CEO COMPETITIVENESS:
CEO TYPE VS. ECONOMIC DEVELOPMENT OF NATIONS

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ABSTRACT

This study reconsiders CEO (Chief Executive Officer) types by country in terms of competitiveness and also inquires CEO types and levels on each country group under categories regarding economic development stages, namely, Subject Dependent (SD), Environment Dependent (ED), Resource Dependent (RD), Mechanism Dependent (MD) and Creative Destruction (CD). To form variables for CEO types, s, e, r, M factors were utilized for competitive factors in the 'Nine-factor' model, and the variables needed for the development stages in CEO types were formulated with these s, e, r, and M factors. Most of previous studies regarding the categorization of CEO types used qualitative methods, with their types being categorized under subjective standards. By contrast, this study is unique in the sense that it covers the overall CEO competitiveness of each country which inquires the demanded issues for CEOs reflected in each development stage, and thus, enlightens us on the efforts needed for the future.

Key Words: CEO's competitiveness, Subject dependent style, Environment dependent style, Resource dependent style, Mechanism dependent style

INTRODUCTION

Today's society is driven by economic strength. Economic strength stems from the activities of a firm, which works like a living organism. The firm is driven by the chief

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executive officer. Today's CEOs and entrepreneurs are field command offices in an economic war being waged in every corner of the world. In his inaugural speech, former U.S. President Ronald Reagan announced, "Entrepreneurs are hero that create jobs, wealth, and opportunities." Formal Samsung Chairman Lee Byung Chul said, "A CEO enjoys an unparalleled joy of creation when he or she thinks of a company, makes it happen, runs it rationally, and develops it into newer stages as the needs of the country change over time."

Today's CEOs and entrepreneurs are not merely the heads of a company, but also the holder of the key to national success. That is why it is greatly significant to study the CEO types by the stages of economic development of a country. A free economy is led mainly by firms, which are, in turn, run mainly by entrepreneurs. As has been proven in the advanced countries' experience, the growth and development of a nation depends on the number of good entrepreneurs at a given time.

In the meantime, a nation needs different types of CEOs as its economy moves onto different stages. In the U.S., the era of the industrial revolution witnessed the kind of entrepreneurs that created wealth out of nothing, like Andrew Carnegie, John D. Rockefeller, and John Pierpont Morgan. Later, in the 1920s, when the economy was rapidly growing, strategists like Henry Ford, Alfred P. Sloan, and Thomas Watson won the competition with the efficient production and creative marketing. In the 1980s, Jack Welch, Lou Gerstner, and Albert Dunlap, well-known restructuring experts, emerged as successful CEOs. A knowledge of the best CEO type in a given economic development stage of a country would help that country to prepare for the next stage of economic development so that the economy may grow more efficiently. Thus, having the right type of CEOs in different stages of economic development is crucial to the national competitiveness and the hypothesis that a nation's competitiveness relies on the type of CEO's is also proven in "The Nine-Factor Model" of Cho (1994).

What types of CEOs are necessary in the stages of LD developing nations, semi-developed, and a developed country respectively? The answers to these questions can explain the roles of CEOs and the competitiveness of the country as its economy develops. The answers will also present opportunities to check the economic development stage of the country and to identify the required roles and competences of CEOs in the nation. A valid conclusion in this study that the CEO style must change over time will tell China, a nation in the developing country stage, Korea, a semi-developed country and Japan, a developed country, what types of CEOs are needed, respectively.

This study can also present a new paradigm of the CEO theory by identifying the CEO type as a consistent framework. For those purposes, this study categorizes the CEO types into SD, ED, RD, MD, and CD, whose characteristics are mapped into the nine factors of "The Nine-Factor Model." The study goes further on to discuss the roles and functions required of the CEOs in each of the different stages of economic

development, base on the data in the IPS National Competitiveness Report 2002, published by The Institute for Industrial Policy Studies (2002). The data on China, Korea, and Japan are compared to analyze the levels of CEO competitiveness in the three countries, and to find out what needs to be complemented for greater competitiveness of CEOs.

THEORETICAL BACKGROUND

Traditionally, the studies of CEOs have been conducted in the field of human resources and organization management. The majority of such studies focus on the CEO leadership to discuss the characteristics in case studies. Many others concentrate on the effects of the company characteristics on the CEO and/or the compensation plans. For instance, David, Gabriel, and Robert compared in their study the transactional CEO leadership and the charismatic CEO leadership based on the financial achievements of the CEOs under the perceived environmental uncertainty. They also proved the assumption that the CEO leadership attributes and performances depend on the perceived environmental uncertainty. In their study, the three were able to conclude that charismatic leadership can produce predicted performances under uncertainty while that's not the case without uncertainty. The study, however, differentiated the CEO types only into the transactional and the charismatic leadership and stopped at the CEO performances in each leadership style, thereby falling short of providing enough CEO types.

Hambrick and Mason (1984) studied the circumstantial effects on the CEO recruitment to conclude that the cognitive styles and the personality constructs are the most important of all elements of the appropriateness of the CEO to the organization and that the leadership styles vary on the characteristics, times, and functional background of the observable corporate properties. The study dealt with nothing but the CEO experiences.

