0.0271815)	
Const	0.0673062** (0.0135907)	0.0008 (0.00487147)
Adj. R ²	0.018	0.237
lnL	151.346	143.389
n	132	66

Note: **p < 0.01%, *p < 0.05%. Numbers shown in parentheses are standard errors.

Table 10 Increasing effect of clinical departments in medical malls (difference-in-differences design)

Clinical department	Clinics (%)			Medical malls (%)			Difference in differences
	2008	2019	Difference	2008	2019	Difference	
Gastroenterology	11.45	10.33	-1.11	2.40	10.30	7.90	9.01
Allergy	3.78	3.95	0.18	0.00	9.10	9.10	8.92
Pediatric dentistry	23.18	25.15	1.97	0.00	10.90	10.90	8.93
Physical medicine and rehabilitation	7.53	6.66	-0.88	0.00	7.40	7.40	8.28
Orthodontic dentistry	12.72	13.89	1.17	0.00	9.60	9.60	8.43
Internal medicine	37.77	36.75	-1.02	20.00	26.60	6.60	7.62
Dermatology	7.44	6.55	-0.89	7.00	13.10	6.10	6.99
General surgery	9.16	7.49	-1.67	1.00	5.80	4.80	6.47
Psychosomatic medicine	2.26	2.52	0.26	0.00	6.70	6.70	6.44
Oral and maxillofacial surgery	11.85	15.15	3.30	0.00	9.10	9.10	5.80
Cardiology	7.77	7.44	-0.32	1.00	6.40	5.40	5.72
Psychiatry	3.37	3.72	0.35	2.00	6.80	4.80	4.45
Respiratory medicine	4.66	4.45	-0.21	0.00	3.90	3.90	4.11
Dentistry	39.81	39.02	-0.78	16.00	19.40	3.40	4.18
Rheumatology	2.42	2.42	-0.01	0.00	3.90	3.90	3.91
Gynecology	1.28	0.92	-0.36	0.00	3.10	3.10	3.46
Ophthalmology	5.02	4.30	-0.72	8.00	10.90	2.90	3.62
Colorectal surgery	2.12	1.76	-0.37	0.00	1.90	1.90	2.27
Radiology	2.98	1.93	-1.05	0.40	1.50	1.10	2.15
Aesthetic plastic surgery	0.59	0.59	0.00	0.40	2.60	2.20	2.20
Orthopedic surgery	7.74	7.11	-0.63	7.00	8.40	1.40	2.03
Neurology	2.03	1.65	-0.38	0.40	1.90	1.50	1.88
Plastic and reconstructive surgery	1.11	1.01	-0.10	2.00	3.70	1.70	1.80
Neurosurgery	0.94	1.01	0.07	0.00	1.30	1.30	1.23
Obstetrics	0.24	0.16	-0.08	0.00	0.90	0.90	0.98
Urology	2.32	2.03	-0.29	3.00	3.60	0.60	0.89
Anesthesiology	1.36	1.12	-0.24	1.00	1.40	0.40	0.64
Pediatric surgery	0.20	0.21	0.01	0.00	0.10	0.10	0.09
Breast surgery	0.22	0.48	0.26	0.40	0.00	-0.40	-0.66
Endocrinology and metabolism	1.14	2.31	1.17	0.40	0.00	-0.40	-1.57
Otorhinolaryngology	3.51	3.08	-0.43	9.00	7.20	-1.80	-1.37
Pediatrics	13.47	11.28	-2.19	12.00	8.30	-3.70	-1.51
Obstetrics and gynecology	2.12	1.68	-0.44	7.00	1.80	-5.20	-4.76
Overall average	7.08	6.91	-0.16	3.04	6.29	3.25	3.41

Note: We targeted 33 clinical departments that can capture data from clinical departments in medical malls.

(-0.66%).

(4) Discussion

We focused on inter-clinic competition and analyzed the location and distribution of clinical departments in medical malls and existing clinics.

First, through a thorough survey of medical malls, we uncovered the fact that clusters of clinics were formed around Japan's

leading economic zones. As of November 2019, Japan had 2,501 medical malls, with 11,408 business establishments operating in them (Table 3). Of these establishments, 9,539 were clinics, including dentists, and 1,869 were pharmacies, accounting for 5.6% of all clinics and 3.1% of all pharmacies in the country.

In addition, we conducted an ABC analysis on the number of medical malls by prefecture to clarify the location distribution of

these malls. The results showed that 80% were located in prefectures with large economies, such as Tokyo, Kanagawa, Osaka, Hyogo, Chiba, Hokkaido, and Saitama. The distribution of locations was clearly biased compared with the existing clinics (Figs. 1 and 2). As discussed above, clusters of clinics can be interpreted as occurring mainly in urban areas rather than equally across the country. Given that medical malls are opening without government subsidies, medical malls may have economic rationale and may offer incentives to attract physicians within these areas.

Second, our analysis of the factors influencing the number of medical malls suggests that the magnitude of the population density is related to the number of malls. To examine whether the location of a medical mall was accidental or a consequence of strategic behavior, we ran a multiple regression analysis on factors related to the number of medical malls. The results suggested that both medical malls and existing clinics were affected by population density, whereas existing clinics were also affected by the location of hospitals (Table 8). Thus, although the impact of population density on both medical malls and existing clinics is only a natural consequence, medical malls are not affected by the location of hospitals.

Recently, to cope with the aging of the population, the Japanese government has been shifting its strategy to the provision of comprehensive medical care by many clinics. It has been giving incentives for medical treatment fees with the aim of strengthening the functions of primary care physicians and enhancing home medical care as receivers of patients discharged from hospitals (Kaneko and Matsushita, 2017). Therefore, existing clinics

inevitably tend to be located around hospitals, to promote smooth cooperation with hospitals.

However, medical malls are also likely to open strategically in locations where hospitals have not entered the market to avoid competition from hospitals. These locations are those near stations and shopping malls that have high levels of human traffic and are convenient for living and transportation. Another reason for clinics becoming clusters is that clustering is a strategic way to reverse the problem of transaction costs that arise in clinic management (Macher and Richman, 2008). In Japan, under the government's leadership, the high hurdles of setting up hospitals and hospital beds to control the country's overall health care costs, fluidity of hiring medical staff, high cost of maintaining physician personnel and medical equipment, and other factors, make the transaction costs of expanding internal organizations very high. Meanwhile, these regulations can work to the advantage in clinics. As a rule, management resources traded in health care are limited to goods and services that have undergone rigorous review and approval by the state. Thus, the cost of procuring them through the market is low. Clinics can be expected to strengthen their management while controlling transaction costs by purchasing the necessary resources from the outside (market). This situation can explain the incentives for clinics to consolidate geographically and is reflected in the results of these analyses.

Third, our analysis of the growing number of clinical departments in the medical malls revealed that there is an increase in the number of specialty departments that are different from existing clinics. To verify the effect of increasing the number of clinical departments in medical

malls, we compared and analyzed the distribution of clinical departments in medical malls and existing clinics. In the past 11 years, the number of clinical departments in medical malls increased by an average of 3.41% (Table 9). For example, among 33 departments, the number increased in 28 departments, including gastroenterology, allergology, pediatric dentistry, rehabilitation, and orthodontics. In 2008, medical malls consisted mainly of the major clinical departments existing in existing clinics, such as internal medicine, general dentistry, and pediatrics. In 2019, however, the clinical expertise was increasingly distributed among multiple clinical departments in addition to these major ones (Table 10).

Based on the above results, specialists in these departments may establish themselves in medical malls to differentiate themselves from other clinic doctors. Presently, the number of clinics, including dental clinics, has reached 170,000, indicating the market is saturated. The government's fiscal restraint on health care funding and negative revisions to reimbursement rates have made the operation of clinics even more difficult.

If general practitioners have a competitive advantage in these market conditions, they should have an incentive to choose a location with high population density and efficient customer acquisition potential, or to choose a specialty with fewer competitors. However, the hurdle for a specialist who has worked as a hospital doctor to open a new practice in an urban area is extremely high. The initial cost of accessible locations is too great owing to high land prices and rents. However, practitioners can open a medical mall with low initial costs and provide high-quality, highly specialized medical care by building complementary

relationships with other specialists and pharmacies. This is expected to stabilize the ability to attract customers and revenue (Epstein, 2016). By maximizing the strengths of these medical malls, these medical practitioners may be developing a differentiation strategy against existing clinics.

(5) Conclusion

We conducted a thorough survey of medical malls in Japan to explore the factors that contribute to the clustering of clinics. The results of the analysis indicated the following. In the Tokyo metropolitan area, Osaka, and Hokkaido, where competition among clinics is fierce, medical malls have been developed under a cluster strategy in order for specialists in clinics to have a competitive advantage; 80% of all medical malls are concentrated in these areas. Considering that the medical mall is located in a place with convenient transportation and overall access in the city, it can be expected to improve the access to medical care on the patient side, which is particularly advantageous for specialists as well. Therefore, if a medical specialist opens a clinic in a medical mall, then they may be able to differentiate their practice from existing clinics.

Based on the above, the medical mall can be construed to operate strategically in terms of location and clinical departments, confirming the presence of functioning competition. However, the findings obtained from this analysis only revealed parts of the strategy and management behavior of medical malls from the difference in distribution of location and clinical departments. In addition, we have not clarified that competition between clinics works effectively, and it does not guarantee low cost, quality medical care, or soundness of clinic

management. However, we would emphasize that the value of the present study as a pilot study demonstrating the need for empirical studies in each local area in the future is not compromised by the fact that it illustrates well the national cases where clusters of clinics are occurring. It is necessary to analyze in detail the management behavior of medical malls in a limited area in the future.

For a long time, research has noted that the formation of industrial clusters contributes significantly to the enhancement of competitiveness and growth of firms and economies, and a similar phenomenon has been discovered in the clinic health care market. In particular, the formation of clusters of clinics could solve efficiency and productivity problems by strengthening management. Further surveys must be conducted to clarify these problems, and future research should undertake empirical analyses.

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Effect of Empowering Leadership on Creativity and Ability of Employees: Comparison of Regular and Non-Regular Employees

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Abstract

The aim of this paper is to clarify the effect of empowering leadership on the exertion of employees' creativity and ability from comparison of regular and non-regular employees. Based on the results of the literature review, we set the hypothesis that empowering leadership influences creativity and ability through mediation of psychological empowerment. In order to verify the hypothesis, multiple-group structural equation modeling (Structural Equation Modeling: SEM) was performed using questionnaire survey data obtained from 423 employees working in the wholesale and retail industries. From the analysis results, the mediating effect of psychological empowerment was confirmed only for the ability of regular employees. The mediation effect of psychological empowerment on the exertion of employees' creativity and ability of non-regular employees was not confirmed. From the results of this study, it has been clarified that the influence of empowering leadership on employee's creativity and ability depends on the employment type of the employee.

Keywords

Regular employees, Non-regular employees, Empowering leadership, Psychological empowerment, Multiple-group SEM

(1) Introduction

The aim of this paper is to clarify the

following research questions: "Is empowering leadership by managers effective for exertion

of employees' creativity and ability when comparing regular and non-regular employees?"¹

In recent years, the business environment has changed significantly. Therefore, not only the top management of companies but also general employees are required to exert their creativity and ability. Toma and Okamoto (2005, 2006) and Toma (2006, 2013) reveals that managerial leadership behavior plays an important role in these.

Specifically, many studies have shown that empowering leadership is effective. And, it has been clarified that the execution of empowering leadership indirectly influences creativity and abilities employees.

The effects of this execution of empowering leadership will be examined in more detail. Therefore, it is necessary to verify the effect based on the difference in industries, occupations and employment type. However, there are not so many such studies. In other words, there are few studies that demonstrate how the effects of the execution of empowering leadership differ due to these differences. Therefore, this study was reexamined by focusing on the effects of the execution of empowering leadership and the employment type (especially comparing regular and non-regular employees).

(2) Outline of Empowering Leadership Research

1. Definition of empowering leadership

Originally, leadership research focused on the principles of leadership represented by trait theories, behavioral theories, and contingency theories. In recent years, the focus has shifted to building leadership styles for application in the field. Among them, empowering leadership is the representative leadership style².

Empowering leadership is a leadership style that promotes the autonomous behavior of employees. It is defined as "this leadership style empowers employees psychologically and encourages their autonomous behavior. " There are various views on the concept of empowering leadership. A common feature of these studies is the view that "leadership aims to enhance the psychological empowerment of employees³."

As an example, Aoki (2013) and Sharma and Kirkman (2015) pointed out that empowering leadership is the leadership that makes employees perceive themselves to be psychologically empowered. Empowering leadership means more than just involving employees in delegation and decision making. Rather, this leadership involves a wide range of motivations, such as the employees themselves setting goals and changing their willingness and behavior.

It was Thomas (2000) who pointed out

¹ Currently, there are more than just two types of employment in Japan: full-time and part-time. For example, regular employees, rehired regular employees, temporary employees and part-time employees, etc. Because of this situation, the terms regular employees and non-regular employees are used in this paper.

² In addition to empowering leadership, there are several leadership styles. For example, typical styles are transformational leadership and servant leadership.

³ The psychologically empowered state is that the employee recognizes himself/ herself as a powerful person. In order to recognize in this way, it is said that the following specific psychological states need to be enhanced. That is, (1) sense of meaning, (2) sense of self-determination, (3) competence, and (4) sense of influence. These four psychological states are collectively called "psychological empowerment".

that empowering leadership is a leadership that encourages autonomous behavior of employees. In recent years, companies need to acquire and maintain a sustainable competitive advantage. Therefore, it is more and more necessary for employees to think on their own, make their own decisions, and act. And these needs for employees have recently been demanded due to the lack of independence of young employees. Based on the above points, this research defines empowering leadership as follows. That is, it is "empowering leadership is a leadership that psychologically empowers employees and promotes their autonomous behavior."

2. Effects of the execution of empowering leadership

In the late 2000s, not only theoretical research but also empirical research has been focused and conducted in relation to the effects of empowering leadership exercise. As mentioned at the beginning, empowering leadership exertion is said to indirectly influence the exertion of creativity and ability by psychologically empowering employees.

