THE CRITICAL SURVEY OF THE PERFORMANCE EVALUATION SYSTEM OF BUSAN DISTRICT DIVISION OF KEPCO : FOCUSING ON THE EVALUATION METHODS

By

Eunseong Jeong

CAPSTONE

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

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ABBREVIATIONS

SOEs -State-Owned Enterprises

KEPCO-Korea Electric Power Corporation

PES-Performance Evaluation System

BDD-Busan District Division

Executive Summary

Introduction

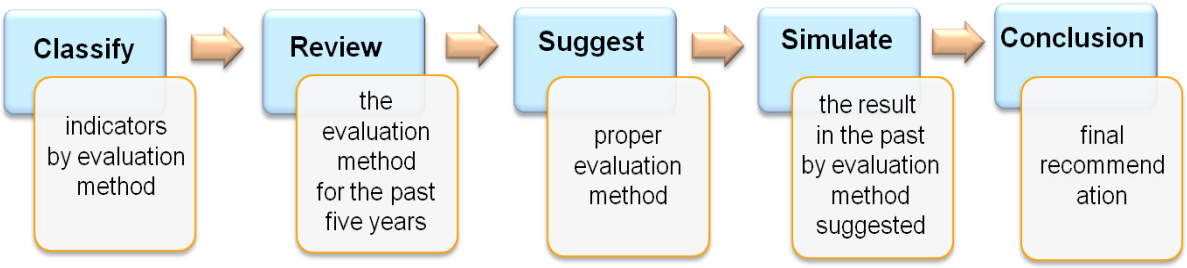
Since the government performance evaluation system for state-owned enterprises is established in 1984, the significance of this system has been growing. It can explain that SOEs are difficult to be efficient and to boost competition only by market system, unlike private company. KEPCO also has enhanced their own performance evaluation system, both the head office and district division level. Considering this trend, we should critically review and improve our system. Moreover, we have experienced problems of the PES that some indicators determined the final result with huge dominant power. In 2009, only three indicators have a huge dominant power that determined the final outcome of evaluation. As a result, there was overheated competition focused on these indicators among branch offices. In 2010, there was less excessive competition. However, one indicator determined the final result with dominant power. Therefore, examining the PES is needed to improve the reasonability o f the system.

Purpose

The purpose of this study is to suggest the adequate evaluation method for the reasonability of the performance evaluation system of Busan district division(BDD) of KEPCO. To achieve this purpose, we raise the question whether the performance evaluation system of BDD have employed the adequate evaluation methods for the reasonability of the system. With this review, we can have a chance to appraise the way that we have implemented the system and set the direction of the PES.

Methods

To critically review the performance evaluation system of BDD and to find the answer mentioned above, this study do the research through the process like the following figure. First, we classified the indicators from 2006 to 2010 by the evaluation method. Second, this study review the evaluation method used in the performance evaluation system of Busan district division. We examine whether the evaluation methods are employed adequately for reasonability of the system, in terms of measurability, distribution, and the balanced weight for the past five years. Third, with the result of the review, we suggest the proper evaluation method that can solve the problem that we found in the process of analyzing. Forth, to prove that this suggestion is correct, this study simulate the adjusted method with the result of evaluation in 2009 and 2010. Based on all results in the process, we will show the final recommendation in last part.



Key Findings

This study analyzes the evaluation method used by BDD of KEPCO from 2006 to 2010 in terms of measurability, distribution, and the balanced weight for reasonability of the PES. As a result, we found some inadequate evaluation method used in system. First, three quantitative indicators ‘collecting the bill, electric quality control, and utilizing facilities, used relative method with the forced discrimination. However, these indicators have no huge distribution in score among branch offices. Therefore, we should examine whether these

small gap is meaningful or not. We find that the relative method might be used inadequately to these three indicators in 2009, without a convincing reason. In respects of the balanced weight, we can find that indicators with relative method, both quantitative and qualitative, have a dominant power. In 2009, three indicators, collecting the bill, electric quality control, and utilizing facilities, determine the final result with dominant power. The evaluation system in 2010 employs the five grades method to all indicators. While quantitative indicators are evaluated by the five grades absolute method, one qualitative indicator is employed the five grade relative method. As a result, only one indicator with relative method has the dominant power to determine the final result.

With the result above, this study suggests five grades method system where qualitative indicator should use the reduced grade gap to control its dominant power.

To prove this suggestion and to show that this method can solve the problem found in the process of analyzing, we simulated the adjusted method with the result of evaluation in 2009 and 2010. In the result of simulation, this study confirmed that the dominant power of indicators evaluated by relative method is reduced.

When we use the grades evaluation method, we should choose the number of grade, the percentage mark, and scale of grade considering distribution of score, the feature of the indicator, and the use of the evaluation result. The deeper and more specific study about this theme will be remained for the further research.

Ⅰ Introduction

Background

With its feature seeking for public interest, state-owned enterprise is hard to be efficient and to boost competition in it only leaning on the market system. As the request for small, efficient, and competitive public sector is growing, Korean government started the performance evaluation system for SOEs in 1984 as one of the solutions. This system guarantees the autonomy of SOEs as well as holds them responsible. In line with the government policy, KEPCO also has established the performance evaluation system of its own. KEPCO use this system to appraise the executive officers, 13 district divisions, and 393 branch offices. This system is implemented at two levels, head office and district division. The head office evaluates their district divisions and other affiliates. District division including Busan district division also appraises the performance of their branch offices. Although the performance evaluation system of district division generally follows the frame of the system of the head office, the PES of district division has its own meaning, in terms of the purpose of the evaluation system. The performance evaluation is aimed to motivate their members to improve the performance and to achieve the goal. In this respects, district division to which more than 80% of members in KEPCO are belong makes their member at work directly.

Busan District division of KEPCO has developed their evaluation system by improving indicators, evaluation methods, period, and so on. As a result, this system shows different features each year. YR 2009 had more relative indicators compared to other years. As a result, only three indicators have a huge dominant power to determine the final outcome of the evaluation. Related with this, there was overheated competition focused on these three indicators among branch offices.

In 2009, KEPCO had first CEO who has worked in private company. He emphasizes efficiency and change. Therefore, he wanted to set the stretched goal and boost competition in PES of KEPCO. That is the reason why those relative indicators were adopted in 2009. With this case, we find that the management philosophy of CEO is one of the important factors influencing the determination of PES. While there was less excessive competition in 2010, one indicator determined the final result with dominant power. During these periods, different evaluation methods are employed. As mentioned above, how to design and implement the evaluation system is very important in terms of the process and result both. Proper evaluation method affects reasonability and credibility of the PES.

Purpose of the study

The purpose of this study is to suggest the adequate evaluation method keeping the reasonability of the PES of BDD of KEPCO. In 2009 and 2010, the performance evaluation system has a problem that some indicators determined the final result with huge dominant power. We begin with an idea that evaluation method causes this problem. In other words, to gain the reasonability of evaluation system, we have to employ the proper method depending on the indicator. For this, we analyze the result of the evaluation for the past five years, focusing on the evaluation method. This study examines the relationship between the result and evaluation method. Based on the result, we suggest the proper evaluation method that acquires the reasonability of the system. In addition, we prove the usefulness of findings with simulation.

Research question

To achieve the purpose of the study, this study raises the question whether the performance evaluation system of Busan district division have employed the adequate evaluation methods for the reasonability of the system. The hypothesis is that the evaluation system should obtain the reasonability by employing the different evaluation methods properly for each indicator.

The significance of the study

The major contribution of this study is to give a suggestion about the evaluation methods in performance evaluation system for BDD of KEPCO.

This study deals with the performance evaluation system of district division, not the evaluation system by government or head office. Therefore, the data used in this study also only come from Busan district division. However, the findings of this study can be applied to other district division of KEPCO. It is because that this study focuses on the evaluation method.

Scope & limitation of the study

To prove that evaluation method suggested as adequate method, this study simulate the result of evaluation from 2009 to 2010 with the adjusted methods. It is better to simulate the result during much longer periods. However, there are some problems to gain the data. Particularly, we need more specific record of indicators, or sub-indicators to employ the grade method. With this reason, simulation of this study is limited to short period from 2009 to 2010. This study mentioned several ideas that we have to consider when it comes to use of grade evaluation system in the last part. However, this theme is needed more research to

totally understand about it. Therefore, more deep and specific study about this theme will be remained for the further research.

Ⅱ Literature review

1. Theoretical concepts

1.1 Performance Evaluation System of SOEs

State-Owned Enterprise – Justification and Limitation

According Chang(2007), there are various opinions whether SOE is needed or not. The most frequently mentioned justifications for SOE in economic text book are natural monopoly, capital market failure, externalities, and equity. First, in a natural monopoly(ex. technological requirement) the monopoly supplier can exploit profit at the expense of other suppliers. The monopolist also produces at less than socially optimal level, causing the economic inefficiency. Second, SOE is needed when private sector investors refuse to invest in long and high risk industries. Third case for SOEs is the problem of externalities. It means that SOEs distribute their productivity gains to the rest of the economy which do not paid for it. The final reason to set up SOEs is equity. Some profit driven private firms can refuse all people access to vital service such as electric, water, and post, while SOEs are guarantee universal access to it.

Despite these justifications for SOEs, he illustrates the case against SOEs, “the principal-agent problem, the free-rider problem, and the soft budget constraint”. For SOEs,

managers who run SOEs are different from owner. Principals can not perfectly monitor their agents, leading an inefficient management. Related with the numerous owners, SOEs also have “the free-rider problem” that the owners(citizens) have no incentive to monitor the managers of SOEs. The last limitation of SOEs is “the soft budget constraint”(Korai, 1986). SOEs can receive government financial support like government bail-out despite of their poor performance. These problems cause the mismanagement of SOE managers.