Some research that highlights the exertion of creativity and ability as an effect of empowering leadership exercise are surveyed. As a result, two studies are found out. That is, 1. Research that targets individuals, 2. Research that targets teams. It has been pointed out that the effect of this exercise is not limited to innovation-related variables. And, because of exercising these, studies have also pointed out variables related to employee attitudes.

Here, specifically, some research will be presented. Zhang and Bartol (2010) studied the creativity of each employee as a result.

Hon and Chan (2013) studied the creativity of the team as a result. And finally, Dewettinck and Amejide (2007) studied variables related to employee attitudes. This study specifically addressed job satisfaction and emotional commitment as outcome variables.

Interestingly, all of these studies had similar validation results. It was that the execution of empowering leadership indirectly influenced the outcome through the psychological empowerment of employees. This means that psychological empowerment functions as a mediation.

In order to produce results such as creativity, it is necessary to enhance the psychological empowerment of employees. And empowering leadership plays a role in making the employees perceive that they are psychologically empowered. In other words, empowering leadership does not directly affect achievements such as the exertion of employees' creativity and ability, job satisfaction and emotional commitment. However, this means that by psychologically empowering the employee, it indirectly influences.

3. Analysis framework of this research

Based on the results of the previous studies that have already been described, this study constructed an analysis framework as shown in Figure 1. Here are the following questions. How does the execution of empowering leadership make employees exert the creativity through the psychological empowerment? And is it effective in increasing their performance? An empirical analysis of these two questions will be made clear for regular and non-regular employees within the same company.

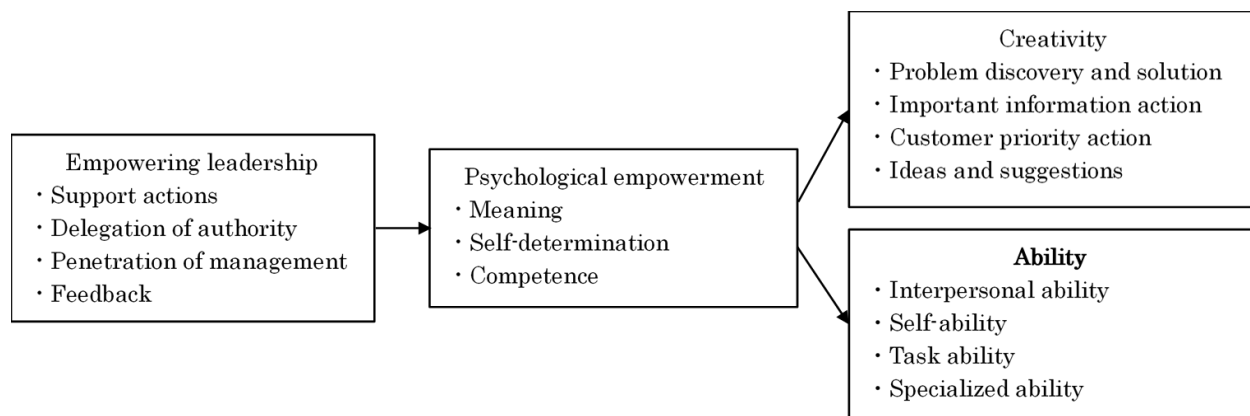


Figure 1 Analysis framework of this research

The model in Figure 1 shows that: The manager executes of empowering leadership for the employee. Then, the psychological empowerment of the employee increases. As a result, the exertion of employees' creativity and ability are promoted. An overview of each variable in Figure 1 is shown below.

3.1 Psychological empowerment

Psychological empowerment is a concept that represents a specific psychological state of an individual. This concept consists of four dimensions: (a) meaning, (b) self-determination, (c) competence, (d) impact. The contents of these four dimensions are explained below.

(a) Meaning

A sense of meaning is the value of the goal or purpose of a task judged from the perspective of individual ideals or standards. The degree of meaning decreases when the ideals and standards of an individual deviate from the role requirements of work. On the contrary, the degree of sense of meaning increases when the ideals and criteria of the individual and the role requirements of the work match.

(b) Self-determination

A sense of self-determination means responsibility for individual behavior. It is the

sense that the person has the option to initiate and control his/her actions.

(c) Competence

Competence is the ability of an organism to interact effectively with the environment by an individual. In other words, competence is the degree of confidence that one's actions can influence the environment. It is a concept similar to self-efficacy. Some researchers consider these two to be the same concept. The difference between this competence and self-efficacy is that the belief in one's own behavior is defined in its interaction with the environment.

(d) Impact

Impact is the degree of confidence that one's actions make a difference from others from the viewpoint of achieving the purpose of the task, or that it produces the intended effect in the task situation.

In this research, three of these four dimensions as the constituent dimensions of psychological empowerment was set. That is a sense of meaning, a sense of self-determination, and competence.

In this study, the concepts of meaning, self-determination, and competence among these four dimensions were focused on. The reason is why these three concepts are the

preconditions for the exertion of employees' creativity and ability. In addition, Bandura (1995) points out that self-efficacy (competence) is a prerequisite for a person to be in a state of influence. In other words, the impact is considered to be a psychological state as a result of human behavior. Therefore, this is excluded in this paper.

3.2 Empowering leadership

The dimensions that make up empowering leadership were captured from four dimensions with reference to the research by Thomas (2000). These are (a) support actions, (b) delegation of authority, (c) penetration of management policies, and (d) feedback.

(a) Support actions is to provide specialized knowledge, skills, and know-how in order to enable employees to perform their jobs well. This, of course, includes the manager's own illustration of exemplary behavior to the employee. These actions would be expected to enhance competence.

(b) Delegation of authority is a leadership action that was generally taken up in past empowerment research. As its name implies, delegation of authority would be expected to enhance self-determination.

(c) Permeation of the management policy is to make employees understand the philosophy and vision of the company. And this includes articulating the specific goals of the employee's job. Clarifying the philosophy, vision, and concrete goals will clarify the areas of action of the employees themselves. At the same time, it is expected that the employees themselves will be able to work on their jobs without feeling anxiety. The penetration of management policy, thinking from its content, would be expected to

enhance its sense of meaning.

(d) The feedback is that the manager explains the result of the exercise by the employee. Employees cannot know their abilities (competence) unless feedback information is obtained. And without it, he / she cannot know the business meaning for his / her own work. Thus, it is expected that correct feedback will affect competence and a sense of meaning, enhance psychological empowerment.

3.3 the creativity exertion

The creativity was captured from four dimensions with reference to Takaishi and Furukawa (2008). That is, (1) problem discovery and solution, (2) important information action, (3) customer priority action, and (4) ideas and suggestions. Among these, three are (1) problem discovery and solution, (2) important information action, and (3) customer priority action, which are actions in the process of bringing improvement / reform to an individual's work or plan. (4) Ideas and suggestions are actions in the process of promoting innovative proposals from the individual level to the organizational level.

3.4 the ability exertion

The ability exertion is captured from four dimensions with reference to Okubo (2011). These are (1) interpersonal ability, (2) self-ability, (3) task ability, and (4) specialized ability. Of these, competency expressed as behavioral characteristics is the three: (1) interpersonal ability, (2) self-ability, and (3) task ability. This is the ability to manifest by acting. (4) specialized ability is the ability to have the knowledge, skills and know-how necessary for work.

4. Hypothesis

The hypothesis of this research derived from the above analysis framework is as follows.

4.1 Hypothesis 1

For regular employees, the execution of empowering leadership by managers influence the exertion of their creativity and ability by enhancing their psychological empowerment.

4.2 Hypothesis 2

For non-regular employees, the execution of empowering leadership by managers influence the exertion of their creativity and ability by enhancing their psychological empowerment.

Hypothesis 1 targets regular employees. As in previous studies, the execution of empowering leadership is expected to influence the exertion of their creativity and ability by enhancing psychological empowerment.

Hypothesis 2 targets non-regular employees. Few studies have been conducted on non-regular employees. Aoki and Kitano (2019) have revealed that increased psychological empowerment of non-regular employees promotes the exertion of their creativity and ability. Therefore, in this study, even for non-regular employees, it is expected that the execution of empowering leadership influences the exertion of their creativity and ability by enhancing psychological empowerment.

(3) Method

1. Analysis method

In this study, multiple-group SEM was

adopted as the analysis method. multiple-group SEM is an analysis method that compares different populations such as regular employees and non-regular employees. Therefore, in this research, empirical research is conducted using this analysis method.

By the way, the population-based analysis is an analysis method similar to the multiple-group SEM. Population-based analysis has the following two problems (Toyota, 2007). First, population-based analysis can assess differences between populations at different parts of the model. However, the differences in the model cannot be easily evaluated. Second, when analyzed by population, the number of samples per population decreases. Then, the stability of the estimated value in each population may be impaired.

Multiple-group SEM is the simultaneous analysis of different populations. Therefore, it is possible to judge the difference between populations in the entire model based on the model goodness-of-fit index⁴. Furthermore, after the data are extracted from different populations, an analysis that considers the effects of the population is performed. Therefore, the problem that the number of samples decreases can be solved. Therefore, for the above reasons, multiple-group SEM is adopted in this study.

2. Survey method

A questionnaire survey was conducted to verify these two hypotheses. The outline is as follows.

⁴ GFI, AGFI, CFI and RMSEA are the most commonly

used model suitability indicators.

2.1 Survey implementation period

The survey was conducted from 24 November 2017 to 11 January 2018.

2.2 Implementation location

The survey was conducted on employees in "Company A," who runs the ice cream wholesale business and the supermarket business.

2.3 Questionnaire distribution and collection method

The survey was distributed as a questionnaire through a person in contact with "Company A". And it was collected at a specific place.

2.4 Questionnaire collection rate

The questionnaire recovery rate was 84%. For details, 525 were distributed and 441 were collected. The final survey subjects were 423 people who did not have missing values for the question items used in the analysis of this study. The details were 216 regular employees and 207 non-regular employees.

2.5 Attributes of regular employees

Regarding sex, there were 216 males and 0 females. Regarding age, 57 were under 25 years old, 62 were 26-35 years old, 73 were 36-45 years old, 19 were 46-55 years old, and 5 were 56 years old or older. The number of years of service was 149 for 5 years or less, 52 for 6 to 15 years, 11 for 16 to 25 years, and 4 for 26 years or more.

2.6 Attributes of non-regular employees

Regarding sex, there were 42 males and 165 females. Regarding age, 60 were under 25 years old, 28 were 26-35 years old, 39 were 36-45 years old, 44 were 46-55 years old, and 36 were 56 years old or older. The number of years of service was 131 for 5 years or less, 54 for 6 to 15 years, 21 for 16 to 25 years, and 1 for 26 years or more.

2.7 Department

Regarding the departments to which they belonged, there were 216 root sales employees (regular) and 207 sales and customers (non-regular).

3. Question items

For the purpose of verifying the hypothesis presented in this research, the question items of the following four variables were created. These were empowering leadership (3.1), psychological empowerment (3.2), the creativity exertion (3.3), and the ability exertion (3.4). (Refer to List of question items)

All items were rated on a 6-point scale, from "exactly" to "totally different".

3.1 Measurement scale of empowering leadership

As a measure of empowering leadership, A total of 22 items were cited from the studies of Thomas (2000), Nakahara (2010) and Matsuo (2013). As for details, there were 7 items for support actions, 5 items for delegation of authority, 6 items for penetration of management policy, and 4 items for feedback.

3.2 Measurement scale of psychological empowerment

A total of 13 items of psychological empowerment were quoted from the measurement scale of Thomas (2000). As for details, 5 items were meaning, 3 items were self-determination, and 5 items were competence.

3.3 Measurement scale of creativity

A total of 16 items of creativity were quoted from Takaishi's (2013) measurement scale. The details were 4 items for problem discovery and solution, 4 items for important

information action, 4 items for customer priority action, and 4 items for ideas and suggestions.

3.4 Measurement scale of ability

A total of 12 items of ability were quoted from the measurement scales of Okubo (2010) and Motomura and Kawaguchi (2013). The details were 4 items for interpersonal ability, 2 items for self-ability, 4 items for task ability, and 2 items for specialized ability.

(4) Analysis result

1. Factor analysis results

It is necessary to verify that the data collected by the questionnaire survey has a factor structure according to the model assumed in advance. Therefore, exploratory factor analysis was conducted for all employees. This exploratory factor analysis was carried out until the structure became simple. In addition, with the eigenvalue of 1 or more as the factor extraction criterion, question items showing a factor load of less than 0.4 or multiple factors of 0.3 or more were deleted.

Then, a confirmatory factor analysis was performed based on the results of the exploratory factor analysis. This verified the goodness of fit of the model and the data. The model fitness index used here is as follows: GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation).

In addition, it is considered that the model goodness of fit indexes does not show a sufficient value. Therefore, for the purpose of standardizing the coefficient from the latent variable of each factor to the observed variable, the items showing relatively low

values were deleted. Then, confirmatory factor analysis was performed again. For the question items that make up each variable, the α coefficient was calculated based on 0.7 or more. Its reliability was confirmed. The results of these factor analyses are as follows.

Empowering leadership was a three-factor structure with a total of 13 items. Psychological empowerment was a three-factor structure with a total of seven items. Exertion of creativity was a four-factor structure with a total of 16 items. It was found that the exertion of the ability was a two-factor structure with a total of 12 items.

Regarding empowering leadership, this study did not identify support actions and delegation. Therefore, it is newly named as a delegation support action. Also, regarding the exertion of ability, no distinction was made between (2) self-ability, (3) task ability, and (4) specialized ability. Therefore, it was newly named personal ability. (Shown in Table 1~Table5).

The value of the α coefficient for each factor extracted by factor analysis was 0.7 or higher in all cases. Empowering leadership (delegation authority support action = .906, management policy penetration = .931, feedback = .941). Psychological empowerment (meaning = .879, self-determination = .821, competence = .907). The creativity exertion (problem discovery and solution = .900, important information action = .917, customer priority action = .927, ideas and suggestions = .937). The ability exertion Demonstrate ability (interpersonal ability = .877, personal ability = .887).

Table 1 Results of the exploratory factor analysis (EL)

	Delegation support action	Penetration of management policy	Feedback
Q1-1	.776	.214	.189
Q1-3	.548	.263	.200
Q1-4	.566	.219	.069
Q1-6	.594	-.250	.188
Q1-8	.702	.039	.096
Q1-9	.873	.021	.007
Q1-11	.709	-.031	.018
Q1-14	.135	.746	-.014
Q1-15	-.105	1.005	-.013
Q1-16	-.067	.955	-.003
Q1-19	.223	-.150	.800
Q1-20	-.046	-.018	.915
Q1-21	.077	.094	.869

Table 2 Results of the exploratory factor analysis (PE)

	Meaning	Self-determination	Competence
Q2-1	.709	-.056	.100
Q2-3	.877	.020	-.005
Q2-4	.884	.045	-.067
Q2-7	.083	.656	.019
Q2-8	-.058	1.015	.005
Q2-10	.050	.023	.762
Q2-11	.027	.001	.966

Table 3 Results of the exploratory factor analysis (Creativity)

	Problem discovery and solution	Important information action	Customer priority action	Ideas and suggestions
Q3-1	.868	.075	-.099	-.022
Q3-2	.801	.047	.079	-.079
Q3-3	.687	-.004	.023	.079
Q3-4	.606	-.096	.054	.178
Q3-5	.193	.660	.073	.008
Q3-6	.015	.869	-.062	.060

⁵ Configuration invariance is the following hypothesis. Even if the path diagrams are the same between

Q3-7	-.087	.920	-.072	-.100
Q3-8	.023	.698	.197	.128
Q3-9	.020	.139	.613	.008
Q3-10	-.060	.019	.734	.060
Q3-11	.082	-.103	.898	-.100
Q3-12	-.032	.061	.619	.128
Q3-13	-.093	.145	.077	.743
Q3-14	.048	-.040	-.035	.954
Q3-15	.173	-.124	.032	.856
Q3-16	-.039	.249	-.045	.645

Table 4 Results of the exploratory factor analysis (Ability)

	Interpersonal ability	Personal ability
Q6-1	.787	-.082
Q6-2	.792	-.049
Q6-3	.738	.018
Q6-4	.824	-.077
Q6-5	.110	.501
Q6-6	.205	.580
Q6-7	.224	.523
Q6-8	.184	.564
Q6-9	.245	.529
Q6-10	.280	.501
Q6-11	-.129	.969
Q6-12	-.048	.919

Table 5 Results of the confirmatory factor analysis

	GFI	AGFI	CFI	RMSEA
EL	.887	.843	.906	.078
PE	.921	.897	.943	.065
Creativity	.916	.874	.957	.081
Ability	.898	.854	.914	.071

Next, two populations, regular employees and non-regular employees, need to make sure that a factor model with the same structure can be assumed. For this reason, configural invariance was examined in a multiple-group SEM ⁵.

groups, the estimated values may be different.

As a result, the goodness-of-fit index was shown as a good model in any scale. The results are shown in Table 6. Thus, the configural invariance was confirmed.

Table 6 Goodness-of-fit index for placement-invariant model

	GFI	AGFI	CFI	RMSEA
EL	.855	.791	.938	.065
PE	.971	.925	.983	.033
Creativity	.905	.852	.931	.055
Ability	.894	.831	.917	.065

2. Results of model analysis by employment type

The aim of this research was to make a difference in each model due to the difference in employment type. To examine these, it was necessary to perform a multiple-group SEM.

In the multiple-group SEM, the following three models were set.

Model 1 : all path coefficients are unconstrained

Model 2 : assuming equal path coefficients from latent variables to observed variables

Model 3 : in addition to Model 2, it is assumed that the path coefficients between latent variables are also equal

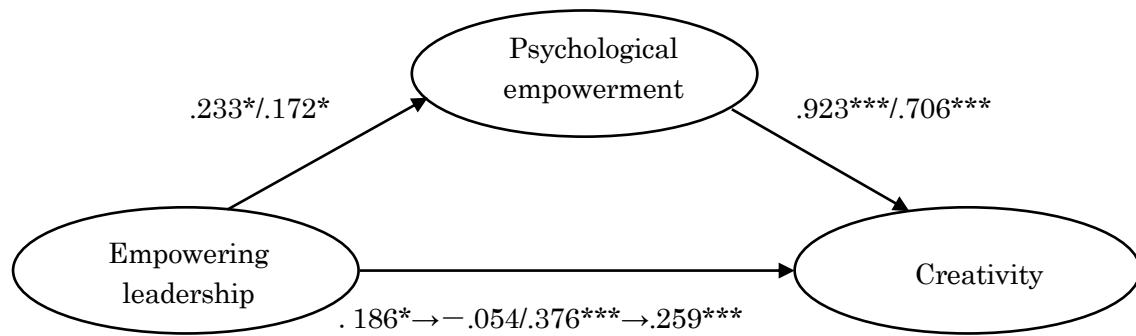
It was examined whether a model of the same structure was assumed. Note that GFI, AGFI, CFI, RMSEA, and AIC (Akaike's Information Criterion) were used as the fitness index of each model. As a result, the goodness-of-fit index of Model 2 was the best overall. (Shown in Table 7). For this reason, Model 2 was adopted in this study. Then, the subsequent analysis was conducted.

Table 7 Fitness index of each model

	GFI	AGFI	CFI	RMSEA	AIC
Model 1	.757	.716	.881	.056	2381.691
Model 2	.755	.720	.880	.052	2371.240
Model3	.753	.720	.878	.055	2387.213

Please refer to Figure 2 and Figure 3. These figures show the results of the multiple-group SEM of Model 2 by employment type. For psychological empowerment, which is a mediating variable, the 95% confidence interval was calculated by the bootstrap method (1,000 re-samplings), and it was examined whether the indirect effect was significant.

We also confirmed the extent to which the path coefficient from the empowering leadership of the independent variable to the creativity and ability of the dependent variable were changed by interposing the mediating variable. Based on this, it was examined whether the mediating effect of psychological empowerment is a complete mediation or a partial mediation. The indirect effect is significant if 0 is not included in the 95% confidence interval. And, if 0 is included, it becomes insignificant. Also, when the value of the path coefficient becomes insignificant, it becomes a complete mediation. If it remains significant, it is a partial agent.

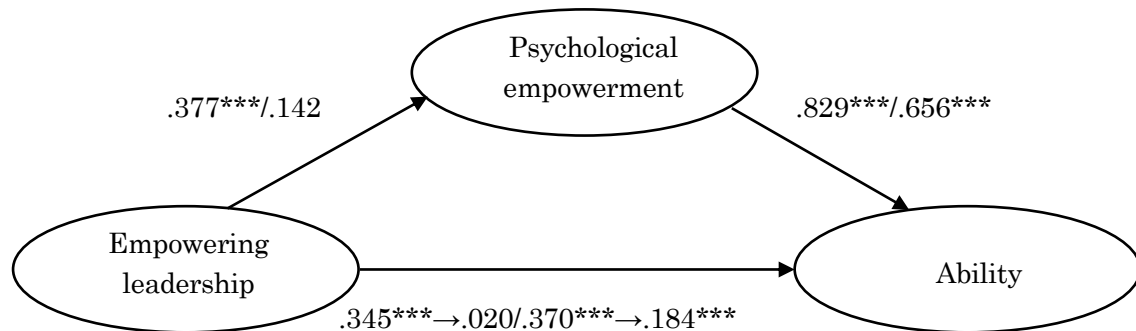


(* Pass coefficient values are regular on the left and non-regular on the right)

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

95%CI [-.134, .674] /95%CI [-.027, .256]

Figure 2 Mediation model of creativity with objective



(* Pass coefficient values are regular on the left and non-regular on the right)

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

95%CI [.040, .693] /95%CI [-.053, .260]

Figure 3 Mediation model of ability with objective

The results of the analysis partially supported Hypothesis 1. And, the result supporting Hypothesis 2 was not obtained.

For regular employees, manager's empowering leadership was influenced by psychological empowerment to exert their abilities. However, creativity was not influenced by psychological empowerment.

On the other hand, for non-regular employees, the manager's empowering leadership had no effect on the exertion of

employees' creativity and ability, through psychological empowerment.

In regular employees, the relationship between empowering leadership and the exertion of employees' ability did not include 0 in the 95% confidence interval (.040, .693). The value of the path coefficient from empowering leadership to ability development changed from .345 ($p < .001$) to .020 (non-significant). Therefore, the mediating effect of psychological

empowerment was complete mediation.

On the other hand, when the objective variable was creativity, 0 was included in the 95% confidence interval (-.134, .674). Therefore, the mediating effect of psychological empowerment was not confirmed.

The relationship between empowering leadership and the exertion of employees' creativity and ability in non-regular employees is as follows. When the objective variable was creativity, 0 was included in the 95% confidence interval (-.027, .256). When the objective variable was ability, 0 was included in the 95% confidence interval (-.053, .260). In all of the above cases, the mediating effect of psychological empowerment was not confirmed.

(5) Conclusion of this study

1. Discussion of analysis results

Here, the analysis results of this research are summarized.

In short, the effects of empowering leadership were different for regular and non-regular employees.

In a conventional study of regular employees, it was said that empowering leadership influences the exertion of employees' creativity and ability through psychological empowerment. In the present study, similar results were obtained with regard to the results of verification of employees' ability exertion. However, the mediating effect of psychological empowerment was not confirmed in the result of verification of employees' creativity exertion. This was thought to be because the data was collected and analyzed for employees whose tasks were relatively

routine. It would, of course, be expected to have different results when targeting employees whose tasks are complex.

A study of non-regular employees found no mediating effect of psychological empowerment on either creativity or performance. However, looking at the magnitude of the path coefficient for creativity and performance of abilities from the model for non-regular employees, psychological empowerment had a great influence. It was found that psychological empowerment needs to be enhanced to promote the creativity and ability of non-regular employees. That is, the reason why the mediating effect of psychological empowerment was not confirmed was examined. It shows that empowering leadership is not effective for non-regular employees.

The reason why empowering leadership did not affect the psychological empowerment of non-regular employees will be considered. The first reason is that when compared with regular employees, the purpose of work and the opportunity for vocational training were different. Non-regular employees and regular employees generally have different opportunities for in-house training. The lesser opportunities for in-house training, such as non-regular employees, make them less confident that they will be able to perform their actions well, even if they are assigned the job. Therefore, it becomes difficult to improve the competence.

The most common reason for non-regular employees to work under the status of non-regular employment is to earn supplementary income. In a comprehensive fact-finding survey (2014) on diversification of

employment styles, the Ministry of Health, Labor and Welfare shows the reasons for choosing the employment style of non-regular employment. Most often I was able to work at my convenience (37.9%). And the next most thing I wanted to do was get home assistance and tuition (30.6%). When working for this purpose, even if delegated to the power of the organization, they would only see it as an increase in the amount of work if they could not increase the income. In other words, the non-regular employee thinks that the purpose of the work and the role demand of the company are divergent. That means that the sense of meaning does not increase. As described above, in order to enhance the psychological empowerment of non-regular employees, not only empowering leadership but also a management system that supports them within the company (changes in job design and compensation system, etc.) is necessary.

2. Subsequent issues

Finally, the issues in this paper are summarized below. First, we could not clarify the process of non-regular employees to the exertion of their creativity and ability. The starting point of this research was the research question, "Is the empowering leadership by managers effective for the exertion of employees' creativity and ability?" It was to clarify this from the comparison between regular employees and non-regular employees. It was found that empowering leadership, which is valid for regular employees, is not valid for non-regular employees. However, it was not clear what was the factor that encouraged the exertion of employees' creativity and ability of non-

regular employees. Regarding these points, it is necessary to empirically clarify the relationship between the management system (job design and reward system) and psychological empowerment as a factor different from empowering leadership. The above is the subsequent subject.

Secondly, there may be a bias in the collected data. For example, even employees with the same employment pattern may have different results depending on gender. However, the data collected in this study did not have any female regular employees. The effect of empowering leadership could not be verified by gender comparison. In the subsequent studies, it is necessary to verify the effect of empowering leadership from the combination of employment type and gender. In addition, it was the wholesale / retail industry that was the subject of this study. It was necessary to conduct a similar survey for other wholesale / retail and restaurant businesses where non-regular employees often carry out core business. These are indispensable verifications because they serve as the basis for examining the possibility of generalizing the theory. It will be the subject after that.

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Appendix

Questions about empowering leadership (22 items)

Support actions

Q1-1 Your boss often provides specialized knowledge, skills, and know-how that will improve your work.

Q1-2 My boss often dispatches a help boat when you are in trouble.

Q1-3 Your boss patiently takes time to discuss your business problems.

Q1-4 My boss is trying to lead his subordinates by setting an example.

Q1-5 Your boss will give you an objective opinion about your work.

Q1-6 Your boss is encouraging you to come up with a way to work when your job goes wrong.

Q1-7 My boss treats his subordinates equally.

Delegation of authority

Q1-8 My boss listens to the ideas and suggestions given by his subordinates.

Q1-9 My boss often gives my subordinates a chance to express their opinions.

Q1-10 The boss basically entrusts you with the work.

Q1-11 Your boss will let you do the work you can do if you work hard.

Q1-12 My boss entrusts me with a task that is slightly higher than your ability.

Penetration of management policy

Q1-13 Your boss will explain how meaningful your work is for you.

Q1-14 Your boss will explain how meaningful your job is for your company and workplace.

Q1-15 Your boss will explain to you the policies, policies and goals of the company.

Q1-16 Your boss will explain to you the meaning of the company's policies, policies and goals.

Q1-17 Your boss will explain your workplace vision and role in relation to company-wide policies, policies and goals.

Q1-18 My boss is focusing on a few important items about your workplace issues.

Feedback

Q1-19 My boss will always give me hard work regardless of the success or failure of your work.

Q1-20 Your boss first tells you what is good about your work and then points out the problem.

Q1-21 Your boss will tell you the parts you feel have grown up in your regular work.

Q1-22 Your boss will honor your growth honestly.

Questions about psychological empowerment (13 items)

Meaning

Q2-1 You value your current work.

Q2-2 You think that your work is useful for important things.

Q2-3 The work you are doing is important to you.

Q2-4 It is meaningful to you that you try to achieve it at work.

Q2-5 You are doing something worthwhile.

Self-determination

Q2-6 How you deal with things is up to you.

Q2-7 You decide for yourself what to do at work.

Q2-8 You decide a lot of things yourself.

Competence

Q2-9 I am good at your current job.

Q2-10 You are now proficient in what you are doing.