Solution to deal with problems of SOEs–Privatization and Alternatives to Privatization

To address problems of SOEs, there are two major solution, privatization and alternatives to privatization. Given a fact that discrepancy between ownership and control of SOEs cause the limitation of SOEs, privatization is a solution to marry ownership and control. Although privatization is a prominent method to address the problem of SOEs, it is available under some conditions. Therefore, Jones(1991) suggests an alternative solution, “a signaling system” that motivate and guide manager properly. This signaling system consists of three components such as a performance evaluation system, a performance information system, and an incentive system. First, a performance evaluation system translates national goals into explicit objectives and performance criterion. Second, a performance information system monitors actual performance of managers and workers. Third, the incentive system gives managers and workers pecuniary or non-pecuniary incentive based on their achievement.

Chang(2007) also suggests alternative solutions to privatization such as “organizational reforms, increasing competition, and political administrative reforms.” First, organizational reforms consist with several elements including clear goal, improving the quality of information and incentive system, and enhancing the ability of the monitoring agency, and reducing the number of SOEs. Second, boosting competition for SOEs can lead

the positive results. Competition comes from the private sector, even other SOEs. Last, political reform such as public works program and unemployment insurance can alleviate the big burden of SOEs. In addition, improvement of the quality of the economic bureaucracy can also solve the problem of SOEs by raising the pay, investment in training, and enhancing the public service ethic.

Performance evaluation system

To understand the performance evaluation of the public sector, we begin with the feature of the public sector related to the performance. It can explain whether the performance measure is available and is needed in public sector. On this issue, Dixit(2002) insist that the key features of public sector are multiple principals and multiple goals. They serve several masters including service user, politician, and payers as well as pursuit multiple goals such as efficiency and equity. These characters make the public sector hard to meet the expectation and to play to incentives as private sector does. According to Yair(1981), public sector work less competitively than private sector that is dependent on the market system.

This unique feature of public sector is the reason why it is needed the performance evaluation at the same time why it is difficult to evaluate the performance of public sector. Jones(1991) points out that it is difficult to specify the goal of the public sector due to the multiple objectives and plural principals. If the goal is not clear, it is also hard to distinguish good and bad performance, leading the inefficiency of the public sector. Alexander(1999) also argues that this makes the design of performance indicators difficult.

THIEL and LEEUW(2002) insist the problem of performance assessment in the public sector what they called ‘The performance paradox in the public sector’ and also suggest how to deal with that problem. According to Meyer and Gupta(1994), ‘the performance paradox’ means a weak relationship between performance indicators and

performance itself. In other words, performance indicators fail to measure actual performance. This phenomenon is caused by many factors. First, a discrepancy of objectives between politicians and executive agents increase this problem. Second, the other reason to increase the chance of 'the performance paradox is the lack of bankruptcy of organization in public sector. Finally, most public sector organizations are monopoly, which makes hard to evaluate the performance comparing with others. In order to detect and prevent 'the performance paradox', THIEL and LEEUW suggest a comparison of actual and reported performance. However, the lack of information to be used in comparison makes hard to do it. To deal with this problem, they find out three alternative methods. First is to use external information such as ombudsman and NGOs. Second is to generate the new performance indicators. The final method is to analyze the performance assessment system.

The special character of the public sector does not mean that performance evaluation is useless for it. In other words, performance evaluation is also used as a tool to boost competition and raise the efficiency in the public sector. Started in 1970, the trend to pursuit the small government demanded efficiency in public sector. Out of the prevailed thought that performance in public sector is difficult to measure, people tried to establish the reasonable evaluation system(Lee, Song, and Kim 2005). Kwak(2003) shows that evaluation system contribute to the improvement of SOEs based on the record for the past 20 years. Yoon and Kong(2008) analyze how the evaluation system affect to the budget reduction.

To play this role, performance evaluation should reflect the feature of public sector properly considering commercial and noncommercial objectives. In addition, the evaluation system should measure the performance exactly and reduce errors in the evaluation process. They study the improvement of the system and suggest the direction by analyzing the evaluation method, the process, the period, and so on(Kim, 2001; Song, 2003). In this trend,

some papers recently find out the error through the process of the evaluation. Choi(2009) search about the fault that the evaluator committed.

1.2 Relative vs. absolute evaluation method

Absolute evaluation is a method measuring how much the subject achieves the goal by standard, cut score, and criterion. Relative evaluation method is a way to provide the information about the relative place or order within a group by comparing with other subjects. While the quantitative indicator is adequately measured by absolute method, qualitative indicator is difficult. In this case, relative method is more proper than absolute method. The relative method can clearly show the difference of the performance between subjects. However, relative method use the forced distribution of subject, which sometimes cause the overheated competition and make subjects to focus on the order or final result, not the process.

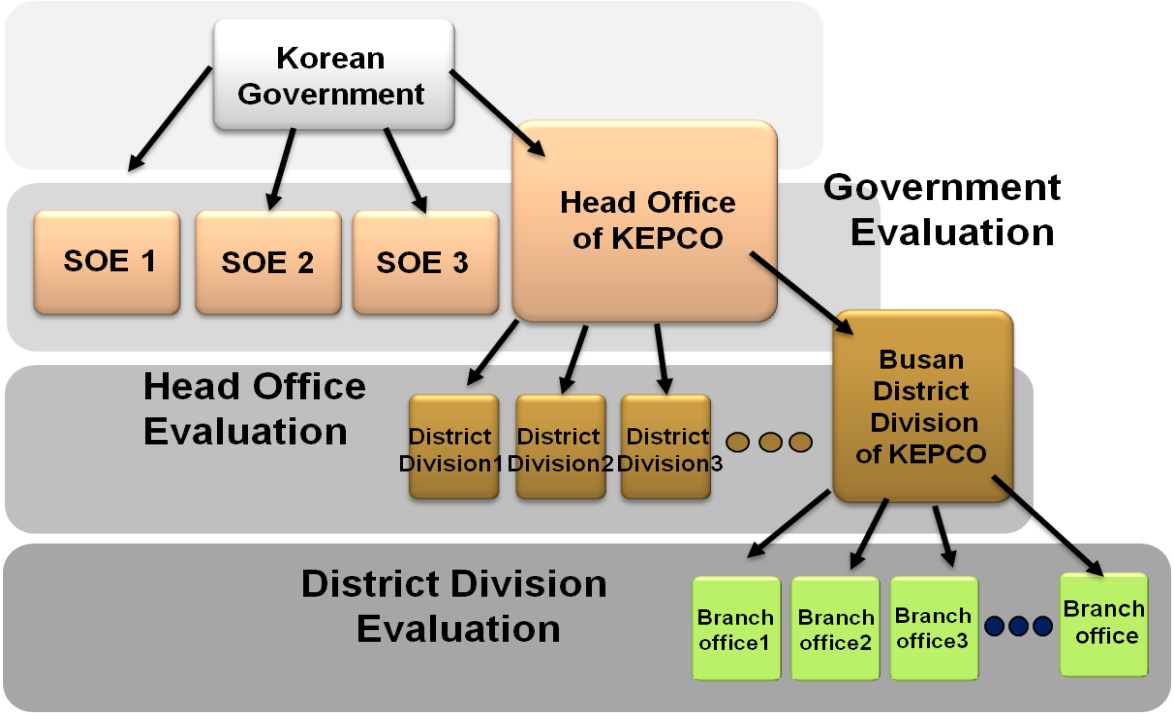
2. The performance evaluation system of KEPCO

The three levels of the evaluation

The performance evaluation system is divided into three levels, the government evaluation, the head office evaluation, the district division evaluation. The Korean government evaluates the management of state-owned company annually. The performance evaluation system is based on the law related in the management of SOEs. KEPCO has its own performance evaluation system. To achieve the management goal and assume the management responsibility, KEPCO appraise the executive officers, 13 district divisions, and

393 branch offices. The system of KEPCO is running on two levels, head office and district divisions. As the head office evaluation which evaluates district divisions including Busan district division, each district division evaluates its branch offices. The result of evaluation is used in incentive and promotion system each year.

< Figure 1: Three Levels of Evaluation >



The evaluation system of Busan district division of KEPCO

The subjects of the evaluation are 15 branch offices belonged to Busan district division. They are grouped into three units in accordance with the scale and job association. The large-scale branch offices in charge of the sales and distribution are included in the first group. The second group is for the small and medium-scale branch offices in the sales and distribution field. The last group is for three power transmission offices. The evaluation is implemented twice a year, tentative and final. The tentative evaluation is usually

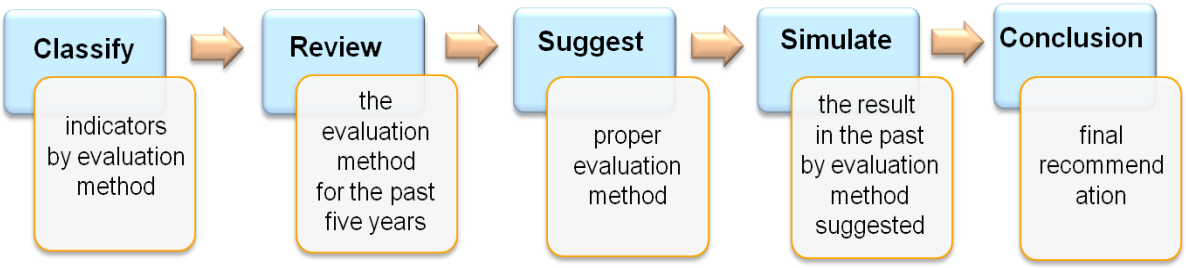
implemented on October and the final evaluation on the end of the year. Indicators are slightly different each year with an approximately 13 ~19 indicators in terms of customer, financial, internal business process, and learning and growth. The method is different depending on the feature of the indicators. The result of the evaluation is used to financial compensation and promotion.