Q2-11 You can work efficiently.

Q2-12 You can do your job well.

Q2-13 You can manage your job well.

Question items about creativity (16 items)

Problem discovery and resolution

Q3-1 You solve work problems efficiently.

Q3-2 You work while improving daily.

Q3-3 You clarify work issues / problems.

Q3-4 You work more efficiently.

Important information action

Q3-5 You are collecting information related to the company and workplace.

Q3-6 You are deepening your knowledge of the industry and competitors.

Q3-7 You are studying a field that you think is necessary for your company or work.

Q3-8 You are collecting the information necessary to carry out your work.

Customer priority action

Q3-9 You respond based on the requests and interests of customers and related departments.

Q3-10 You often hear the needs and complaints from customers and related departments.

Q3-11 You give priority to customers and

related departments.

Q3-12 You give an opinion from the standpoint of the customer and related departments.

Ideas and suggestions

Q3-13 You are giving out an idea that you have never seen.

Q3-14 You come up with a better way.

Q3-15 You come up with a more efficient way.

Q3-16 You are explicitly proposing ideas for new projects and work style reforms.

Question items about demonstrating ability (12 items)

Interpersonal ability

Q4-1 You can respect the opinion of the other person more than before.

Q4-2 You can be more interested in the other person's facial expression, appearance, physical condition, etc.

Q4-3 You can talk to any person from the same point of view than before.

Q4-4 You can honestly praise the good points of the other party.

Self-ability

Q4-5 You can stabilize your mind and work more everyday than before.

Q4-6 You are more confident that your work will be accomplished better than before.

Task ability

Q4-7 You can investigate the causal relationship of problems and clarify what is the real problem than before.

Q4-8 You are not distracted by past cases and emotions and do not offer easy solutions than before.

Q4-9 You can make solutions and deal with problems faster than before.

Q4-10 You can act with the belief that you can always achieve it more than before.

Specialized ability

Q4-11 You are able to work faster than before.

Q4-12 You are able to work more accurately than before.

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Government Evaluations in Japan's Municipalities Based on Nationwide Survey Data

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Abstract

Government evaluations in Japan are linked to business culture. This study investigated the government evaluations in cities and towns/villages using primary survey data. The surveys were conducted by the author and Hiroshima University in 2006, 2014, and 2015. The 2006 and 2014 surveys (Nationwide Survey of Japanese Cities Regarding Government Evaluations) were on city municipalities in Japan, and the 2015 survey investigated town and village municipalities (Nationwide Survey of Japanese Towns and Villages). This study, based on the survey data, intends to identify the changes in government evaluations in Japan's local municipalities over time and attempts to determine the differences among municipalities of different sizes.

A dominant method of government evaluations in Japan's municipalities is *Jimujigyo Hyoka*, a cross-sectional evaluation of programs via performance measures, which is implemented by 80% of municipalities with government evaluations. The survey data suggested the differences between the cities and smaller municipalities in terms of implementation and challenges. Cities were more likely than smaller municipalities to implement evaluations (84.6% vs. 37.4%). Some of the differences were with regard to implementation rates, the reasons for implementation, and the types of problems they were encountering. Thus, smaller municipalities needed different approaches of evaluation compared with cities.

An important finding of this study is that the smaller municipalities were relatively less interested in conducting government evaluations owing to their limited resources. Fiscal constraints tend to limit the number of public officials in small municipalities, and those officials tend to lack the expertise needed to conduct evaluations. Thus, officials in relatively small municipalities need focused training to obtain the skills necessary to implement evaluations.

Keywords: Government Evaluations, Local Municipalities, Urban Management, Public Officials, *Jimujigyo Hyoka*,

(1) Introduction

In Japan, *Jimujigyo Hyoka*, a cross-sectional evaluation of programs, is based on the method of performance measurement. This evaluation method focuses on the performance of each *Jimujigyo* (program and project) in all departments and creates evaluation results sheets in a unified format based on ex-post evaluations. Its use has spread throughout Japan's municipal governments under the influence of New Public Management (NPM), and, in particular, the reinventing government movement (Osborne & Gaebler, 1992) in the United States. Azuma (2002) proposed that fiscal deterioration, such as increases in long-term debt, was the background of NPM, arguing that emphasizing efficiency or effectiveness promoted the implementation of policy evaluation systems in Western countries.

There may also be a relationship between program evaluation and auditing. For example, Yamamoto and Watanabe (1989) explained performance auditing in Japan by linking it to deteriorating financial conditions. Hatry (2013) described the history of and relationship between program evaluation and performance measurement in the United States. Kudo (2015) employed literature reviews to analyze the association between conventional public administration and NPM theories, including post-NPM, New Public Governance (NPG), and administrative reforms. Yonezawa (2007) discussed evaluations in the context of reforms in higher education.

Theories and evaluation techniques became a focus for practitioners and scholars of Japanese public administration in the early 1990s. Morisugi (2000) examined manuals on evaluating transit projects such as roads, railways, airports, and seaports, and found that inconsistencies among the manuals across policy areas led to difficulties in preparing universal evaluation frameworks. Earlier, Tanaka (1989) had discussed how the Ministry of International Trade and Industry (MITI)

had evaluated national research and development projects in the 1960s through to the 1980s. It was not until the Mie prefectural government introduced *Jimujigyo Hyoka* and other evaluation measures that Japanese policy circles considered evaluation an important activity.

After the introduction of the system in Mie Prefecture, evaluations, referred to as *Gyosei Hyoka* (government evaluations), boomed in Japanese municipalities in the 1990s and improved governmental efficiency and effectiveness. *Gyosei Hyoka* also helped raise awareness of the importance of effective and cost-effective government policies among public officials. The concept of government evaluations as used in the United States means simply "evaluations by government." In contrast, *Gyosei Hyoka* in the Japanese context generally means "evaluations by local governments in relation to administrative reforms."

This definition of government evaluations in local government practice and research as well as the definition used by the Ministry of Internal Affairs and Communications (MIC) differ. First, the term *Gyosei Hyoka* is used in the title of the MIC's Administrative Evaluation Bureau (*Gyosei Hyoka Kyoku*). This *Gyosei Hyoka* of the MIC is often referred to as *Gyosei Hyoka-Kanshi* in Japanese, meaning administrative evaluations and oversight. Second, the MIC conducts a survey of the implementation of *Gyosei Hyoka* by local municipalities about every three years. The broad definition of *Gyosei Hyoka* used in the survey is taken from https://www.soumu.go.jp/main_content/000501750.pdf and reads as follows:

The term *Gyosei Hyoka* in this survey is defined as judging the relevance, achievement and results of policies, measures and administrative programs, regardless of whether they are implemented before, during or after the event, based on certain criteria and indicators. The scope

of policies to be covered corresponds to the scope of policies of 'policy evaluations' in the national government level and 'Administrative Program Review (*Gyosei Jigyo* Review)' of the central government.

These two uses differ from the concept of *Gyosei Hyoka* in the study of local administration and its practice. *Gyosei Hyoka* were often adaptations of the evaluation methods used by private enterprises. They tended to ignore the organizational differences between public and private entities. Japanese academic supporters of *Gyosei Hyoka* often introduced methods that had been successfully implemented by private enterprises into municipal governments without carefully considering the differences. The lack of attention to these differences may have had unintended harmful consequences, such as evaluation fatigue related to the large amount of paperwork involved in these activities.

This study analyzed the opinions of public officials managing municipal *Gyosei Hyoka* by using primary national-level survey data on implementation and problems related to government evaluations in cities and towns/villages. The national survey on towns and villages was conducted in 2015, and its data were compared with those of a survey conducted on cities in 2014 (Moteki, 2015). This paper discusses government evaluations in Japan at the municipal level using survey data gathered by the author in 2014 and 2015 in addition to the definitions and status of government evaluations in the Japanese context. This paper has four parts. A review of the literature on the evaluation methods used by Japan's municipal governments is followed by a description of the survey methods used in this study. A comparative analysis of the 2014 and 2015 surveys is presented next. The conclusion summarizes the differences between the cities and smaller municipalities, and I argue that smaller municipalities

have to tailor their evaluation methods to meet their needs and human resources.

(2) Literature review

Several quantitative studies of government evaluations in Japan have been conducted. Japan's Ministry of Internal Affairs and Communications conducts a mail survey (Status of Government Evaluations in Local Municipalities) of all municipal governments, including prefectures. These surveys are carried out once every three years, and the response rates are very high (e.g., the response rate in the 2016 survey was 100%). However, the reports are limited to tabulations of responses, although the raw data from the individual answer sheets of each respondent are available in Excel format (Ministry of Internal Affairs and Communications, 2017). The ministry has not analyzed trends, patterns, or other changes over time.

Tabuchi (2010) analyzed the 2009 survey data collected by Mitsubishi Research Institute. These surveys were carried out from 1998 until 2009 to clarify the state of municipal governments' administrative evaluations. Tabuchi (2010) summarized the survey findings across time and organized the evaluations into four stages, each lasting roughly three years. As the timing differed across municipalities, "the municipalities introducing the evaluation system are mixed on the four stages" (Tabuchi, 2010, p. 33). They faced various challenges, including finding ways to eliminate the burdensome feeling of engaging in the evaluation work, ways to use the evaluation results, and ways to move away from evaluations performed by the government alone.

Other papers and reports based on survey data mostly reported simple tabulations of the questionnaire item responses. The relationships between variables have not been statistically tested. Sato's (2013a) cross-sectional survey of Japan's municipalities in 2012 (excluding prefectures, towns, and villages) aimed to

clarify the structure and function of government evaluations for the administrative management system. The 810 municipalities included the Tokyo Metropolitan District and had a response rate of 73.8%.

According to Behn (2003), public managers measure performances in order to evaluate, control, budget, motivate, promote, celebrate, learn, and improve. Among these reasons, *Jimujigyo Hyoka* in municipal governments has been focused toward making improvements in the budget mostly because of financial crises. Other program evaluation methods (particularly the logic model) that are considered important by the American Evaluation Association (AEA) are not widespread in Japan.

Noutomi and Nakanishi (2007) analyzed the characteristics of NPM reform movement started in the mid-1990s in Japan's municipal governments by focusing on performance budgeting, total quality management, and target-based budgeting. They concluded that the performance measure used by the municipal governments was similar to conventional budgetary control. However, implementing a performance measure led to the diffusion of the notion of program evaluation, including logic models, which is an ongoing process. The Ministry of Internal Affairs and Communications recently added this to the national training in policy evaluations for government officials. Uchida (2009). Uchida (2009) discusses the disruptions that NPM-type government evaluations cause to small municipalities. This study's questionnaire of the survey also focuses on small municipalities and aims to identify differences in the situation between small and large municipalities.

(3) Government evaluations in Japan

Gyosei Hyoka is Japan's main evaluation tool. Although it is sometimes interchangeably used with *Seisaku Hyoka* (policy evaluation), the latter mostly indicates evaluation activities in the central government,

usually comprising scientific policy evaluations. *Seisaku Hyoka* has three aspects: the *Jigyo Hyoka* (project evaluation), the *Jisseki Hyoka* (performance evaluation), and the *Sogo Hyoka* (comprehensive evaluation) (Koike et al., 2007).

Gyosei Hyoka usually concerns municipal governments and is often about government downsizing or inefficiencies. It has two approaches: (1) *Jimujigyo Hyoka*, which uses benchmarking and policy indicators for public works' (infrastructure) evaluations; and (2) *Gyomu Tanaoroshi* (work process analysis), started by the Shizuoka Prefecture under the guidance of Professor Kitaoji of Meiji University in FY 2003. The dominant methods of evaluation used by the *Gyosei Hyoka* of municipal governments is the *Jimujigyo Hyoka* Cross-sectional Program Evaluation System.

Jimujigyo Hyoka became popular in Japan mainly in response to the United States' 1993 Government Performance and Results Act (GPRA) and the reinventing government movement (Osborne & Gaebler, 1992). The GPRA triggered a boom in government evaluation activities in the United States. Since the GPRA Modernization Act of 2010 (GPRAMA), federal departments and agencies have developed strategic plans, goals, and indicators to implement the GPRAMA. A system for evaluating and improving policies based on these indicators was introduced. In 1996, Mie Prefecture was the first Japanese municipality to implement *Gyosei Hyoka* based on the US experience, and other Japanese municipalities followed suit. Eventually, *Seisaku Hyoka* was implemented at the national level through the Government Policy Evaluations Act (Act No. 86 of 2001; Act 86).

Along with the law, policy evaluations by the central government have been governed by the Standard Guidelines for Policy Evaluation published by the Government Council for Policy Evaluation in 2001. The roles of each ministry's managing department are

described in Section 1 under Chapter 3. Two of the five roles are “planning and formulation of basic matters related to policy evaluation of administrative work in charge (development of implementation guidelines and management policies for evaluation implementation)” and “promotion of training and securing human resources capable of policy evaluation.” Training people to be policy evaluators is an important foundation for achieving effective evaluations; however, only one study on evaluators’ competencies has been conducted in Japan (Sato, 2013b). The Ministry of Internal Affairs and Communications regularly conducts trainings on policy evaluation methods for both national and municipal public officials. National-level trainings take place in Tokyo, and municipal-level trainings are held in regional central cities. It is not easy for municipal officials to participate because the venues, Tokyo or the central regional cities of each area, are located far from local municipalities.

Yamaya (2002) pointed to academic research and government practices while focusing on the influences of the evaluation methods used by private enterprises on government evaluations and argued that policy evaluation in Japan “has been ‘evaluation’ far from the model drawn by the theory of evaluation” caused by the lack of “interpersonal exchanges” between academics and practitioners (p. 337). Yokoyama (2009) proposed that when the policy evaluation system began in municipalities in the 1990s, its main purpose was administrative reform. She used *Nihon Keizai Shimbun* (a Japanese newspaper) data to analyze the relationships between implementation by municipalities and possible predictors such as the extent of administrative reform. Two of these variables were “the introduction of evaluation systems” and “making the balance sheet, evaluation results, and committee meeting minutes publicly available.” She found a statistical relationship between the independent variables and “improvement of administrative services.”

Gyosei Hyoka became closely linked to management reform and was significantly influenced by the management practices of private enterprises. Former automaker employees employed at government offices were often asked to help guide administrative reforms and improvements. Private enterprise management tools were directly applied to improve governmental operations, perhaps related to the NPM movement. Applying the practices of the private sector contributed toward the dissemination of *Gyosei Hyoka*, the gaps between the evaluations being used and program evaluation theory, and the evaluation fatigue and formalization (ritualization) of the systems.

Gyosei Hyoka by municipal governments often related to efficiency through *Gyosei Keiei* (public management) and *Gyosei Kaikaku* (administrative reform). However, it is not clear whether the evaluations benefitted the public officials or the stakeholders. Observations in the current study revealed that implementation was a heavy burden on public officials in the central evaluation departments because evaluations at the municipal level tended to be challenging for the officials on account of negative public opinion of government and public demand for efficiency. The public and stakeholders tended to mistakenly perceive evaluation as a means of achieving administrative reform by reducing waste in public expenditure. Some business management scholars persistently argue that business theory may easily apply to public administration, which encourages this type of misunderstanding. Ueyama (1998), considered as one of the most influential authors by practitioners and citizens, wrote “*Gyosei Hyoka*” *no Jidai (Era of Gyosei Hyoka)*. The subtitle of this text is “Perspectives from Management and Customers.” In short, *Gyosei Hyoka* in Japan seems overly focused on efficiency and on downsizing administrative organizations. As Yamaya (2002) explained, *Gyosei Hyoka* is very different from the original notion of program evaluation accepted

around the world and the concept of “government evaluation” used by western academic societies, including the American Evaluation Association, the Canadian Evaluation Society, and the European Evaluation Society.

Many Japanese public officials have recently come to emphasize on *Hyoka Zukare*, a negative aspect of government evaluation, which means “evaluation fatigue.” This and another similar term, “evaluation exhaustion,” has come to be used by the Organisation for Economic Co-operation and Development (OECD, 1997). Blackmore (2003) argued that the problem of evaluation exhaustion exists among students as well. A previous study on program evaluations pertaining to international comparison focused on Sweden (Johnsen, 1999). Furthermore, there have been studies by Lahey and Nielsen (2013), who have presented the Canadian case, and Arthur et al. (2012), who have examined performance auditing in Norway.

Although many Japanese municipalities have evaluated programs based on *Jimujigyo Hyoka* under the name of *Gyosei Hyoka*, some practitioners and researchers have been pointing out at the negative effects concerning the costs of the systems and the side-effects on staff, such as evaluation fatigue (Sawada, 2010). Consequently, the logic model is attracting attention as a framework for visually grasping the logical relationships between the overall goals (mission) and the activities implemented (programs). Logic models are increasingly being used by municipalities to improve *Jimujigyo Hyoka*. For example, in FY 2013, the Ministry of Internal Affairs and Communications held lectures on logic models as a part of national training in policy evaluations for practitioners. It focused on logic model theories and their application. In FY 2014 and FY 2015, the logic model became a theme for the national-level training in Tokyo.

(4) Evaluation exhaustion and evaluation anxiety

Discussions in Japan on the negative aspects of evaluation are common. Recently, evaluation fatigue has been considered a problem of *Gyosei Hyoka* in Japan. Evaluation exhaustion as a negative outcome receives little attention in other countries. Until recently, evaluation anxiety was mostly linked to testing and learning anxiety in pedagogy. Blackmore (2003) is one of the few scholars who was interested in evaluation fatigue as a broad academic topic. The OECD (1997, p. 23) has referred to “evaluation exhaustion” in the context of scientific research evaluation.

The concepts are important because the behavioral and psychological results of evaluation anxiety among officials under evaluation create psychological and temporal burdens for the entire municipality, including evaluators and the central divisions of evaluation activities, especially after the dissemination of the evaluation systems when the original meanings of evaluations become unclear. After the booms of the introduction, the burden on officials was focused among the Japanese municipalities. Related to the concept, the adverse effects of the excessive evaluation anxiety were discussed in the *American Journal of Evaluation* (Donaldson et al., 2002).

Evaluation anxiety entered Western scholarship in about 2000 (e.g., Bechar & Mero-Jaffe, 2014; Donaldson et al., 2002; Taut & Brauns, 2003). Donaldson et al. (2002) described the nature of evaluation anxiety and the excessive evaluation anxiety being addressed in the United States and Europe, concluding that “evaluation anxiety refers to the set of (primarily) affective, and also cognitive and behavioral responses that accompany concern over possible negative consequences contingent upon performance in an evaluative situation” (p. 262). According to these scholars, excessive evaluation anxiety is a response to an excessively anxious situation.

The following analysis of surveys does not deal directly with these concepts. However, it discusses how the

significance of government evaluations in Japan has been challenged since the initial introduction of the systems by the local government more than 20 years ago and how each aspect of the systems has changed.

(5) Methods

1 Nationwide surveys of Japanese Cities

This study analyzed data on Japanese municipalities derived from surveys conducted by the author and Hiroshima University in 2006, 2014, and 2015. The 2006 and 2014 surveys (Nationwide Survey of Japanese Cities Regarding Government Evaluations) were on city municipalities in Japan, and the 2015 survey investigated town and village municipalities (Nationwide Survey of Japanese Towns and Villages).

Nationwide Survey of Japanese Cities Regarding Government Evaluations, 2006

In 2006, the survey of cities was conducted in October. As of January 2006, there were 764 cities in Japan, excluding the ordinance-designated cities such as Osaka, Nagoya, and others. The targets of the survey were 764 city officials. The response rate was 71.1% ($n = 543$). A summary of the 2006 survey results was published in the *Regional Economic Studies* of Hiroshima University (Ito, 2007). The following tables referring to the 2006 survey use the data of Ito (2007).

Nationwide Survey of Japanese Cities Regarding Government Evaluations, 2014

In 2014, the author conducted the survey of cities in November and December. As of January 2014, there were 790 cities in Japan, including ordinance-designated cities. The targets of the survey were 790 city officials. The response rate was 65.1% ($n = 514$). A summary of the 2014 survey results was published in a Japanese journal (Moteki, 2015).

2 Nationwide Survey of Japanese Towns and Villages

Data on smaller municipalities were collected via mail in 2015. In November, questionnaires were mailed to all legally designated small municipalities (745 towns and

183 villages as of April 1, 2015) asking about their government evaluation practices. The questionnaire comprised 26 closed-response questions, some of which had follow-up questions, and 4 open-ended questions. By the deadline (December 25, 2015), 396 valid questionnaires had been returned (response rate of 42.7%).

(6) Results

1 Implementation of government evaluations

Tables 1 and 2 show the population distributions of municipalities. The towns and villages were most likely to have 10,000 to 19,999 residents ($n = 129$, 32.7%), followed by those with 1,000 to 4,999 ($n = 87$, 22.1%). The cities were most likely to have 30,000 to 49,999 residents ($n = 113$, 22.0%), which was closely followed by those with 100,000 to 199,999 ($n = 108$, 21.1%) and those with 50,000 to 69,999 ($n = 107$, 20.9%) residents.

Table 3 shows that 84.6% of the cities were engaged in implementing *Gyosei Hyoka*. About 37.4% of the smaller municipalities were engaged in conducting *Gyosei Hyoka* and about half (49.2%) of them were not, which was markedly different from the situation among the cities. Figures 1 and 2 show the years in which the municipalities introduced *Gyosei Hyoka*. The most common period was 2004 through 2007 for cities and

Table 1 Population Distribution of Cities in the Nationwide Survey of Japanese Cities on Government Evaluations, 2014

Level	Count	Ratio
Less than 30,000	43	8.4%
30,000 to 49,999	113	22.0%
50,000 to 69,999	107	20.9%
70,000 to 99,999	72	14.0%
100,000 to 199,999	108	21.1%
200,000 to 299,999	22	4.3%
300,000 to 499,999	29	5.7%
500,000 and more	19	3.7%
Total	513	100.0%

Table 2 *Population Distribution of Cities in Nationwide Survey of Japanese Towns and Villages on Government Evaluations, 2015*

Level	Count	Ratio
Less than 1,000	16	4.1%
1,000 to 4,999	87	22.1%
5,000 to 6,999	43	10.9%
7,000 to 9,999	57	14.5%
10,000 to 19,999	129	32.7%
20,000 to 29,999	34	8.6%
30,000 to 39,999	20	5.1%
40,000 and more	8	2.0%
Total	394	100.0%

Table 3 *Implementation of Government Evaluations (Cities and Small Municipalities)*

	Cities (2014)		Towns/Villages (2015)	
	Number of cases	Percentage	Number of cases	Percentage
Implementing	435	84.6	148	37.4
Planning to implement	17	3.3	29	7.3
Not implementing	21	4.1	195	49.2
Suspended or abolished	41	8.0	24	6.1
Total	514	100.0	396	100.0

smaller municipalities. A comparison of the two distributions suggests that implementation in towns and villages occurred a little later than they did in cities.

Table 4 presents the types of evaluations of cities in 2014 and smaller municipalities in 2015. The *Jimujigyo Hyoka* ($n = 356$, 81.8%), Citizen Participation and Citizen Needs Evaluation ($n = 80$, 18.4%), Cost Management Method ($n = 52$, 12.0%), and Benchmarking and Policy Indicators ($n = 43$, 9.9%) were the most common types. Multiple answers were allowed. The *Jimujigyo Hyoka* was implemented in 356 cities, representing 81.8% of the cities that were engaged in implementing *Gyosei Hyoka*. *Kaizen* Program Total

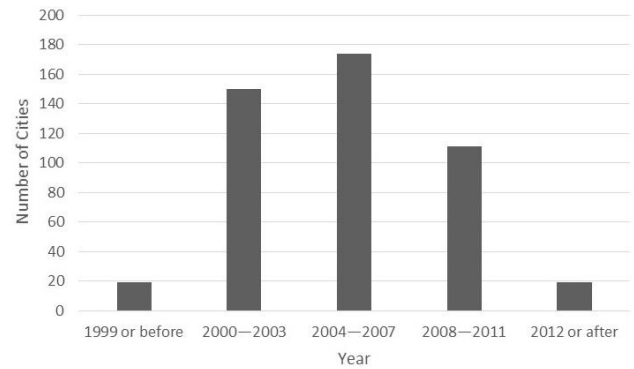


Figure 1 *Introduction of Government Evaluations in Cities (Nationwide Survey of Japanese Cities on Government Evaluations, 2014)*

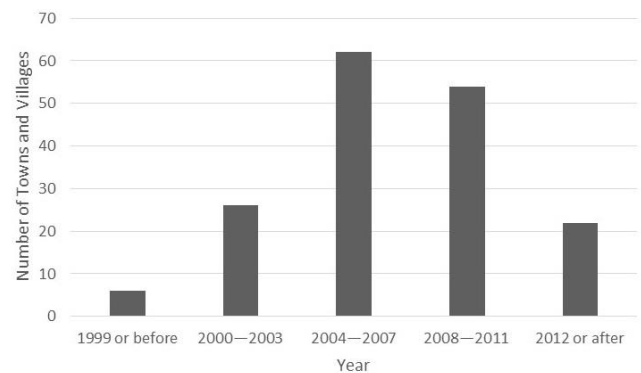


Figure 2 *Introduction of Government Evaluations in Towns and Villages (Nationwide Survey of Japanese Towns and Villages on Government Evaluations, 2015)*

Quality Management Method, also known as Quality Circle, is an effort to examine and discuss ways to improve operations at Japanese automobile manufacturing facilities. The *Kaizen* Total Quality Management Method was implemented in 17 cities, representing 3.9% of the cities that were engaged in implementing *Gyosei Hyoka* ($n = 6$, 4.1% for towns and villages). The *Kaizen* Total Quality Management Method itself is implemented less than other methods.

The concept of *Kaizen* is introduced as *Hoshin Kanri* (policy deployment) in the United States as a Japanese-style method of business improvement (Akao,

Table 4 *Types of Government Evaluations in Cities (2014) and Towns/Villages (2015)*

Cities with Implemented Evaluation Systems (2014; <i>n</i>=435)^a		
Type of system	Number of cases	Percentage of implementing cities
<i>Jimujigyo Hyoka</i> : Cross-sectional program evaluation system	356	81.8
Evaluation of public construction program by municipalities	5	1.1
Benchmarking and policy indicators	43	9.9
Citizen participation and citizen needs evaluation	80	18.4
<i>Kaizen</i> Program Total Quality Management Method	17	3.9
Cost Management Method	52	12.0
Logic models	13	3.0
Other	28	6.4
Towns and Villages with Implemented Evaluation Systems (2015; <i>n</i>=148)^a		
Type of system	Number of cases	Percentage of implementing municipalities
<i>Jimujigyo Hyoka</i> : Cross-sectional program evaluation system	140	94.6
Evaluation of public construction program by municipalities	4	2.7
Benchmarking and policy indicators	13	8.8
Citizen participation and citizen needs evaluation	22	14.9
<i>Kaizen</i> Program Total Quality Management Method	6	4.1
Cost Management Method	12	8.1
Logic models	2	1.4
Other	13	8.8

^aMultiple responses were accepted.

1991). *Kaizen*-related terms such as Management Cycle and Plan Do Check Action (PDCA) Cycle are often mentioned for introducing *Gyosei Hyoka*, including *Jimujigyo Hyoka*. National training in policy evaluations by the Ministry of Internal Affairs and Communications held in FY2019 stressed the importance of the Management Cycle, including the PDCA cycle as functions of *Gyosei Hyoka* in slide materials for E-Learning, Chapter 1 (https://www.soumu.go.jp/main_sosiki/hyouka/seisaku_n/seisaku_forum.html). Some practitioners and researchers in Japan seem to believe that such a PDCA cycle originated in Europe and the United States because these words seem to be English and are abbreviations of alphabets. However, these concepts originated from the *Kaizen* movement in Japan, and the evaluation community in Europe and the United States rarely mention the importance of evaluation by referring to the Management Cycle or PDCA. Yamaya (2016) stated that PDCA, unfamiliar to overseas evaluation practitioners and scholars, has roots in the Japanese-style QC activities *Kaizen* at the production site, emphasized in corporate management.