Ⅲ Research Method & FINDINGS

1. Research design

This study reviews the performance evaluation system of BDD critically as follows. First, we classify the indicators by the evaluation method from 2006 to 2010. Second, this study examines the evaluation method used in PES over the past five years for reasonability in terms of measurability, distribution, and the balanced weight. Third, based on the result of review above, we suggest the improved use of the evaluation methods. Forth, in order to prove this suggestion, this study simulates the adjusted method with the result of evaluation in 2009 and 2010. Finally, with the result of simulation, we also recommend the some specific method related with the use of five grades method.

< Figure 2: Research design >



2. Data collection

To examine the reasonability of the evaluation system in terms of the evaluation methods, this study analyzes the result of the evaluation of BDD at KEPCO. The data comes from the PES manuals and the results of evaluation for the past five years from 2006 to 2010. The data includes the annual result of evaluation for 12 branch offices belonged to Busan district division. We examine and simulate the specific result of indicators including the goal and actual record of sub-indicator. To acquire the consistency of the result, the data is limited in the case of branch office, not transmission offices. Because three transmission offices belonged to BDD after 2009 by organizational restructure.

3. Data analysis

The classification of the indicators by the evaluation method

The indicators used in the evaluation system are divided into two, quantitative or qualitative, by its feature. While quantitative indicator is measured by numerical or quantitative method, qualitative indicator is hard to be measured by these methods. Indicators used in PES of BDD are almost are quantitative indicators. The indicator entitled ‘Management Responsibility’ is only one qualitative indicator in every year. This is an indicator examining of contribution of branch office to vision of district division. These indicators for the past five years are classified by evaluation method, absolute or relative methods like <Table 1>.

There is a similar pattern in which most indicators employ the absolute evaluation method. It is because that more than 95% of the indicators are quantitative. From 2006 to 2010, all quantitative indicators are used by absolute method, except of the case of 2009.

Three quantitative indicators in 2009 employ the relative method with the forced discrimination method. In 2010, most indicators employed five grades absolute evaluation method. Only one qualitative indicator ‘management responsibility’ is evaluated by five grades relative method. Based on findings above, we can figure out three distinctive features in these periods. From 2006 to 2008, most indicators employed absolute evaluation method. In 2009, three quantitative indicators are evaluated by relative method with the forced discrimination. Most indicators in 2010 are employed five grades absolute evaluation method. In common, only one qualitative indicator is evaluated by relative evaluation method. The evaluation system each year has some distinctive features depending on what evaluation method is used.

< Table 1: Classification of Indicators by the Evaluation Method>

		2006	2007	2008	2009	2010
number of indicator		19	17	18	13	13
absolute	quantitative	18	16	17	9	12
	qualitative	0	0	0	0	0
	total	18	16	17	9	12
	%	94.74	94.12	94.44	69.23	92.31
relative	quantitative	0	0	0	**3**	0
	qualitative	1	1	1	1	1
	total	1	1	1	4	1
	%	5.26	5.88	5.56	30.77	7.69

Review(examination of reasonability)

To review whether the evaluation methods are reasonably used in PES, this study analyzes the result of evaluation and examines the reasonability of the system in terms of measurability, distribution, and the balanced weight.

Measurability

Which method be used depends on the measurability of the indicator. Indicators are classified into two categories, quantitative and qualitative indicator. Qualitative indicator is hard to be measured by numerical or quantitative method. Take an example as the evaluation of beauty in the class. The sense of beauty is hard to be judged by one absolute criterion because people have the different standard about it. In this case, we can make the relative order of beauty in the class, which is a relative method. The relative method is more suitable for the qualitative indicators. All qualitative indicators are evaluated by relative method from 2006 to 2010. In this respects, the evaluation system of BDD is adequate for measurability.

Distribution

To inspect the reasonability of the evaluation system, distribution of score is also important factor. When scores of objects are close to each other, making the order is meaningless. For example, if the rates of collecting the bill are 98.111, 98.115, and 98.12, there is no big discrepancy. However, there might be an exception under special management situation. If the current management issue at given year is about profit and CEO emphasis the profit driven management, making the order is important. The PES has to be reflected that managerial feature.

In 2009, three quantitative indicators ‘collecting the bill, electric quality control, and utilizing facilities’, employed the relative method with the forced discrimination method. To examine whether this method is proper or not, we analyze the distribution of the result of these three indicators in 2009. Firstly, the indicator “collecting the bill” is evaluated by the rate of the goal achievement as you see <Table 2>, which is not vastly different among branch offices. This indicator is divided into three sub-indicators such as type1(customer in

use), type2(the high voltage customer who cancel the contract), and type3(the low voltage customer who cancel the contract). Each sub-indicator is evaluated by the achievement of goal. The goal is an increase of 20 percent compared with the previous year. It is impossible to achieve 100 percent of collecting the bill. Therefore, this indicator is examined by improvement of the performance. The indicator "Electric quality control" also has three sub-indicators. Although one sub-indicator "the number of blackout" has a discrepancy, others meet the goal more than 100% as <Table 3>. The goal is set by the weighted average like 2006(20%), 2007(30%), and 2008(50%). The indicator "Utilizing the facilities' has a similar goal achievement among branch offices as <Table 4>. For the goal of sub-indicator "Electric loss", the total goal of BDD is allocated to branch offices in proportion to the previous result of each branch office. All three indicators are set the goal considering the previous or past result. Therefore, these indicators focus on the improvement of performance. In terms of score, three indicators also have no big distribution from 2006 to 2008 as <Table 5> below shows.

< Table 2: Distribution of the Indicator 'Collecting the Bill' >[1]

	type1			type2			type3		
	goal	record	%	goal	record	%	goal	record	%
office1	98.662	98.701	100.04	48.253	39.173	81.183	46.519	55.111	118.470
office2	98.795	98.935	100.14	23.73	21.858	92.111	35.251	42.166	119.616
office3	98.473	98.502	100.03	22.471	30.383	135.210	40.051	47.178	117.795
office4	98.47	98.553	100.08	26.769	7.179	26.818	39.493	49.452	125.217
office5	99.47	99.513	100.04	22.47	8.849	39.381	39.44	47.476	120.375
office6	98.822	98.791	99.97	30.687	50.607	164.913	40.37	45.58	112.906
office7	98.669	98.446	99.77	26.186	26.58	101.505	38.034	50.115	131.764
office8	98.981	99.123	100.14	30.009	28.646	95.458	36.424	52.291	143.562
office9	99.365	99.43	100.07	21.637	10.757	49.716	42.854	61.381	143.233
office10	98.602	98.88	100.28	23.926	32.9	137.507	40.497	57.179	141.193
office11	98.755	98.71	99.95	35.126	42.443	120.831	44.033	63.486	144.178
office12	98.798	99.073	100.28	23.778	15.858	66.692	34.124	49.501	145.062

[1] Most branch offices are achieved their goal. In this respect, the distribution is small.

< Table 3: Distribution of the Indicator “Electric Quality Control”>

	the number of blackout			the time of blackout(type1)			the time of blackout(type2)		
	goal	record	%	goal	record	%	goal	record	%
office1	3.78	4	94	10.1	8.25	118	70.25	29.75	158
office2	6.25	6	104	11.61	11.59	100	53.68	47.5	112
office3	8.54	8	106	9.41	9.38	100	40.86	40.63	101
office4	10.49	13	76	10.41	10.41	100	44.97	37.22	117
office5	15.08	13	114	11.46	11.46	100	45.47	22.48	151
office6	8.79	11	75	9.03	8.98	101	34.94	33.62	104
office7	14.95	13	113	13.37	13.36	100	49.36	46.34	106
office8	9	16	22	13.99	13.99	100	40.76	28.85	129
office9	4.83	5	96	13.811	13.74	101	33.23	27.11	118
office10	1.87	4	-14	11.26	11.26	100	67.69	37.58	144
office11	4.38	5	86	17.27	17.26	100	33.5	28.32	115
office12	3.04	4	68	15.67	15.67	100	51.77	35.75	131

< Table 4: Distribution of the Indicator “Utilizing facilities”>

	power line			electric loss		
	Number of line	irregular	%	goal	record	%
office1	59	0	100	4.250	4.303	99.00
office2	95	0	100	1.921	2.203	85.00
office3	79	0	100	3.515	3.032	114.00
office4	132	0	100	2.842	2.680	106.00
office5	118	0	100	2.696	2.880	93.00
office6	93	0	100	1.369	1.503	90.00
office7	61	0	100	3.246	3.221	101.00
office8	64	0	100	2.997	3.043	98.00
office9	36	0	100	3.104	3.121	99.00
office10	12	0	100	3.350	3.475	96.00
office11	19	0	100	5.764	6.277	91.00
office12	19	0	100	4.782	3.465	128.00

\

< Table 5: Score Gap of Three Indicators >

Indicator	2006		2007		2008	
	Group1	Group2	Group1	Group2	Group1	Group2
collecting the bill	0	0.11	0	0	0	0
Electric quality control	0.04	0.07	0.05	0.04	0.08	0.04
Utilizing facilities	0	0	0	0	0	0

The balanced weight

It is inevitable that some indicators have the relatively bigger influence to final result than others. However, a few indicators with dominant power to determine the final result might impact on the reasonability of the evaluation system. In this respects, this study examine the dominant power of indicators. In order to find out the dominant power of indicator, the gap between the highest score and the lowest score of each indicator is calculated firstly. And then, these numbers are compared with the gap between the highest and the lowest in total score.

$$\text{The dominant power}(\%) = \frac{\text{Max-Min(each indicator)}}{\text{Max-Min(total score)}} \times 100$$

With this method, we can find a fact that indicators with relative evaluation method, both quantitative and qualitative, have a dominant power of final result. First, during the period from 2006 to 2008 employed absolute method, a few indicators have dominant power to final result. However, the power is not strong as much as indicators used the relative method in other period. In 2006, this feature can be observed in indicator “Control the Demand and Peak” in Group1 with 46.88% of dominant power and indicator “Ethical Management” in Group2 with the 55.26% as you see <Table 6>. Indicator “EVA” in Group2

in 2007 shows the huge dominant power(65.85%) in <Table 7>. In 2008, the indicator "Integrity" has big influence of 54.25% as the following <Table 8> shows. Although these indicators have relatively strong dominant power, there is no correlation between the dominant power and evaluation method. However, we figure out the dominant power of some indicators that is caused by evaluation method in 2009 and 2010.