Jimujigyo Hyoka, the standard evaluation method, is usually intended to be a side-by-side cross-sectional *ex post* (evidence-based) evaluation of all municipal organizations and programs. These *ex post* evaluations use a performance measurement method that differs from program evaluation concepts, which mainly takes an *ex ante* (forecasting) approach to evaluation. The 2015 questionnaire (towns and villages) asked the respondents about when they implemented their *Gyosei Hyoka*. The question allowed for multiple responses, and 94.6% (*n* = 140) of the smaller municipalities that had implemented evaluations (*n* = 148) had followed the *ex post* approach, whereas 18.0% (*n* = 31) conducted evaluations during their programs and 25.0% (*n* = 43) implemented evaluations before their programs began.

As for the frequency with which municipalities

conducted evaluations, almost 90% of cities and smaller municipalities conducted annual evaluations (Table 5). About 4.9% of the cities implemented biannual evaluations, compared with only 2.3% of towns and villages, suggesting differences between cities and smaller municipalities in terms of personnel and other resources allocated to evaluation activities.

Table 5 *Frequency of Government Evaluations*

Variable	Cities (2014)		Towns/Villages (2015)	
	Number of cases	Percentage	Number of cases	Percentage
Biannual	23	4.9	4	2.3
Annual	424	89.8	151	87.8
Biennial or triennial	13	2.8	4	2.3
Other	12	2.5	13	7.6
Total	472	100.0	172	100.0

Table 6 indicates the reasons why 248 towns and villages had not implemented evaluations. The respondents had seven options, and they were allowed to choose multiple reasons. The most common reason was the lack of resources for evaluation, which was chosen by 94.9% of the municipalities, followed by the lack of knowledgeable staff, which is also a resource. These results indicate that towns and villages could not easily implement evaluation systems because they lacked the necessary resources to do so.

2 Reasons to abolish or suspend government evaluations

Table 7 presents the reasons why municipalities abolished or suspended government evaluations. The most common reason was that the evaluations involved too much work (43.9% of cities and 24.0% of smaller municipalities).

3 Intentions to enhance government evaluations

The 2006 and 2014 surveys of cities also asked about the

Table 6 *Reasons for Non-implementation of Government Evaluations in Towns and Villages in 2015 (n = 248 Municipalities Not Implementing Government Evaluations)^a*

Reason	Number of cases	Percentage
The municipality is busy managing municipal mergers.	3	1.5
No staff with expertise in conducting government evaluations.	128	65.6
Local governments do not have enough resources to allocate the necessary personnel or to establish organizations to conduct evaluations.	185	94.9
The top official (the mayor) does not perceive a need to conduct government evaluations.	2	1.0
Staff members are resistant to government evaluations.	10	5.1
The effect of government evaluation is not clear.	47	24.1
Other.	11	5.6

^a Multiple responses were accepted.

anticipation of a change in the evaluation system. In 2006, the respondents were most likely to expect to enhance their systems, whereas in 2014 they were most likely to expect to maintain their current level of evaluation. In 2015, the respondents from towns and villages were most likely to expect to maintain their current levels and the distribution of responses was similar to that of cities in 2014. Table 8 presents the similarities and differences across time for cities and between cities and smaller municipalities. In 2006, 78.6% of the cities wanted to expand *Gyosei Hyoka*, but in 2014, it was down to 39.9%. As for towns and villages in 2015, 29.5% wanted to expand *Gyosei Hyoka*, which was lower than what it was in the previous year. The largest item for the column was the intention to maintain *Gyosei Hyoka* (58.9%). To consider the reasons for this increase, I examine the result of Q20 ("Do you think that the government evaluation in your city is

working?") in 2006 and 2014.. In 2014, 1.7% of respondents answered that "It works pretty well" and 45.0% said "It works reasonably well." In 2006, these percentages were 5.1% and 36.5%. The total percentage of local governments choosing either response has thus declined, suggesting that the role played by the government evaluation system in each city is reducing over time. As a result, the number of local governments wishing to expand the system has decreased.

Table 7 *Reasons for the Abolition or Suspension of Government Evaluations in 2014 (Cities) and 2015 (Towns/Villages)*

Variable	Cities		Towns/Villages	
	Number of cases	Percentage	Number of cases	Percentage
Weakens administrative improvements	8	19.5	4	17.4
Requires too much employee work	18	43.9	5	21.7
Change of mayor	4	9.8	3	13.0
Criticism from the local assembly	0	0.0	0	0.0
Other	11	26.8	11	47.8
Total	41	100.0	23	100.0

Table 8 *Intentions to Enhance Government Evaluations: Cities in 2006 and 2014 and Towns and Villages in 2015*

Variable (Intend to...)	2006 (Cities)		2014 (Cities)		2015 (Towns/Villages)	
	#	%	#	%	#	%
Extend/expand	276	78.6	168	39.9	43	29.5
Maintain	64	18.2	208	49.4	86	58.9
Simplify/downsize	21	6.0	45	10.7	17	11.6
Total	351	100.0	421	100.0	146	100.0

4 Reasons for implementing government evaluations

Table 9 compares the reasons for implementing evaluations between cities and smaller municipalities. "Improving fiscal efficiency" was the most common reason and "Increase employees' knowledge" was the next most common among cities and smaller municipalities. However, the city respondents were more likely than those from smaller municipalities to choose the two items regarding citizens, and the respondents from the smaller municipalities were more likely than those from cities to choose "Improve administrative efficiency."

Table 9 *Reasons for Implementing Government Evaluations (Multiple Responses Allowed)*

Variable	Cities (2014)		Towns/Villages (2015)	
	#	% ^a	#	% ^b
Accountability to citizens	213	49.8	48	32.4
Improvement of citizen satisfaction	80	18.7	22	14.9
Increase employees' knowledge	215	50.2	78	52.7
Improve administrative efficiency	133	31.1	70	47.3
Improve fiscal efficiency	217	50.7	115	77.7
Other	22	5.1	3	2.0
Total	880		336	

^aProportion of cities implementing government evaluations ($n=435$)

^bProportion of small municipalities implementing government evaluations ($n=148$)

About half the city and the town/village respondents indicated that one reason for implementing evaluations was to increase employees' knowledge. A secondary question asked the respondents about the aspects of

employees' knowledge that the evaluations were expected to improve (Table 10). "Finances" and "Setting goals and managing policy progress" were particularly important aspects. Respondents from cities were more interested than those from smaller municipalities in terms of citizen satisfaction.

In 2014 and 2015, the respondents were asked about problems with government evaluations. The most commonly reported problems in cities in 2014 were "Results of evaluations are unclear despite the burdensome evaluation activities" and "Quality of contents of evaluation sheets varies across departments and officials in charge," which were indicated by about two-thirds of the city respondents (Table 11, numbers 3 and 9). "Evaluation activities rather than the results are becoming the goal" was considered a problem for more than half the city respondents (Table 11, number 1). The most common problems among the 2015 respondents in towns and villages also were numbers 1, 3, and 9 in Table 11. The percentage of these three items for towns and villages are less than that of

Table 10 *Reasons to Increase Employees' Knowledge*

Variable	Cities (2014)		Towns/Villages (2015)	
	#	% ^a	#	% ^b
Manage finances	170	79.1	64	82.1
Improve citizens' satisfaction	129	60.0	37	47.4
Improve productivity / efficiency	138	64.2	41	52.6
Set goals and manage policy progress	199	92.6	66	84.6
Improve administrative efficiency	4	1.9	2	2.6
Total	640		210	

^aProportion of cities implementing government evaluations ($n=435$)

^bProportion of small municipalities implementing government evaluations ($n=148$)

Table 11 *Problems with Government Evaluations Reported by Cities in 2014 ($n=514$) and Towns and Villages in 2015 ($n=396$)*

No.	Problem	Cities		Towns/Villages	
		n	%	n	%
1	Government evaluation activities rather than the results are becoming the goal.	233	55.7	73	42.4
2	Government evaluation activities are not well known to the public, and there is little response when they are released.	120	28.7	27	15.7
3	Results of government evaluations are unclear despite the burdensome evaluation activities.	277	66.3	86	50.0
4	As it is an internal assessment, it tends to be used to justify budgets and organizational activities.	35	8.4	17	9.9
5	Uniformly dealing with areas suitable for evaluation and areas not suitable for evaluation.	188	45.0	53	30.8
6	It is impossible to compare and evaluate different fields using a uniform method.	89	21.3	30	17.4
7	The mission and purpose of government evaluation is unclear.	56	13.4	14	8.1
8	A government evaluation method is not established.	62	14.8	34	19.8
9	The quality of the contents of evaluation sheets varies across departments and officials in charge.	264	63.2	93	54.1
10	Government evaluation is not relied on for budgeting, reviewing programs, and so on.	114	27.3	18	10.5
11	It is difficult to evaluate programs annually because there are programs that do not produce results within a single year.	25	6.0	11	6.4
12	There is a time lag between organizing government evaluations and budgeting process.	80	19.1	36	20.9
13	As the relationship between government evaluations and administrative oversight performed by local councils is not clear, problems have arisen.	12	2.9	5	2.9
14	Budget changes alone are emphasized, and programs that should be enhanced are ignored.	26	6.2	10	5.8
15	Other:	24	5.7	5	2.9

the cities in 2014. Here, two-sample tests for comparing proportions for number 3, “Results of evaluations are unclear despite the burdensome evaluation activities,” are conducted. The population ratio of the cities is greater than that of towns and villages, statistically significant at the 1% level. The differences between the city and smaller municipalities suggest that the public and the applicability to specific programs were relatively less important problems and applicability to internal finances and lack of a standard method were relatively more important problems in the smaller municipalities.

(7) Conclusion

This study revealed the characteristics and problems of *Gyosei Hyoka* in Japanese municipalities. The dominant method was *Jimujigyo Hyoka* (Cross-sectional Program Evaluation System), and more than 80% of the municipalities that had implemented evaluations were using *Jimujigyo Hyoka*. Cities tended to implement evaluations first, and the survey data suggested differences between cities and smaller municipalities in terms of implementation and challenges. Some of the differences found were with respect to the implementation rates, reasons for implementation, and the types of problems they were encountering. Thus, smaller municipalities need different approaches towards evaluation. Instead of *Jimujigyo Hyoka*, which significantly demands work requiring specialized human resources, the logic model method may be effective in smaller municipalities for evaluating outcomes and results because it needs fewer resources to accomplish evaluation activities. The logic model method differs from *Jimujigyo Hyoka* in that it does not cover all the programs in principle, but rather concentrates on a specific program. This method was incorporated into the national training in policy evaluation by the MIC from 2013 to 2015. Officers from town and village governments are included in the training and an increasing number of town and village

employees understand the method. In addition, evidence-based policymaking systems, which are attracting attention in Japan, sometimes incorporate the logic model method as a component (as is the case in Hiroshima Prefecture).

One important finding was that the smaller municipalities were relatively less interested in conducting government evaluations because of their limited resources. Fiscal constraints tend to limit the number of public officials in small municipalities, and those officials tend to lack the expertise needed to conduct evaluations. Thus, officials in relatively small municipalities need focused training to obtain the skills necessary to implement evaluations.

One of the major limitations of this study is that it took four years to write this paper in English after the survey conducted in 2015 and the conference presentation in the United States in 2016, partly because of the author's intra-university transfer. Hence, this study was unable to capture the changes in these five years. The MIC report published in June 2017, which examined the situation in each municipality as of October 1, 2016, is the latest result of the government's research. According to this research, the number of cities and Tokyo's 23 special wards implementing government evaluations increased slightly from 82.8% in 2013 to 83.5% in 2016. By contrast, the percentage of towns and villages increased by four percentage points from 34.9% in 2013 to 38.9% in 2016, but it is still below 40%.

The report of the MIC survey published in 2017 examines why no government evaluation was planned to be introduced. The small size of the local government and its difficulty in organizing staff to implement the evaluation (*Taisei ga Torenai*) was the most common answer (61.0%), followed by that no evaluation method and criteria have been established (31.4%). These results are in line with the findings of this study. In the recent literature, two studies dealing with municipal

government evaluations published after 2017 have included the word restructuring (*Sai-kochiku*) in their titles. Future work should aim to research this topic again by reviewing and replacing some of the question items used in this survey to understand the current trend of municipalities abolishing, reintroducing, and significantly revising government evaluation systems.

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Clarification of characteristics required for cost information: Building a framework of “Cost information quality”

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Abstract

This study clarifies and deciphers characteristics required for cost information. It is not sufficiently clear why characteristics other than accuracy are required, despite their importance being suggested. It is because previous studies have focused mainly on accuracy, and empirical evidence on other characteristics is limited. To explore the requirements of cost information in the usage phase, this study building a framework of “Cost information quality” using the concept of information quality from information systems theory. Concretely, based on Wang and Strong (1996), cost information quality is assumed to composed of four quality dimensions: intrinsic, accessibility, representation, and context. A field study presented in this paper confirms that multiple characteristics are required in the case organizations. Moreover, required characteristics depend on the purpose of use and organizational contexts. As the main contribution, this paper demonstrates the existence of a variety of characteristics required for cost information. This study confirms that the accuracy is intentionally reduced to ensure usefulness of information due to a trade-off with other characteristics. Therefore, the study highlights the importance to provide high quality cost information with various characteristics including but not limited to accuracy.

Keywords

Cost information, Cost accounting, Information quality, Accounting information, Field study

(1) INTRODUCTION

The purpose of this study is to clarify and decipher the characteristics required for cost information. Companies use cost information for various purposes, and previous studies discussed its usefulness. Recent studies have focused on overhead cost allocation and accuracy (Arai et al., 2010; Brierley, 2008). Accuracy of cost information is the realistic reflection of management and production costs. Accurate

cost information can be provided only by sophisticated costing that appropriately maps daily activities and causal flows (Horngren et al., 2015; Kataoka 2011). Since traditional costing is criticized for being less accurate and encouraging erroneous decision making, previous studies elucidated factors improving accuracy and impacts of accurate costing (Kataoka, 2011). Activity-Based Costing (ABC) intended to improve accuracy through a greater number

of activity cost centers (Drury, 2015, p.311), became one of the main topics in management accounting research in the 1990s. However, ABC is not widely used in practice, and the results of studies on the effects of ABC are not consist (Gosselin, 2006).

However, some studies demonstrated the importance of characteristics other than accuracy. Brierley (2008) found that characteristics such as understandability and completeness are required, suggesting a problem in previous studies focused on accuracy. Pizzini (2006) found that the level of detail and frequency of reporting affected the usefulness of cost information. Other studies suggested the importance of rapidity and relevance.

Previous studies have some limitations. First, we have little known how and why characteristics other than accuracy are required. As previous research has been focused on accuracy, empirical evidence on other characteristics is limited. Second, in studies that focused on characteristics other than accuracy, such as Brierley (2008), there is no clear understanding of the characteristics required for cost information because the relationship between characteristics of the cost information is unclear. Some characteristics, including completeness and detail or relevance and decision usefulness, may have inclusive or causal relationships. However, since studies based on various theories and used several dependent variables, it is difficult to organize the relationships between the characteristics discussed in previous studies. Additionally, previous studies focused on specific characteristics independently, but it is necessary to clarify the relationship between these characteristics, as there may be cases where characteristics are required simultaneously. Therefore, we should clarify

empirically the characteristics required for cost information and why those characteristics are required, based on a framework including multiple information characteristics.

This study achieves this research question through two steps. First, this study builds a research framework based on information quality (Section 2), which measures conformity of information with requirements. Previous studies clarify the characteristics required of management information. This framework allows to organize and investigate a variety of characteristics. Second, this study conducts a field study (Section 4) and empirically confirms the characteristics required for cost information and their determinants (Section 5).

(2) BUILDING A FRAMEWORK

1. Information quality

According to Lee et al. (2002), Sekiguchi (2013), and Yakuwa (2010), information quality is defined as "fitness for use" and means the degree to which management information provided is consistent with requirements. The technical model, which had received a lot of attention in information systems theory, could not show what useful management information is, and researchers realized the importance of other aspects of information accuracy and technics of management systems.

This study is based on Wang and Strong's (1996) information quality model¹. This model measured and evaluated information quality by presenting the characteristics required for management information in a comprehensive and systematic manner. Concretely, it showed that information quality has four quality dimensions, and they can be measured and evaluated by the consistency of the

¹ Although Wang and Strong (1996) describe it as "data quality," we discuss it as "information quality" in this study. According to Sekiguchi (2013, pp.28-39), information is the addition of knowledge and meaning to data. Therefore, in Wang and

Strong (1996), information corresponds to data, because it includes characteristics related to knowledge and meaning, such as ease of understanding. They later use the terminology of information quality (Lee et al., 2002); therefore, there is no problem.

information used with the requirements for lower characteristics that make up each quality dimension. For example, if the management information meets the requirements for conciseness and understandability, which are sub-characteristics of "representational quality dimension," it can be evaluated as "representational quality is high." These four quality dimensions will be discussed later in subsection 3.

2. Modeling cost information

Wang and Strong's (1996) model contributes to the study of cost information for two reasons. First, it is based on a large-scale survey and careful statistical analysis; therefore, its structural concepts are comprehensive. Hence, using this model provides a broad view of research on cost information. This enables us to discover characteristics that have not received much attention in cost information research.

Second, the systematic nature of the model overcomes the unclear relationships between characteristics presented in previous studies, as they did not have a unified framework and developed in various ways. This model organizes characteristics required of information in four dimensions, making it possible to organize the findings of previous studies.

3. Cost information quality and its component dimensions and sub-characteristics

In this study, the concept of information quality is used to measure the conformity to requirements of cost information in the usage phase, which is called "cost information quality." High quality cost information meets user requirements.

Furthermore, this study relies on Wang and Strong's (1996) information quality model to elucidate the characteristics that constitute cost information quality. Cost

information quality is assumed to consist of nine sub-characteristics in four dimensions: intrinsic, accessibility, representational, and contextual quality dimension² (Table 1). To fit this model to cost information research, each quality dimension and the implications of each sub-characteristic are discussed, based on previous research on cost information.

Table 1: Cost information quality, component dimensions, and sub-characteristics

Sub-characteristics	Examples of Prior Research
Intrinsic quality dimension	
accuracy	ABC studies and many others.
objectivity	Myers et al. (2017)
Accessibility quality dimension	
ease of access	—
ease of operation	—
Representational quality dimension	
understandability	Brierley (2008)
conciseness	Cardinaels (2008)
Contextual quality dimension	
relevance	Mia and Chenhall (1994)
completeness	Pizzini (2006)
timeliness	Chenhall and Morris (1986)

3.1 Intrinsic quality dimension

The intrinsic quality dimension, i.e., the numerical dimension of information, is assumed to be composed of two sub-characteristics: accuracy and objectivity.

The accuracy of cost information means the values of cost information realistically reflect the actual situation of management and production. Some argue that inaccurate cost information, based on the allocation calculation that deviates from the actual management situation, leads to erroneous decision making (Datar and Gupta, 1994), and its importance has been elucidated mainly in ABC studies.

² Among the sub-characteristics included in Wang and Strong (1996), reliability, reputation, value-added, interpretability, consistency, and safety are excluded, as they

are judged to be of little relevance in cost information or are encompassed by other sub-characteristics.

The objectivity of cost information means that cost data are not biased and arbitrary. Arbitrary allocations and subjective estimates reduce the reliability of cost information. Myers et al. (2017) found that informal cost information without the approval and monitoring of the IT department is not used often, even if the results of the calculations are the same due to low objectivity and verifiability.

3.2 Accessibility quality dimension

Accessibility quality dimension, i.e., the dimension related to the convenience of using the information, consists of ease of access and ease of operation. Ease of access of cost information means users can retrieve information without hassle. For example, the usefulness of the cost information to make managerial decisions is low if managers must go through complicated procedures to obtain information. Managers are not willing to use the cost information if such complicated procedures are present.

Ease of operation of cost information means ease of process such as aggregation, extraction, and transfer of cost information. For example, when making decisions, managers need to divide costs into relevant and sunk costs, or to classify costs. Therefore, when cost information is difficult to aggregate, the operability of the cost information is poor, and its usefulness is remarkably low.

3.3 Representational quality dimension

Representational quality dimension, i.e., the dimension relating to the format of information, consists of understandability and conciseness.

Understandability of cost information means the presentation style is such that users can easily comprehend the meaning and background from cost information. Brierley (2008) demonstrated the importance of understandability, and some studies showed that its usefulness is enhanced by setting up cost drivers and cost pools that are understandable for manufacturing managers who may not be so familiar with accounting (Hiromoto, 1988;

Merchant and Shields, 1993).

The conciseness of cost information means the format of cost information is straightforwardly organized. Cardinaels (2008) showed that providing concise graphical cost information based on users' accounting knowledge improved decision making. Moreover, accounting information overload reduces the quality of decision making (Chewning and Harrell, 1990).

3.4 Contextual quality dimension

The contextual quality dimension, i.e., the dimension of fit with the user's task, consists of relevance, completeness, and timeliness.

The relevance of cost information means a suitable and sufficient range of information is provided for users. The importance of reporting an appropriate range of cost information for users has been demonstrated by previous studies. Different ranges of cost information are not useful, because ranges in cost information have appropriate accounting units and periods for each user. The scope of accounting information determines the usefulness of the information (Mia and Chenhall, 1994).

The completeness of the cost information means the required data, without omission, are present in the cost information. Even if the relevance is adequate, if the comprehensiveness and detail of the information is not, usefulness is low. For example, Pizzini (2006) shows that detailed cost information enhances managers' decision making, and Brilery (2008) found that many management accountants consider it important to calculate all cost items of product costs comprehensively.

The timeliness of cost information means cost information is available when appropriate for users. The importance of timeliness of accounting information has been noted by previous studies (Gullberg, 2016) and is defined by appropriate reporting frequency and speed for users (Chenhall and Morris, 1986). The importance of timeliness has been empirically elucidated (Pizzini, 2006), and

the provision of cost information with appropriate frequency and speed for the user's task is required.

4. Provisions by decision-making environment and purpose of use

To elucidate why various characteristics of cost information are required, this study employs the decision-making environment and purpose of use as determinants of the cost information quality from previous studies.

4.1 Cost information quality and decision-making environment

Previous studies on cost information and information quality suggest a close relationship between the decision-making environment and cost information quality. The uncertainty and complexity of the decision-making environment lead to accuracy requirements and elaboration of allocations (Abernethy et al., 2000; Al-Omiri and Drury, 2007; Watanabe, 2000.). For information quality, studies showed that the quality of management information differs depending on the organization's situation, such as the decision-making environment (Sekiguchi, 2013; Petter et al., 2013).

Therefore, this study assumes that the requirements for and actual levels of the quality dimensions, which constitute cost information quality, differ depending on the uncertainty and complexity of the decision-making environment.

Uncertainty in the decision-making environment is defined as "the variability of factors that must be taken into account in decision making and the uncertainty of information about those factors" (Tani et al. 1993, p.76). Previous studies have focused on the degree of market competition, the frequency of new product development, and the difficulty of predicting the market environment. In such an environment, the importance of cost information increases due to difficulty in forecasting demand, high opacity of production plans and cost estimates, and large cost fluctuations.

Complexity in the decision-making environment is defined as "the number and

heterogeneity of factors that must be considered in decision making" (Tani et al. 1993, p.76). Previous studies focused on the diversity of products and services handled and of manufacturing technologies and processes. In such an environment, cost items and objects of costing become diverse as the management objects, such as processes, divisions, products, and services, become complex. Therefore, detailed and diverse cost information is essential.

4.2 Cost information quality and purpose of use

There is a close relationship between quality of cost information and purpose of use, leading to the maxim, "different costs for different purposes." Previous studies on costing showed that accuracy requirements and allocation elaborations vary depending on the purpose (Schoute, 2009). Research on information quality indicated that not all information characteristics are equally required in all situations (Sekiguchi, 2013). The importance of each information characteristic varies depending on the purpose of use.

Therefore, this study assumes that the requirements for the quality dimensions, which constitute cost information quality, differ depending on the purpose of use.

Following Drury (2015) and Horngren et al. (2015), this study divides the purposes of use into management decision-making purposes and planning and control (P&C) purposes. The management decision-making purpose includes decisions on pricing and product mix and decision on self-manufacturing or subcontracting. The P&C purpose includes cost management, cost improvement, review of production plan, and performance evaluation.

5. Research framework and research question

As the purpose of this study is to clarify the characteristics required of cost information and the reasons, the concept of information quality is used to explore conformity with requirements of cost information in the usage phase, defined as

"cost information quality." Based on Wang and Strong (1996), cost information quality is assumed to constitute of four quality dimensions: intrinsic, accessibility, representation, and context. The decision-making environment and the purpose of use (management decision-making purpose and P&C purpose) affect the requirements for cost information quality and levels of the requirements.

However, these discussions are just assumptions. It is unclear how each characteristic is affected by the decision-making environment and the purpose of use. Therefore, this study empirically explores the research framework and addresses the following research questions (RQ).

RQ: How are the four quality dimensions constituting cost information quality affected by the decision-making environment and the purpose of use?

(3) RESEARCH DESIGN

We conducted a field study with semi-structured interviews. A field study is useful for elucidating RQs such as "why and how" (Yin, 2002) and allows this study to explore complex relationships for multiple variables.

The research sites are large companies in the materials industry in Japan to investigate the use of cost information for each purpose of use, including price determination. The use of cost information in price determination is limited to finished product manufacturers, as they have strong pricing power in the market. Therefore, we focus on the materials industry, where price determination is based on price negotiations between companies.

Three companies that agreed to be interviewed were selected as the research sites. We randomly sent out research request letters to firms matched the above conditions. In order to avoid increasing excessively in the number of companies agreeing to be interviewed in a short period, we divide the candidate companies into groups of about 10 companies and send them out at an interval of about two weeks until the number of

companies agreeing to be interviewed reaches three or four. We sent letters to 30 companies (7 companies responded, and 3 companies cooperated).

The interviewees were managers in the accounting department, as they are familiar with cost accounting and the preparation and reporting of information, and they have contact with many users of cost information and know the purposes and requirements of the information. When possible, plant managers, who are users of cost information, were interviewed to confirm no discrepancies between perceptions of users and providers of the information. We also visited a factory of Company A and observed the meeting. Moreover, we observed internal reporting documents on costs at all firms.

Table 2: Field study Overview

Company	Type of industry	Interviewees	Date
A	Plastic product manufacturing	General Manager, Accounting Department	2016/11/8 2017/5/19
		Plant manager	2018/8/23
B	Steel industry	General Manager, Accounting Department	2016/11/21 2017/8/18
C	Non-ferrous metal manufacturing industry	Manager, Accounting Department	2016/11/25 2017/6/26

Table 2 shows an overview of the field studies. All interviews were conducted in a conference room in the headquarters building, and each interview lasted 60 to 90 minutes. To enhance the objectivity of research, more than one researcher other than the author participated in the interviews. In addition, all contents of this paper were confirmed by interviewees to ensure that there were no factual errors, and all interviews were recorded with permission and later transcribed in writing.

(4) FIELD STUDIES

The results of the field studies showed that the requirements for each quality dimension vary according to the purpose of use (Table 3), and that several quality dimensions are eliminated depending on the

decision-making environment, making it difficult to respond to the requirements.

In this section, we will refer to each quality dimension as "high quality" when the characteristics of the information provided meet the requirements from the users, and "low quality" when they do not. For example, with respect to the intrinsic quality dimension, "intrinsic quality is high" is used when the cost information provided meets the requirements for accuracy and objectivity, which are sub-characteristics of intrinsic quality dimension.

1. The decision-making environment and the purpose of use

1.1 Company A: High Uncertainty and High Complexity

Company A's decision-making environment is considered to be highly uncertain. As the company belongs to the chemical industry, it is under intense competition for new technologies and markets, and new products are developed frequently. It is difficult to predict demand, and most materials are imported. Thus, the environment is subject to drastic changes in raw material costs.

The complexity of the decision-making environment is considered to be high. The number of products per plant exceeds 20,000, and manufacturing technologies are diverse. Furthermore, the manufacturing process is global, and the products are manufactured through complex processes, such as transporting partially finished products to overseas factories for completion.

The Business Strategy Office, a cross-divisional departmental unit, oversees management decision-making, and cost information is used for determining the price of new products and the product mix, and deciding on make or buy. For P&C purpose, the information is reported monthly to executives and plant managers for review to evaluate management and production plans.