< Table 6: The Balanced Weight in 2006 >

INDICATOR		GROUP1						GROUP 2					GROUP 1	GROUP 2
		Office 1	Office 2	Office 3	Office 4	Office 5	Office 6	Office 1	Office 2	Office 3	Office 4	Office 5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	1	2	3	4	5		
Total Score		96.900	96.710	96.640	96.350	96.310	96.260	96.910	96.630	96.360	96.160	96.150	0.64	0.76
The gap with former rank			0.190	0.070	0.290	0.040	0.050		0.280	0.270	0.200	0.010		
The gap with first rank		0.000	0.190	0.260	0.550	0.590	0.640	0.000	0.280	0.550	0.750	0.760		
Customer Service Satisfaction (type1)	Score	6.400	6.310	6.410	6.280	6.200	6.250	6.400	6.340	6.230	6.440	6.250	0.21	0.21
	Rank	2	3	1	4	6	5	2	3	5	1	4	32.81%	27.63%
Collecting the bill	Score	9.000	9.000	9.000	9.000	9.000	9.000	8.980	9.000	9.000	8.890	8.930	0	0.11
	Rank	1	1	1	1	1	1	3	1	1	5	4	0.00%	14.47%
Customer Service Satisfaction (type2)	Score	4.340	4.290	4.270	4.280	4.190	4.240	4.380	4.230	4.270	4.360	4.330	0.15	0.15
	Rank	1	2	4	3	6	5	1	5	4	2	3	23.44%	19.74%
Control the Demand and Peak	Score	10.000	10.000	9.930	9.940	9.960	9.700	10.000	10.000	9.940	9.760	9.700	0.3	0.3
	Rank	1	1	5	4	3	6	1	1	3	4	5	46.88%	39.47%
Electric Quality Control	Score	9.570	9.590	9.590	9.550	9.550	9.550	9.550	9.520	9.490	9.560	9.520	0.04	0.07
	Rank	3	1	1	4	4	4	2	3	5	1	3	6.25%	9.21%
Ethical Management	Score	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.580	3.000	0	0.42
	Rank	1	1	1	1	1	1	1	1	1	4	1	0.00%	55.26%
PR for Electric Industry	Score	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.910	0	0
	Rank	1	1	1	1	1	1	1	1	1	1	5	0.00%	0.00%
EVA	Score	7.000	7.000	7.000	6.880	6.880	7.000	7.000	7.000	7.000	7.000	7.000	0.12	0
	Rank	1	1	1	5	5	1	1	1	1	1	1	18.75%	0.00%
Innovation activities	Score	4.820	4.800	4.830	4.830	4.820	4.790	4.790	4.800	4.830	4.800	4.800	0.04	0.04
	Rank	3	5	1	1	3	6	5	2	1	2	2	6.25%	5.26%
Integrity	Score	6.000	6.000	5.980	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	0.02	0
	Rank	1	1	6	1	1	1	1	1	1	1	1	3.12%	0.00%
Prevention of Negligent Accident	Score	4.770	4.760	4.780	4.700	4.780	4.800	4.810	4.780	4.730	4.840	4.820	0.1	0.11
	Rank	4	5	2	6	2	1	3	4	5	1	2	15.62%	14.47%
Management Responsibility	Score	5.000	4.960	4.850	4.890	4.930	4.930	5.000	4.960	4.870	4.930	4.890	0.15	0.13
	Rank	1	2	6	5	3	3	1	2	5	3	4	23.44%	17.11%

< Table 7: The Balanced Weight in 2007 >

INDICATOR		GROUP1						GROUP 2					GROUP 1	GROUP 2
		Office 1	Office 2	Office 3	Office 4	Office 5	Office 6	Office 1	Office 2	Office 3	Office 4	Office 5	MAX-MIN	MAX-MIN
Rank		1	2	3	3	5	6	1	2	3	4	5		
Total Score		97.070	96.960	96.910	96.910	96.900	96.770	97.090	96.970	96.860	96.760	96.680	0.3	0.41
The gap with former rank			0.110	0.050	0.050	0.010	0.130		0.120	0.110	0.100	0.080		
The gap with first rank			0.110	0.160	0.160	0.170	0.300		0.120	0.230	0.330	0.410		
EVA	Score	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	8.730	9.000	0	0.27
	Rank	1	1	1	1	1	1	1	1	1	5	1	0	**65.85%**
Customer Service Satisfaction (type1)	Score	5.740	5.700	5.700	5.700	5.690	5.670	5.670	5.680	5.660	5.680	5.610	0.07	0.07
	Rank	1	3	3	3	5	6	3	1	4	1	5	23.33%	17.07%
Customer Service Satisfaction (type2)	Score	4.620	4.580	4.590	4.590	4.560	4.540	4.610	4.630	4.600	4.660	4.580	0.08	0.08
	Rank	1	4	2	2	5	6	3	2	4	1	5	26.67%	19.51%
Electiric Quality Control	Score	9.750	9.740	9.760	9.760	9.740	9.710	9.750	9.740	9.760	9.760	9.720	0.05	0.04
	Rank	2	4	1	1	4	6	3	4	1	1	5	16.67%	9.76%
Integrity	Score	5.800	5.830	5.850	5.850	5.810	5.810	5.910	5.880	5.810	5.770	5.860	0.05	0.14
	Rank	6	2	1	1	3	3	1	2	4	5	3	16.67%	34.15%
Prevention of Negligent Accident	Score	4.000	4.000	3.990	3.990	4.000	3.990	4.000	4.000	4.000	4.000	4.000	0.01	0
	Rank	1	1	5	5	1	5	1	1	1	1	1	3.33%	0.00%
Innovation Activities	Score	7.870	7.800	7.820	7.820	7.850	7.800	7.830	7.800	7.800	7.830	7.760	0.07	0.07
	Rank	1	4	3	3	2	4	1	3	3	1	5	23.33%	17.07%
Management Responsibility	Score	9.940	9.940	9.850	9.850	9.900	9.900	9.970	9.890	9.880	9.980	9.800	0.09	0.18
	Rank	1	1	6	6	3	3	2	3	4	1	5	30.00%	43.90%
general management	Score	1.850	1.870	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850	1.850	0.02	0
	Rank	2	1	2	2	2	2	1	1	1	1	1	6.67%	0.00%

<Table 8: The Balanced weight in 2008 >

INDICATOR		GROUP 1							GROUP 2					GROUP 1	GROUP 2
		Office 1	Office 2	Office 3	Office 4	Office 5	Office 6	Office 7	Office 1	Office 2	Office 3	Office 4	Office 5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	7	1	2	3	4	5		
Total Score		95.562	95.455	95.410	95.384	95.330	95.179	95.009	95.628	95.588	95.374	95.311	95.229	0.553	0.399
The gap with former rank			0.107	0.045	0.026	0.054	0.151	0.169		0.040	0.214	0.063	0.082		
The gap with first rank			0.107	0.152	0.178	0.232	0.383	0.553		0.040	0.254	0.317	0.399		
Customer Service Satisfaction (type1)	Score	7.970	7.990	7.950	7.970	7.920	7.900	7.920	7.990	8.000	7.930	7.920	7.940	0.09	0.08
	Rank	2	1	4	2	5	7	5	2	1	4	5	3	16.27%	20.05%
Customer Service Satisfaction (type2)	Score	4.930	4.900	4.900	4.900	4.880	4.850	4.880	4.950	4.950	4.800	4.880	4.850	0.08	0.15
	Rank	1	2	2	2	5	7	5	1	1	5	3	4	14.47%	37.59%
Electric Quality Control	Score	9.920	9.860	9.880	9.880	9.860	9.840	9.880	9.900	9.880	9.880	9.860	9.860	0.08	0.04
	Rank	1	5	2	2	5	7	2	1	2	2	4	4	14.47%	10.03%
Integrity	Score	9.760	9.760	9.650	9.700	9.730	9.690	9.460	9.790	9.800	9.840	9.770	9.730	0.3	0.11
	Rank	1	1	6	4	3	5	7	3	2	1	4	5	**54.25%**	27.57%
Prevention of Negligent Accident	Score	2.993	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.994	3.000	0.0075	0.00618
	Rank	7	1	1	1	1	1	1	1	1	1	5	1	0	1.55%
Propriety of the Facility investment	Score	4.997	5.000	5.000	4.999	4.995	4.996	4.999	4.998	4.995	4.999	5.000	4.999	0.005	0.005
	Rank	5	1	1	3	7	6	3	4	5	2	1	2	0.90%	1.25%
Innovation Activities	Score	5.020	5.015	5.020	5.000	5.020	5.000	5.020	5.000	5.000	5.000	5.000	5.000	0.02	0
	Rank	1	5	1	6	1	6	1	1	1	1	1	1	3.62%	0
general management	Score	0.010	0.005	0.010	0.010	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0
	Rank	2	5	2	2	6	1	6	1	1	1	1	1	2.71%	0
Management Responsibility	Score	4.963	4.925	5.000	4.925	4.925	4.888	4.850	5.000	4.963	4.925	4.888	4.850	0.15	0.15
	Rank	2	3	1	3	3	6	7	1	2	3	4	5	27.12%	37.59%

In 2009, three quantitative indicators with relative method have a dominant power to the final result as follows. The indicator “Management responsibility” shows 103.09% of dominant power in Group1 and 78.74% in Group2. The indicator “Collecting the bill” also has 81.86% of dominant power in Group1 and 52.91 in Group2. We can also find that the indicator “Electric Quality Control” has 103.09% of dominant power in Group1 and 78.74% in Group2. Lastly, the indicator “Utilizing facilities” has dominant power such as 41.23% in Group1 and 31.5% in Group2 as <Table9> shows. Moreover, the indicators “Management Responsibility” and “Electric Quality Control” even have the higher gap than the gap of total score(0.485 in group1, 0.635 in group 2). These are all employ relative evaluation method in common.

<Table 9: The Balanced Weight in 2009 >

INDICATOR		GROUP 1							GROUP 2					GROUP 1	GROUP 2
		Office 1	Office 2	Office 3	Office 4	Office 5	Office 6	Office 7	Office 1	Office 2	Office 3	Office 4	Office 5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	7	1	2	3	4	5		
Total Score		99.045	99.028	98.871	98.861	98.719	98.610	98.560	99.129	99.120	98.948	98.588	98.494	0.485	0.635
The gap with former rank			0.017	0.157	0.010	0.142	0.109	0.050		0.009	0.172	0.360	0.094		
The gap with first rank			0.017	0.174	0.184	0.326	0.435	0.485		0.009	0.181	0.541	0.635		
Management Responsibility	Score	9.500	10.000	9.750	9.625	9.750	9.875	9.750	10.000	9.750	9.500	9.625	9.875	0.5	0.5
	Rank	7	1	3	6	3	2	3	1	3	5	4	2	103.09(%)	78.74(%)
TDR and 6σ activities	Score	9.835	9.846	9.850	9.843	9.843	9.839	9.839	9.843	9.835	9.835	9.836	9.836	0.015	0.008
	Rank	7	2	1	3	3	5	5	1	4	4	2	2	3.09(%)	1.26(%)
Customer Service Satisifaction	Score	4.984	4.968	4.984	4.976	4.984	5.000	4.992	4.968	4.976	4.984	5.000	4.992	0.032	0.032
	Rank	3	7	3	6	3	1	2	5	4	3	1	2	6.60(%)	5.04(%)
EVA	Score	23.971	23.971	23.971	23.971	23.971	23.980	23.971	23.971	23.971	23.980	23.971	23.971	0.009	0.009
	Rank	2	2	2	2	2	1	2	2	2	1	2	2	1.86(%)	1.42(%)
Collecting the Bill	Score	14.868	14.546	14.471	14.576	14.496	14.498	14.577	14.514	14.836	14.798	14.686	14.500	0.397	0.336
	Rank	1	4	7	3	6	5	2	4	1	2	3	5	81.86(%)	52.91(%)
Electric Quality Control	Score	13.992	13.897	14.000	13.870	13.794	13.591	13.500	14.000	13.952	13.851	13.641	13.500	0.5	0.5
	Rank	2	3	1	4	5	6	7	1	2	3	4	5	103.09(%)	78.74(%)
Utilizing Facilities	Score	9.895	9.800	9.845	10.000	9.881	9.827	9.931	9.833	9.800	10.000	9.829	9.820	0.2	0.2
	Rank	3	7	5	1	4	6	2	2	5	1	3	4	41.24(%)	31.50(%)

The evaluation system in 2010 employed the five grades absolute method to all indicators, except of one qualitative indicator “Management Responsibility”. As a result, seven indicators of the thirteen indicators have no discrepancy in score. It is because that the aim of grade method is to reduce the dominant power of some indicators to final result. As see in <Table 10>, the indicator ‘Management Responsibility has the biggest gap between the highest and the lowest in score. This indicator has 1.36 score gap(47.55%) in group1 and 1.593 score gap(56.93%) in group2. While other indicators employed the 5 grades absolute method in which the gap is small, only one indicator with relative method is necessary to have the dominant power.

<Table 10: The Balanced Weight in 2010 >

Indicator		GROUP 1							GROUP 2					GROUP 1	GROUP 2
		OFFICE 1	OFFICE 2	OFFICE 3	OFFICE 4	OFFICE 5	OFFICE 6	OFFICE 7	OFFICE 1	OFFICE 2	OFFICE 3	OFFICE 4	OFFICE 5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	7	1	2	3	4	5		
Total Score		93.650	93.037	92.568	92.420	92.395	92.202	90.790	93.143	92.690	92.645	92.375	90.345	2.860	2.798
The gap with former rank			0.613	0.469	0.148	0.025	0.193	1.412		0.453	0.045	0.270	2.030		
The gap with first rank			0.613	1.082	1.230	1.255	1.448	2.860		0.453	0.498	0.768	2.798		
Electric Quality Control	score	15.000	15.000	15.000	14.800	15.000	14.850	14.200	15.000	15.000	15.000	15.000	14.200	0.8	0.8
	rank	1.000	1	1	6	1	5	7	1	1	1	1	5	27.97(%)	28.59(%)
TDR and 6σ activities	score	8.470	8.255	8.358	8.250	8.240	8.250	8.295	8.250	8.100	8.205	8.115	8.120	0.23	0.15
	rank	1.000	4	2	5	7	5	3	1	5	2	4	3	8.04(%)	5.36(%)
Management Responsibility	score	7.580	7.207	6.760	6.795	6.555	6.702	6.220	7.493	6.990	6.990	6.660	5.900	**1.36**	**1.593**
	rank	1.000	2	4	3	6	5	7	1	2	2	4	5	**47.55(%)**	**56.93(%)**
IT utilization in Sales activity	score	3.000	2.975	3.000	2.975	3.000	2.950	2.975	2.950	3.000	3.000	3.000	2.975	0.05	0.05
	rank	1.000	4	1	4	1	7	4	5	1	1	1	4	1.75(%)	1.79(5)
Integrity	score	3.000	3.000	3.000	3.000	3.000	2.850	3.000	2.850	3.000	2.850	3.000	3.000	0.15	0.15
	rank	1.000	1	1	1	1	7	1	4	1	4	1	1	5.24(%)	5.36(%)

The simulation by the adjusted method

For the reasonability of PES, suitable evaluation methods should be used in terms of measurability, distribution, and the balanced weight. Based on the result of the previous analysis, this study suggests adequate evaluation methods. All quantitative indicators should employ the five grades absolute method. For the qualitative indicator, the relative method

should be used with the small gap between each grade. This method can control the dominant power of one qualitative indicator with relative method by reducing the gap of each grade.

In order to prove this suggestion, this study simulates the adjusted method with the result of evaluation in 2009 and 2010. This simulation shows two types of the results, actual score gap and a rate of score gap. First, we can confirm that the dominant power of three indicators, collecting the bill, electric quality control, and utilizing facilities, is decreased by employing the five grades absolute method in 2009.

In simulation with the group 1 in <Table 11>, the score gap of the indicator 'collecting the bill' change from 0.397 to 0.875. In the indicator 'Electric Quality Control', the score gap also increases from 0.5 to 0.9. The score gap of the indicator 'Utilizing Facilities' rise from 0.2 to 0.8. Although the numerical difference increases, three indicators have generally a similar gap. These indicators have the similar influence on final result, without the dominant power of the particular indicator. The indicators 'TDR & 6 sigma activities and EVA' have the small score gap. It is because that these indicators are given a basic credit to all branch offices in common.

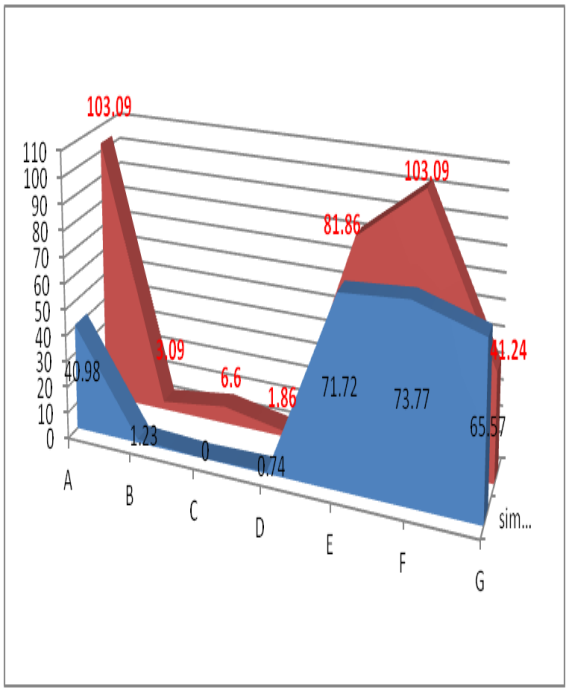
< Table 11: Simulation – Dominant Power of Indicators in 2009 >

Indicator		GROUP 1							GROUP 2					GROUP 1	GROUP 2
		Office1	Office2	Office3	Office4	Office5	Office6	Office7	Office1	Office2	Office3	Office4	Office5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	7	1	2	3	4	5		
Total Score		97.939	97.542	97.289	97.246	97.106	97.085	96.719	98.139	97.665	97.632	97.257	97.106	1.220	1.033
The gap with former rank			0.397	0.253	0.043	0.140	0.021	0.366		0.474	0.033	0.375	0.151		
The gap with first rank			0.397	0.650	0.693	0.833	0.854	1.220		0.474	0.507	0.882	1.033		
Management Responsibility	Score	9.625	10.000	9.750	9.750	9.500	9.750	9.875	10.000	9.500	9.875	9.750	9.625	0.5	0.5
	Rank	6	1	3	3	7	3	2	1	5	2	3	4	40.98(%)	48.40(%)
TDR and 6σ activities	Score	9.843	9.846	9.843	9.850	9.835	9.839	9.839	9.843	9.835	9.836	9.835	9.836	0.015	0.008
	Rank	3	2	3	1	7	5	5	1	4	2	4	2	1.23(%)	0.77(%)
Customer Service Satisfaction	Score	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	5.000	4.500	4.800	4.800	0	0.5
	Rank	1	1	1	1	1	1	1	2	1	5	2	2	0	48.40(%)
EVA	Score	23.971	23.971	23.971	23.971	23.971	23.971	23.980	23.971	23.980	23.971	23.971	23.971	0.009	0.009
	Rank	2	2	2	2	2	2	1	2	1	2	2	2	0.74(%)	0.87(%)
Collecting the Bill	Score	14.625	14.375	14.125	14.125	13.750	14.577	14.250	14.125	14.500	15.000	14.250	14.375	0.875	0.875
	Rank	1	3	5	5	7	2	4	5	2	1	4	3	71.72(%)	84.70(%)
Electiric Quality Control	Score	13.450	13.350	13.250	13.600	13.450	12.850	12.700	13.600	12.850	12.850	13.100	12.850	0.9	0.75
	Rank	2	4	5	1	2	6	7	1	3	3	2	3	73.77(%)	72.60(%)
Utilizing Facilities	Score	10.000	9.200	9.800	9.400	9.800	10.000	9.400	9.800	10.000	9.600	9.400	9.800	0.8	0.6
	Rank	1	7	3	5	3	1	5	2	1	4	5	2	65.57(%)	58.08(%)