1.2 Company B: Low Uncertainty and Low Complexity

Company B's decision-making environment is considered to be low

uncertainty. Since the steel industry is an oligopoly, competition in the market is not high, and demand is predictable.

The complexity of the decision-making environment is considered to be low. The average number of individual products handled by each division is about 10. Product manufacturing is completed in one plant.

As for the purpose of use, each operating division oversees management decision-making and uses the information for price determination, profitability confirmation, and product mix decisions. The purpose of P&C is the same as in Company A and is reported to officers and to each division and plant.

1.3 Company C: High Uncertainty and Low Complexity

The decision-making environment for Company C is considered to be highly uncertain. The non-ferrous metals market has many substitute products and many innovations in production and processing technology, making it difficult to predict demand. Furthermore, the industry depends on imports of raw materials, which are heavily influenced by energy prices and exchange rates, resulting in large price fluctuations.

The complexity of the decision-making environment is considered to be low. The diversity of products produced in one factory is low, because each division has its own factory. The manufacturing process does not cross over multiple plants.

The purpose of use is the same as for Companies A and B. Company C has operating divisions systematized by product, and each division oversees management decision making. The purpose of P&C is reported monthly to executives, operating divisions, and plants managers.

2. Intrinsic quality dimension (accuracy and objectivity)

The intrinsic quality dimension is required for both purposes as the following interviewee said. For the P&C purpose, managers analyze the cost fluctuation

performance accurately. Therefore, understanding the results of the previous month as accurately as possible is necessary. Moreover, accuracy and objectivity are required because cost information is related to performance evaluation. For managers, accurate and objective cost information is required to make decisions accurately.

“There is no doubt that cost information is required to be as accurate as possible. If it's not, sometimes decisions are made incorrectly. (...). It has also impact on internal performance evaluations and personnel evaluations.” (Company A, Accounting Manager)

However, the intrinsic quality decreases for various reasons at each company, each of which is described below.

2.1 Company A: Dilemma due to the decision-making environment

In Company A, intrinsic quality of the cost information varies according to purpose of use. For P&C purposes in the factories, they provided cost information with high intrinsic quality to meet the requirements from the users. Due to environment complexity, where products are diverse, indirect cost allocation is complex. Therefore, by discussing and reviewing the cost drivers with managers every year, cost information is accurate and objective, in line with the production reality.

However, also for P&C purposes, the intrinsic quality of the cost information is low for reports to executives, due to the complex decision-making environment of Company A. The production process of one product spans the globe, and transfer pricing is involved in the cost information between processes. Therefore, it is difficult to monitor the breakdown of product costs throughout the manufacturing process. The accounting department simply simulates the cost structure. Although such a decrease in accuracy is a practical problem, the pursuit of accuracy makes it difficult to achieve timeliness (context quality dimension).

For management decision-making purposes, Company A uses cost information with low intrinsic quality, due to the uncertain decision-making environment. As the following interviewee said, because it is difficult to predict demand and there is a large variation in inventory and capacity utilization, the actual cost of products ranges widely. As the actual cost includes much noise, the operability (utilization quality dimension) is poor for users, and they may make wrong decisions. For example, if the sales department is provided temporarily low cost information because of inventory, they may reduce prices more than necessary. In response, for management decision making, Company A uses “budgetary cost,” which estimates the cost with lower intrinsic quality. The budgetary cost is formulated together with the budget annually. This is based on the actual cost in the medium term and is calculated by breaking down the total production volume for each product by comparing it with the sales plan and the production plan without noise. Once several years, the estimates made at the time of formulation deviate from the actual situation, making it impossible to use budgeted costs.

“The cost information includes the noise of the time, for example, the data at the time of a dramatic drop in operating rates, so if we use the information as it is, we might end up making a wrong decision. Then what is easier to handle is the 'budgetary cost', so we use it (for the purpose of management decision-making in the Business Strategy Office).” (Company A, Accounting Manager)

Table 3. Purpose of use and quality dimensions for each company

Quality dimension		Intrinsic	Accessibility	Representational	Contextual
P&C	Company A	High / Low	—	High	High
	Company B	High	—	High	High
	Company C	High	—	High	High
Managerial decision-making	Company A	Low	High	—	High
	Company B	High	High	—	High
	Company C	Low	High	—	High

“—” indicates no request

2.2 Company B: High quality on both purposes

In Company B, cost information with high intrinsic quality is provided for both purposes. For P&C purposes, sales expenses are allocated based on time spent on sales activities for each product, providing highly accurate cost information that is close to reality.

Intrinsic quality is high for management decision-making purposes. In deciding the price, Company B is asked frequently by buyers to lower the price. Therefore, the company calculates the contribution profit of the product based on the cost information with high intrinsic quality and decides the appropriate selling price, because the price cannot be changes once established.

2.3 Company C: Low quality on management decision-making purposes

In Company C, for P&C purposes, information with high intrinsic quality is used. Highly accurate actual cost information shows each major machine and process in the factory, which is useful for reviewing the production plan and analyzing results. Furthermore, the reports of the heads of business units and executives are similar to those of Company A and B.

However, for the purpose of management decision making, they use cost information with low intrinsic quality based on the system called "individual product cost system." In this system, the breakdown of individual product costs is estimated annually through a discussion among the production control department, operating divisions, and the information system

department, using material and actual costs per process information provided by the accounting department. Since the accuracy and objectivity are low, they are encouraged to check any changes in the situation with respect to material and mold costs when using this information. Additionally, when plants invest in equipment or changes in processing procedures, the structure of cost generation changes significantly, and these costs may deviate from costs at the time of development.

Intrinsic quality decreases for management decision-making purposes, due to the uncertain decision-making environment and the balance with the accessibility quality dimension. For example, if a salesperson wants to check the profitability of a specific product when making a price decision, it is difficult to manipulate the actual cost with high intrinsic quality because of large fluctuations from time to time in the uncertain environment. Moreover, actual cost information with high intrinsic quality is aggregated for each product group. Therefore, it is difficult to extract the cost data related to a specific product, and the ease of operation and accessibility is low.

“In our company, the actual costs for financial accounting (, which is highly accurate,) are aggregated for several product groups. When we talk about the profitability of more detailed individual products, though fabrication processes and materials are different, they are grouped and buried in the cost information, so they are not useful for making decisions on individual products. It is not possible to extract the breakdown data. (...). When we

want to improve the accuracy of each product cost, it is not easy for us to calculate the cost data of all products every month. And for the sales department or operating divisions, it is inconvenient to use highly accurate cost information, which changes every month, because they do not know which cost data to use to make a decision, and their decisions may change. So, we use cost information based on estimates.
 “ (Company C, Accounting Manager.)

3. Accessibility quality dimension (ease of access and ease of operation)

Accessibility quality dimension is required for management decision-making purposes in all companies. As the following interviewee said, this purpose requires cost information that is easy to obtain and operate because other departments use it on an ad hoc basis.

“When a decision must be made on problems, there is no time to look for past cost information, so they need the (cost) information that can be handled immediately when needed. Salespeople and people in the division are busy, so they do not take time and effort to search information. They feel reluctant to check it.” (Company B, Accounting Manager)

Therefore, all companies use information with high accessibility quality for management decision-making purposes. For instance, Company A uses the above-mentioned "budgetary cost." By giving it at the beginning of the year, users have the cost information whenever they need it. In addition, since noise in the cost is eliminated in budgetary cost information, it is easy to extract the appropriate values and is easy to operate. Company C uses the cost information based on the "Individual Costing System," which is easy to operate and obtain. The user can get the cost information of individual products together with the breakdown of material, processing, and transportation costs. This allows sales staff to calculate cost and contribution profit of individual products at any time. It is

useful in price negotiations to decrease price by reducing the number of times rollers are applied.

4. Representational quality dimension (understandability and conciseness)

Representational quality dimension is required for P&C purposes in all companies. To efficiently execute the PDCA (Plan-Do-Check-Action) cycle, cost fluctuations and their causes must be expressed in an easy-to-understand format.

“In the technical sense, the cost figures are almost the same whoever calculate them. What the company is looking for is how we can find the problem and teach them in easy-to-understand ways, when there is something wrong with the figures. If they say, ‘We have no idea what the accounting department talking about,’ we’re out of a job.” (Company B, Accounting Manager.)

“In fact, we spend a lot of effort to have people in our company understand the meaning of cost information. The improvement will not be achieved unless they accept it.” (Company C, Accounting Manager.)

Therefore, all companies use information with high representational quality for P&C purposes. For example, in the report to executives of Company A, the change in cost of each product group and its factors are briefly outlined. In executive management meetings, cost information needs to be reported in a concise and easy-to-understand format, since they need discuss improvement measures for the next period based on various information, such as sales and production. Moreover, Companies B and C use graphs to visualize cost trends and add explanatory notes about variable factors, making cost information easier to understand.

5. Contextual quality dimension (relevance, completeness, and timeliness)

The contextual quality dimension is required for all purposes of use in all

companies. The implications of the sub-characteristics vary depending on the purpose of use. For example, with respect to relevance and completeness, for P&C purposes in Company A's factory, it is useful to report the costs in the factory in detail. It is helpful in reviewing the production plan by reporting the cost of materials input and losses due to yield in detail. However, executive reports only report integrated trends of each product group. Quick and frequent reporting is appropriate for P&C purposes, whereas for management decision-making purposes, the frequency of reporting is annual, and quick reporting is not required.

Therefore, each company uses cost information with high contextual quality by reporting according to the user's task.

"For example, the perspectives of management and factory production are completely different, so it is difficult to observe them all in a uniform manner. We do it while making good arrangements according to the phases." (Company A, Accounting Manager)

(5) DISCUSSION

The research question, "How are the four quality dimensions that constitute cost information quality affected by the decision-making environment and the purpose of use?" is examined based on the field study.

1. Purpose of use and cost information quality

For management decision-making purposes, intrinsic quality (accuracy and objectivity), accessibility quality (ease of access and ease of operation), and contextual quality (relevance, completeness, and timeliness) dimensions are required, while for P&C purposes, intrinsic quality, representational quality (ease of understanding and brevity), and contextual quality dimensions are required.

The intrinsic quality dimension is required for both purposes. In this study, as indicated in previous studies, accuracy and objectivity are important to make correct

decisions. In some cases, intrinsic quality is low for various reasons; however, this is a practical problem. Therefore, the deterioration of intrinsic quality may lead to wrong decisions.

The accessibility dimension is required only for management decision-making purposes, where information is easy to access and operate. Though for P&C purposes, the accessibility dimension is not required. Since cost information for P&C purposes is provided in periodic (i.e., monthly) reports, it does not need to be easily obtained. As it is not necessary to extract specific data from cost information, ease of operation is not important.

The representation quality dimension is required only for P&C purposes. To implement the PDCA cycle, users must understand and accept the meaning of cost information to take actions. It is difficult to understand the meaning of accounting information only by numerical data, thus it is essential to enhance the understandability and conciseness so that managers know the background factors and events, which affected costs. However, for the purpose of managerial decision-making with a specific intention to read the cost information, there is little need to convey the factors and events behind the figures.

The contextual quality dimension is required for both purposes of use. As the maxim "different costs for different purposes" suggests, the required cost range, level of detail, and timing vary depending on the users' department or position. It is useless unless it provides cost information of appropriate scope, level of detail and timing for the user's task. Therefore, relevance, completeness, and timeliness are required.

2. Decision-making environment and cost information quality

The decision-making environment makes it difficult to meet requirements by forcing trade-offs between quality dimensions. First, high environmental uncertainty creates a trade-off between accessibility and intrinsic quality. When the environmental uncertainty is high, it is

difficult to predict demand, and changes in production plans occur often, leading to fluctuations in utilization rates and inventories and increased noise in costs. Hence, if the intrinsic quality is increased, cost information including noise will be provided, which may lead to poor operability and wrong decisions. If the accessibility quality is increased, the intrinsic quality will decrease, leading to use information that deviates from the actual management situation, which may lead to erroneous decisions.

Second, a complex decision-making environment creates a trade-off between contextual and intrinsic quality. With respect to relevance, if the decision-making environment is complex, a problem of indirect cost allocation may occur in aggregating the narrow area costs, such as per product, thus reducing intrinsic quality. However, in aggregating costs over a wide area, such as per business, it is difficult to accurately and objectively aggregate costs across the entire production process (Yasui, 2012) because of difficulty of intervening transfer prices and of headquarters' costs allocation. Conversely, if the intrinsic quality dimension is prioritized, it becomes difficult to provide cost information that is compatible with the user's task, decreasing the contextual quality.

(6) CONCLUSION

This study clarifies and deciphers characteristics required for cost information. Various properties of cost information were assumed based on Wang and Strong's (1996) information quality model. The importance of the characteristics was confirmed through field studies. This study showed that the required characteristics of cost information differed depending on the purpose of use, and the level of these characteristics differed depending on the decision-making environment.

The main contribution of this study is to show the existence of a variety of characteristics required for cost information, using a more extending concept. These findings give a new perspective to research

on costing. This study confirmed that accuracy intentionally reduced to ensure usefulness of the information because of a trade-off with other characteristics. Hence, accuracy is one of many characteristics required of cost information. Therefore, for utilization at various levels, it is important to provide high quality cost information that considers various characteristics.

Additionally, this study contributes to research that focused on characteristics other than accuracy. Using knowledge of management information, this study summarized the characteristics indicated in various previous studies and showed that the requirements for these characteristics vary depending on the purpose of use, including where the decision-making environment of an organization forces the sacrifice of characteristics. Furthermore, this study demonstrated the importance of characteristics, such as ease of access and operation, which were overlooked in previous studies.

This study has some limitations. Access to information users was insufficient. Assuming that middle managers in the accounting department were most suitable, they were chosen as the focus. Yet, further findings may have been obtained by surveying the users of information more widely. In addition, a limitation stemming from narrowing the determinants. Although this study focused on the uncertainty and complexity of the decision-making environment, in which previous research suggested a close relationship, other important contextual factors may exist. Moreover, we could not find case with low uncertainty as a research site. We would like to investigate the case, if possible, and include it in the discussion.

Despite these limitations, the perspective of "cost information quality" provides important suggestions for the research on cost information with respect to the existence of a variety of characteristics. Future research should elucidate the impact of cost information quality and develop an excellent practical theory to enhance each quality dimension.

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