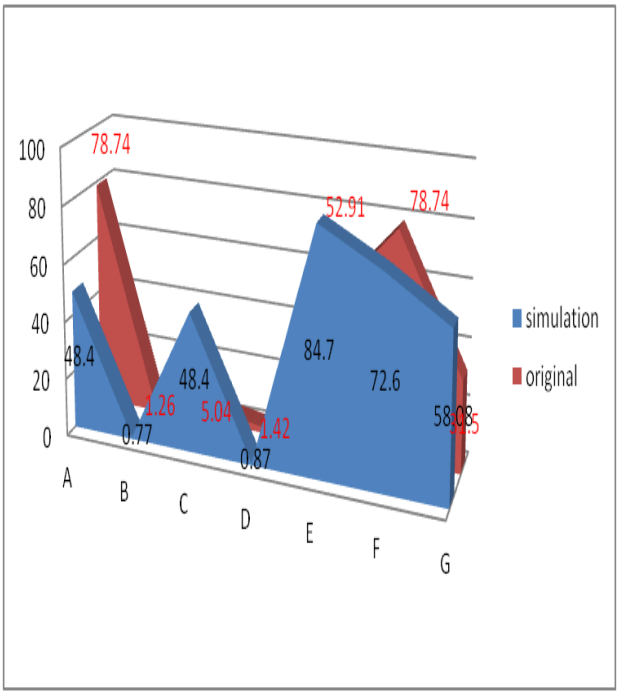
This tendency is also founded in the simulation to compare the gap of the indicator with the gap of the total score. In <Figure 3>, the indicator A has the reduced dominant power to the final result from 103.09% to 40.98%. The dominant power of indicators E, F, and G also decrease from 81.86%, 103.09%, 41.24% to 71.72%, 73.77%, 65.57%, respectively. Therefore, the influence of each indicator to the final result became similar.

< Figure 3: Simulation - Change of the Dominant Power in 2009 >

Indicator	group1		group2	
	simulation	original	simulation	original
Management Responsibility(A)	40.98	103.09	48.4	78.74
TDR & 6σ Activities (B)	1.23	3.09	0.77	1.26
Customer Service Satisfaction ©	0	6.6	48.4	5.04
EVA(D)	0.74	1.86	0.87	1.42
Collecting the bill (E)	71.72	81.86	84.7	52.91
Electric Quality Control (F)	73.77	103.09	72.6	78.74
Utilizing Facilities (G)	65.57	41.24	58.08	31.5



< Group 1 in 2009 >



< Group 2 in 2009 >

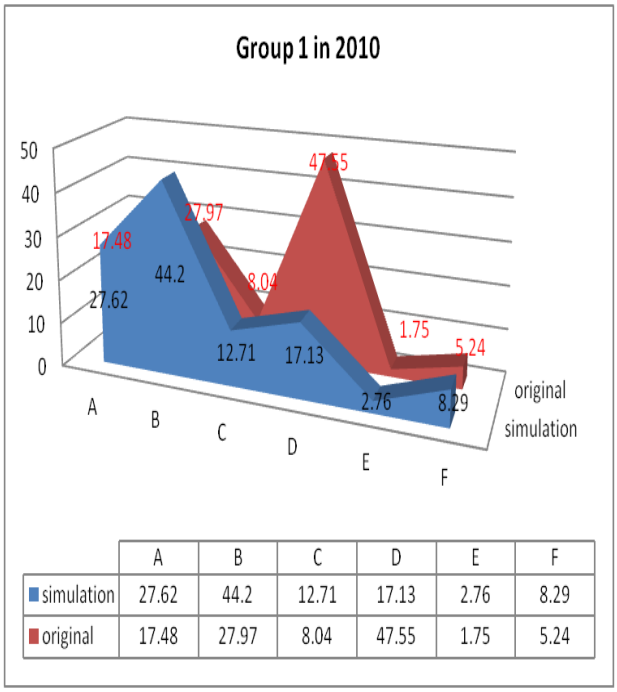
Another simulation shows the result to control the dominant power by modifying the grade gap of the indicators evaluated by the relative method in 2010 as you see in <Table 12>. After reducing the gap of each grade of indicator "Management responsibility" by 2.125%, the dominant power of the indicator is decreased. With the new five grades relative method, the score gap of the indicator 'Management Responsibility' is reduced from 1.36 to 0.555 in Group1 and from1.593 to 0.875 in Group 2. In the simulation with the rate, data shows the same result. The share of the gap between the highest and the lowest also decrease from 47.55% to 27.01% in group 1 and from 56.93% to 42.05% in group 2.

< Table 12: Simulation - Dominant Power of the Indicators in 2010 >

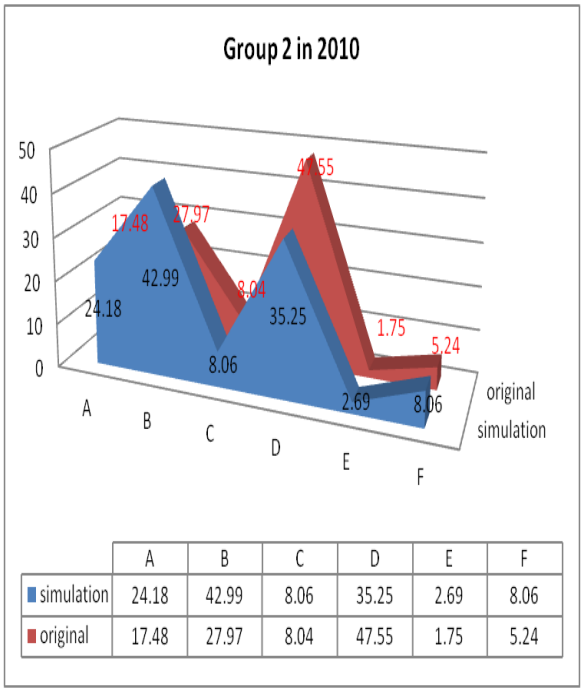
Indicator		GROUP 1							GROUP 2					GROUP 1	GROUP 2
		OFFICE 1	OFFICE 2	OFFICE 3	OFFICE 4	OFFICE 5	OFFICE 6	OFFICE 7	OFFICE 1	OFFICE 2	OFFICE 3	OFFICE 4	OFFICE 5	MAX-MIN	MAX-MIN
Rank		1	2	3	4	5	6	7	1	2	3	4	5		
Total Score		93.650	93.238	92.971	92.913	92.823	92.690	91.595	93.229	93.035	92.933	92.864	91.150	2.055	2.079
The gap with former rank			0.412	0.267	0.058	0.090	0.132	1.095		0.194	0.103	0.069	1.714		
The gap with first rank			0.412	0.679	0.737	0.827	0.960	2.055		0.194	0.297	0.366	2.079		
Collecting the bill	score	12.000	12.000	11.850	12.000	12.000	12.000	11.500	12.000	12.000	12.000	12.000	11.550	0.5	0.45
	rank	1	1	6	1	1	1	7	1	1	1	1	5	24.33%	21.64%
Electric Quality Control	score	15.000	15.000	15.000	15.000	14.800	14.850	14.200	15.000	15.000	15.000	15.000	14.200	0.8	0.8
	rank	1	1	1	1	6	5	7	1	1	1	1	5	38.93%	38.48%
TDR and 6σ activities	score	8.470	8.255	8.358	8.240	8.250	8.250	8.295	8.250	8.100	8.205	8.115	8.120	0.23	0.15
	rank	1	4	2	7	5	5	3	1	5	2	4	3	11.19%	7.21%
Management Responsibility	score	7.580	7.408	7.163	7.073	7.198	7.190	7.025	7.579	7.335	7.278	7.149	6.705	0.555	0.87425
	rank	1	2	5	6	3	4	7	1	2	3	4	5	27.01%	42.05%
IT utilization in Sales activity	score	3.000	2.975	3.000	3.000	2.975	2.950	2.975	2.950	3.000	3.000	3.000	2.975	0.05	0.05
	rank	1	4	1	1	4	7	4	5	1	1	1	4	2.43%	2.40%
Integrity	score	3.000	3.000	3.000	3.000	3.000	2.850	3.000	2.850	3.000	2.850	3.000	3.000	0.15	0.15
	rank	1	1	1	1	1	7	1	4	1	4	1	1	7.30%	7.21%

< Figure 4: Simulation - Change of the Dominant Power in 2010 >

Indicator	original		simulation		original		simulation	
	group1	group2	group1	group2	group1	group2	group1	group2
Collecting the bill(A)	17.48	16.08	27.62	24.18	0.5	0.45	0.5	0.45
Electric Quality Control(B)	27.97	28.59	44.2	42.99	0.8	0.8	0.8	0.8
TDR and 6σ activites(C)	8.04	5.36	12.71	8.06	0.23	0.15	0.23	0.15
Management Resposibility(D)	47.55	56.93	17.13	35.25	1.36	1.593	0.31	0.875
IT utilization in Sales activity(E)	1.75	1.79	2.76	2.69	0.05	0.05	0.05	0.05
Integrity(F)	5.24	5.36	8.29	8.06	0.15	0.15	0.15	0.15



	A	B	C	D	E	F
simulation	27.62	44.2	12.71	17.13	2.76	8.29
original	17.48	27.97	8.04	47.55	1.75	5.24



	A	B	C	D	E	F
simulation	24.18	42.99	8.06	35.25	2.69	8.06
original	17.48	27.97	8.04	47.55	1.75	5.24

How do we find out the adequate gap of the grade that controls the dominant power of the indicator? This study shows one of the methods to decide the grade gap with the example of indicator “Management responsibility’ in 2010 as stated above.

In 2010, the indicator ‘Management responsibility’ has a huge dominant power to the final result. Each grade has a five percent gap. This is five grades relative method, with the 20% gap between the highest grade and the lowest<Table 13>.

< Table 13: Five Grades Method in 2010 >

	Before					After				
Grade	S	A	B	C	D	S	A	B	C	D
%	100	95	90	85	80	100	97.875	95.75	93.625	91.5
Gap	5%					2.125%				

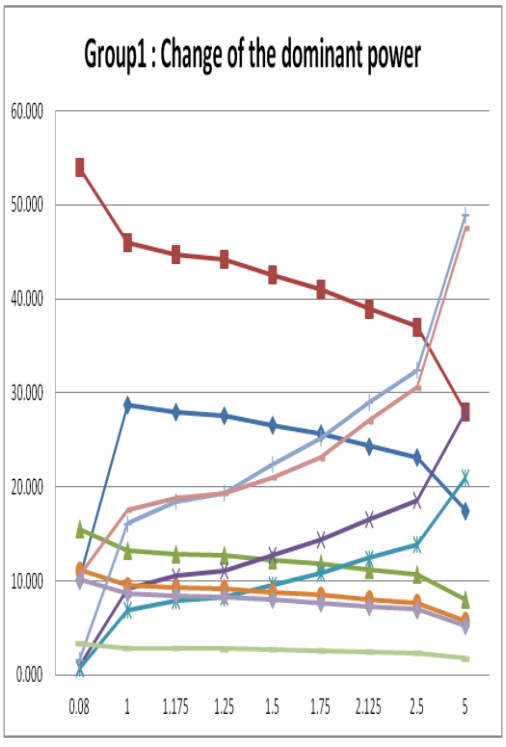
Unlike the absolute method, the relative method is necessary to have the discrepancy among the subjects. In order to figure out the proper gap of each grade that can control the dominant power of the indicator, this study estimates the dominant power by using several different gap of the grade as follows.

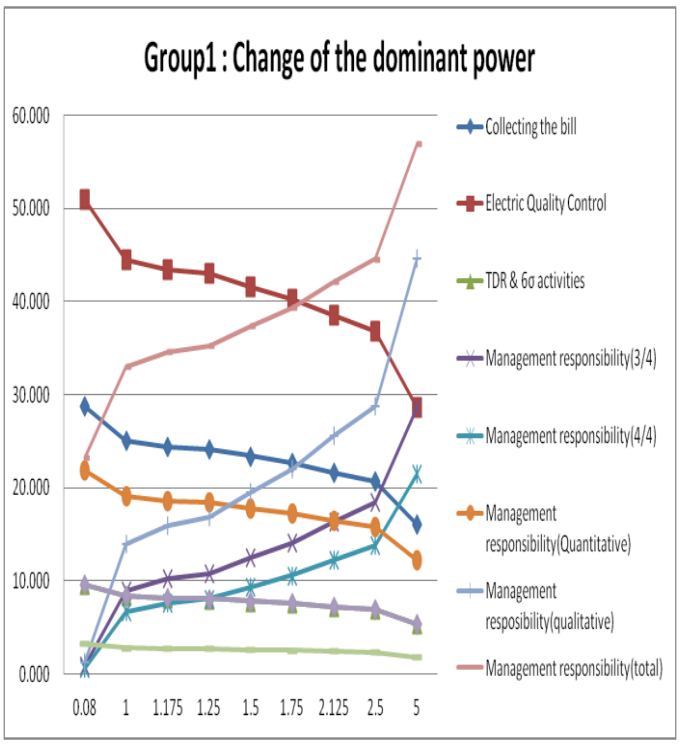
As the gap of grade of the indicator ‘Management responsibility’ is increasing, the dominant power to final result of other indicators is decreasing. In group 1, a grade gap at which indicators have a similar influence on the final result is about 2.5. In group 2, the grade gap is a roughly 1.75. Therefore, the grade gap that makes the dominant power of the indicator ‘Management Responsibility’ the lowest for both group1 and group 2 is 2.125.

Depending on the gap of grade, the dominant power of indicators has been changed as you see in table and figure below. The indicator “Electric Quality Control” has the biggest dominant power. As the gap of grade of Management Responsibility is increasing, the dominant power of “Electric Quality Control” goes down and dominant power of “Management responsibility” goes up. In Group1, the dominant power of indicators became similar at about 2.5%. Group2 has similar dominant power of indicators at about 1.75. Therefore, both groups can control the dominant power of indicators at 2.125% in common. When we examine the change of the dominant power with the actual score of indicators itself, it also shows the same result.

<Figure 5: Simulation - Change of the Dominant Power 'Management Responsibility' (%) >

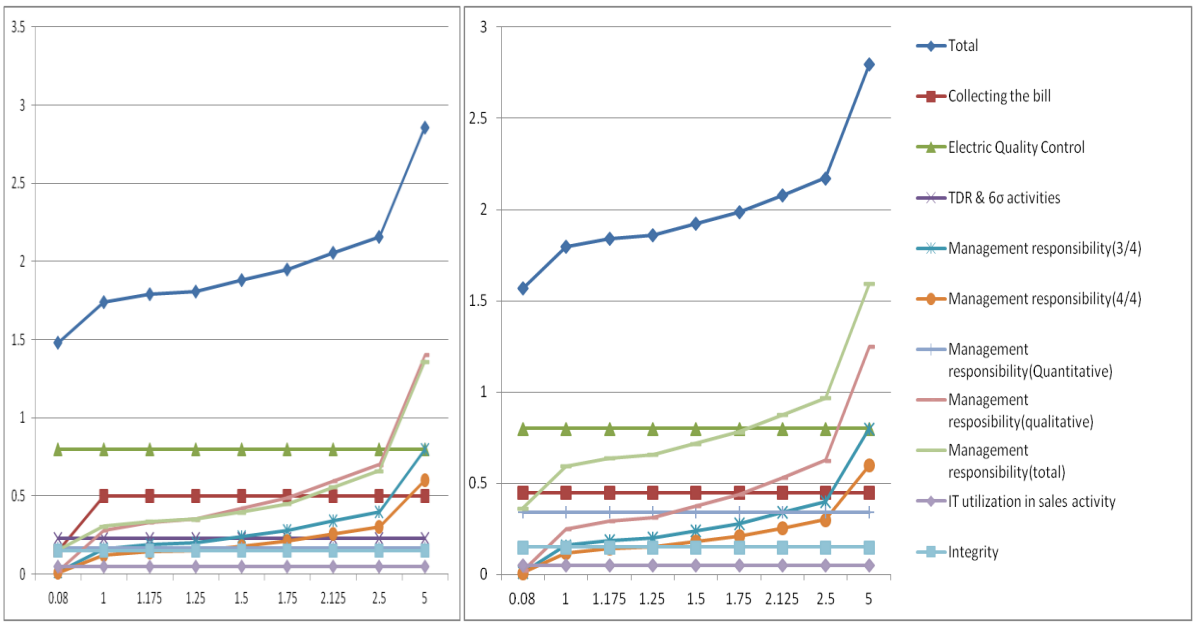
the scale of the grade	0.08		1		1.175		1.25		1.5		1.75		2.125		2.5		5	
Indicator	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2
Collecting the bill	10.119	28.699	28.736	25.028	27.949	24.433	27.624	24.187	26.596	23.401	25.641	22.664	24.331	21.642	23.148	20.709	17.483	16.083
Electric Quality Control	53.967	51.020	45.977	44.494	44.718	43.437	44.199	42.999	42.553	41.602	41.026	40.292	38.929	38.475	37.037	36.815	27.972	28.592
TDR & 6σ activities	15.515	9.566	13.218	8.343	12.856	8.144	12.707	8.062	12.234	7.800	11.795	7.555	11.192	7.214	10.648	6.903	8.042	5.361
Management responsibility(3/4)	0.863	0.816	9.195	8.899	10.509	10.208	11.050	10.750	12.766	12.480	14.359	14.102	16.545	16.352	18.519	18.408	27.972	28.592
Management responsibility(4/4)	0.648	0.612	6.897	6.674	7.881	7.656	8.287	8.062	9.574	9.360	10.769	10.577	12.409	12.264	13.889	13.806	20.979	21.444
Management responsibility(Quantitative)	11.131	21.875	9.483	19.077	9.223	18.624	9.116	18.436	8.777	17.837	8.462	17.275	8.029	16.496	7.639	15.785	5.769	12.259
Management resposibility(qualitative)	1.511	1.276	16.092	13.904	18.390	15.950	19.337	16.797	22.340	19.501	25.128	22.035	28.954	25.550	32.407	28.762	48.951	44.675
Management responsibility(total)	10.591	23.151	17.529	32.981	18.809	34.573	19.337	35.232	21.011	37.337	23.077	39.310	27.007	42.046	30.556	44.547	47.552	56.934
IT utilization in sales activity	3.373	3.189	2.874	2.781	2.795	2.715	2.762	2.687	2.660	2.600	2.564	2.518	2.433	2.405	2.315	2.301	1.748	1.787
Integrity	10.119	9.566	8.621	8.343	8.385	8.144	8.287	8.062	7.979	7.800	7.692	7.555	7.299	7.214	6.944	6.903	5.245	5.361





< Figure 6: Simulation - Change of the Dominant Power “Management Responsibility” (Score) >

	0.08		1		1.175		1.25		1.5		1.75		2.125		2.5		5	
Indicator	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2
Total	1.4824	1.568	1.74	1.798	1.789	1.84175	1.81	1.8605	1.88	1.923	1.95	1.9855	2.055	2.07925	2.16	2.173	2.86	2.798
Collecting the bill	0.15	0.45	0.5	0.45	0.5	0.45	0.5	0.45	0.5	0.45	0.5	0.45	0.5	0.45	0.5	0.45	0.5	0.45
Electric Quality Control	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
TDR & 6σ activities	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15	0.23	0.15
Management responsibility(3/4)	0.0128	0.0128	0.16	0.16	0.188	0.188	0.2	0.2	0.24	0.24	0.28	0.28	0.34	0.34	0.4	0.4	0.8	0.8
Management responsibility(4/4)	0.0096	0.0096	0.12	0.12	0.141	0.141	0.15	0.15	0.18	0.18	0.21	0.21	0.255	0.255	0.3	0.3	0.6	0.6
Management responsibility(Quantitative)	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343	0.165	0.343
Management resposibility(qualitative)	0.0224	0.02	0.28	0.25	0.329	0.29375	0.35	0.3125	0.42	0.375	0.49	0.4375	0.595	0.53125	0.7	0.625	1.4	1.25
Management responsibility(total)	0.157	0.363	0.305	0.593	0.3365	0.63675	0.35	0.6555	0.395	0.718	0.45	0.7805	0.555	0.87425	0.66	0.968	1.36	1.593
IT utilization in sales activity	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Integrity	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15



This method is feasible because the current performance evaluation is implemented twice a year, tentative and final. In tentative evaluation, we can collect the actual result of all indicators. Based on this result, we decide the proper gap of grade of indicator “Management responsibility by simulation. As a result, we can establish the gap of the indicator evaluated by relative method considering the dominant power of all indicators.

The grade evaluation method

The percentage mark and the scale of the grade

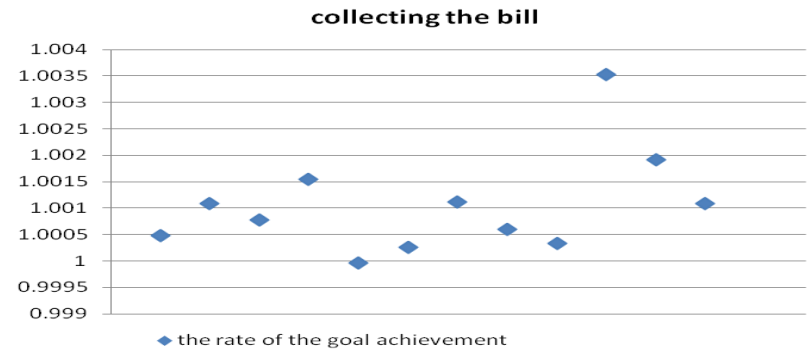
When we use the grade evaluation method, there are two things to consider. First, we decide how many grades use in the evaluation. The methods frequently used are the five grades, the seven grades, and the nine grades. It depends on the number of subject. If there are more than 15 subjects, the seven grades method is usually employed. If the number of subject is less than 15, five grades method is useful.

Second, the percentage mark or scale of the grade is more complicated. Various factors should be considered such as the distribution of score, the feature of the indicator, and the use of the evaluation result. For example, the result of the evaluation is used to distribute the limited resource to members of the organization such as incentive or promotion. In this case, making an order is important. Therefore we should choose the percentage mark and the scale of grade that is easy to make an order in the result of evaluation. If the feature of the indicator is boost competition, not simple management, we employ the method like unequal grade and finely divided grade. When the score is widely distributed and the difference of the score is meaningful, we should also use the scale of grade and percentage mark to present that feature.

Considering these things, we set the scale of the grade, equal or unequal. We set the equal grade with the same percentage marks such as 85%, 90%, 95%, and 100%. Otherwise, we use the unequal grade with the different percentage marks like 85%, 92%, 95%, 97%, and 100%. When the scores are widely distributed or closely gathered, this method is useful. We build the grade unequally corresponding to the distribution of the score. The <Figure 7> below shows the distribution of the indicator 'collecting the bill'. In 2010, the grade has the equal gap by 0.05%. According to the rate of the goal achievement, grade is set by five class like S, A, B, C, D. However, the real score of offices are all placed in S and A grade. In this case, we can also set up the gap of the grade unequally. With the result of colleting the bill in 2010, we set up the grade like the <Figure 8>. The unequal gap of the grade is useful when the indicator is needed to boost competition, considering the feature of the indicator. This method can be also employed to the case that discrepancy between the score is meaningful. The result of the evaluation is used to distribute the limited resource to members of the organization. In that case, making an order is important. Therefore we should choose the percentage mark of the grade is easy to make an order in result of evaluation.

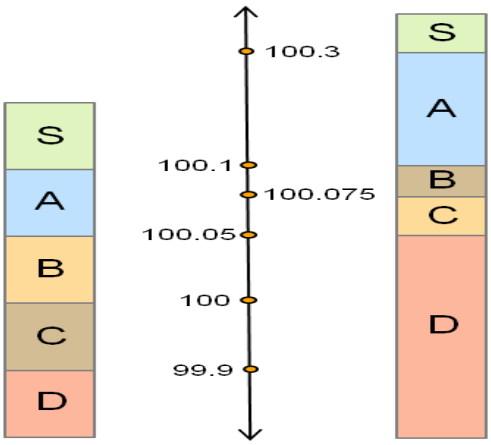
< Figure 7: Distribution of the Score 'Collecting the Bill' in 2010 >

Grade	S	A	B	C	D
%	100.1	100.05	100	99.95	99.9
Gap	-	0.05	0.05	0.05	0.05
the number of office	11	1	0	0	0



< Figure 7: Example of Grade Scale >

Grade	S	A	B	C	D
%	100.3	100.1	100.075	100.05	99.9
Gap	-	0.2	0.025	0.025	0.15



This is just one example of various methods. When we use the grades evaluation method, we should consider a lot of things such as the purpose of evaluation, the feature of the indicator, the current management issue, and so on. Therefore, the deeper and more specific studies are needed for this topic. We remain this theme for further research.

Ⅳ Conclusion(Administrative Recommendations)

The purpose of the performance evaluation for SOEs is to make it efficient and to boost competition in it. In line with this aim, KEPCO also motivate their members to achieve the goal using the performance evaluation system of its own. Our performance evaluation system has slightly changed in method, period, and indicators and showed different aspect each year. Recently, some indicators show some problem to have a dominant power to determine the final result in 2009 and 2010.

This study begins with an idea that the adequate evaluation method should be employed corresponding to the feature of indicators in order to gain the reasonability of evaluation system. The evaluation methods in this study are limited on absolute or relative method. To examine this idea, this study reviews the performance evaluation system of Busan district division of KEPCO critically focusing on the evaluation method as follows.

1. We classify the indicators by evaluation method from 2006 to 2010.
2. This study examines whether the evaluation methods are used adequately for reasonability in terms of measurability, distribution, and balanced weight over the past five years.
3. Based on results above, we suggest the improved evaluation methods. First, All quantitative indicators should be employed five grades absolute method. Second, qualitative indicator used by relative method have to be controlled its dominant power by reducing the gap of each grade.
4. To prove this suggestion, this study simulates the adjusted method with the result of evaluation in 2009 and 2010.
5. With the result of simulation, we also recommend the some specific method related with the use of five grades method.

In classification of indicators by the evaluation method, we find out distinctive features of the performance evaluation system for the past five years. In the period from 2006 to 2008, most indicators are employed the five grades method. In 2009, three quantitative indicators are used relative method with the forced discrimination method. In 2010, most indicators are evaluated by five grades absolute evaluation method, except of one qualitative indicator.

This study analyzes the evaluation system in terms of measurability, distribution, and balanced weight for the past five years. First, qualitative indicators should be evaluated with the relative method, because of the feature that it is hard to measure by exact number. In this respects, the evaluation system of BDD of KEPCO is adequate for measurability.

Second, to inspect the reasonability of the evaluation system, we should consider the distribution of score. In 2009, three quantitative indicators ‘collecting the bill, electric quality control, and utilizing facilities, are used relative method with the forced discrimination. However, these indicators have no huge distribution between score of branch offices. Therefore, the relative method might be used inadequately to these three indicators in 2009.

Some indicators affect the final result. However, it is not reasonable that a few indicators have huge dominant power to determine the final result. Through the analysis, we can find that indicators with relative method, both quantitative and qualitative, have a huge dominant power. During the period from 2006 to 2008, a few indicators have strong influence to final result. However, the power is not huge as much as indicators using the relative method. In 2009, three quantitative indicators, collecting the bill, electric quality control, and utilizing facilities, determine the final result with dominant power. The indicators “Management Responsibility and Electric Quality Control” even have the higher gap than that of total score. The evaluation system in 2010 employs the five grades method to all indicators. While quantitative indicators are evaluated by the five grades absolute method, one qualitative indicator employs the five grade relative method. As a result, only one indicator with relative method has dominant power to determine the final result.

Based on the result of the previous analysis, this study recommends that five grades method system. Qualitative indicator with relative method should be controlled its dominant power by reducing the gap of each grade. With this method, we simulate the result of

evaluation in 2009 and 2010. After employing the five grades absolute method, the dominant power of three indicators is decreased in 2009. In 2010, the dominant power of indicator with relative method is controlled after reducing the gap of each grade.

When we use the grades evaluation method, we should use the number of grade, the percentage mark, and scale of grade differently considering the distribution of score, the feature of the indicator, and the use of the evaluation result.

In conclusion, this study recommends the five grades evaluation method in which absolute method for quantitative indicators and relative method for qualitative indicators. In case of relative evaluation method, the gap between each grade should be reduced corresponding to indicators used absolute method.

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