Waldman and Yamarino (1999) looked into how the charismatic CEO leadership affects the organizational performances based on the level of management and the level of analysis effects, which are the basis of leadership categorization Shaeffer (2002) categorized the CEO leadership styles into Autocrats, Participative leaders, and Reformers. He contended the definition of leadership may vary on the market demand. However, his study is subjective, with no objective or specific data presented. Shin Wan-Sun (1999) divided the CEO types into total-control and total-freedom, which were further broken down into delegation, participation, persuasion and dictation. This model is also subjective with limited data. This study can be differentiated from the above studies of competitiveness to categorize and compare the CEO types, utilizing the specific data on the competitiveness. This study also discusses the CEO types and CEO competitiveness of China, Korea and Japan,

including the implications and outlook for the future.

DEVELOPMENT OF THE CEO TYPES

Cho (1994) identified 9 factors as the determinants of a nation's competitiveness. These 9 factors include 4 physical factors, 4 human factors, and the external environment. The 4 physical factors include factor conditions, business context, related and supporting industries, and demand conditions. The 4 human factors include workers, politicians and bureaucrats, entrepreneurs, and professionals. Cho (1994) also proposed that each factor varies in terms of its contribution depending on the level or stage of economic development of a nation in the following manner: when a nation's economy is at the underdeveloped stage, it still possesses (unskilled) workers and certain factor conditions such as natural resources. Yet it lets these factors to be wasted and unused. When a political leader with the vision emerges, the nation moves to the stage of developing economy. The political leaders with the bureaucrats would build the production system and roll the machines to manufacture products, which would be readily absorbed by domestic and overseas market, thereby creating the demand conditions. Yet, entrepreneurs are passive, since they would not take risks unless the government provides them with various safety nets. When entrepreneurs seize business opportunities that would result in satisfactory returns, they take the initiative in investment, and move to various industries slowly and gradually to spawn related and supporting industries to one another. With their leadership in the economy, the nation advances to a semi-developed stage. This is when professionals such as managers, engineers, and designers take over the control of the firms from the hands of entrepreneurs that the nation moves to the developed stage of economy. At this stage, the nation rides on the business context within which the market economy moves without visible hands. In his later study, Cho (1998) proposed that the Nine-Factor Model could be equally applied to measuring the level of competitiveness of any entity. He showed ways to measure the competitiveness of not only nations but also the globe, regional blocs, clusters in or across cities, industries, and firms by combining the Nine-Factor Model and the "ser-M Model" that Cho and Lee (1998) proposed. In essence, he argued that one should know all of the nine factors regardless of the entities that one wanted to measure their competitiveness, but that one should also understand that each factor might change its role among as the subject, as the environment, as the resource, and as the mechanism. For instance, one should know 'politicians and bureaucrats' to measure the competitiveness of any entities, but their role would be changed from 'as the environment' in the case of a firm's competitiveness and an industry's competitiveness to 'as the subject' in the case of a city's competitiveness, the nation's competitiveness, and the bloc's competitiveness.

Table 1. The integrated model in the CEO level

Factor / Ser-M	Stage / 9-Factors	Subject dependent stage	Environment dependent stage	Resource dependent stage	Mechanism dependent stage	Creative destruction stage
S	Politicians & Bureaucrats		×			
	Entrepreneurs*			×		
	Professionals & CEO*				×	
e	Demand Conditions				×	
	Chance Events					
r	Endowed Resources	×				
	Workers	×				
	Related & Supporting industries			×		
	Entrepreneurs*					
	Professionals*					
M	Business Context		×			

Development stage of CEO style in the national

IPS National competitiveness Report (2002) categorized the country groups into DC (Developed Countries), SDC (semi-Developed Countries), DIC (Developing Countries), LDC (Less Developed Countries) and RBC (Resource-Based Countries). This study uses the categorization and data of the report to identify the best CEO types for each of the country groups and their required competences, attitudes and future implications.

Stage 1: RBC and LDC

In this stage, entrepreneurs emerge to build a company with resources and manpower, which are available but development may be useless unless utilized. This is a time of subject-development.

Stage 2: DIC

In this stage, the government, an environmental factor, helps the company grow

by offering environmental opportunities such as friendly policies. CEO's in this stage actively respond to the rules of the game made by the strong influence of the government, and capture opportunities in the surroundings, That is, this time can be dubbed as the Environmental Dependence stage.

Stage 3: SDC-Korea

In this stage Resource Dependence stage, the government retreats the CEOs equipped with the capital and the resources reinforce the environment and resources needed for his or her company, while throwing away unnecessary surroundings and resources. The CEOs in this stage act as entrepreneurs by re-creating the environment.

Stage 4: DC- Japan and the United States

The ownership management reaches its limitations giving way to professional CEOs who possess strategic mindset and leadership. This is a so-called mechanism-dependence stage where a company runs on a mechanism.

Stage 5: Post-DC

Mechanism ultimately reaches its own set of limitations. The maturation of advanced firms is a case in point. In this stage, a subject who can capture new opportunities by re-creating resources and environment, like the former British Prime Minister Thatcher, emerges to experience the so-called Creative Destruction. The stages are shown in Figure 2 as a framework of this study.
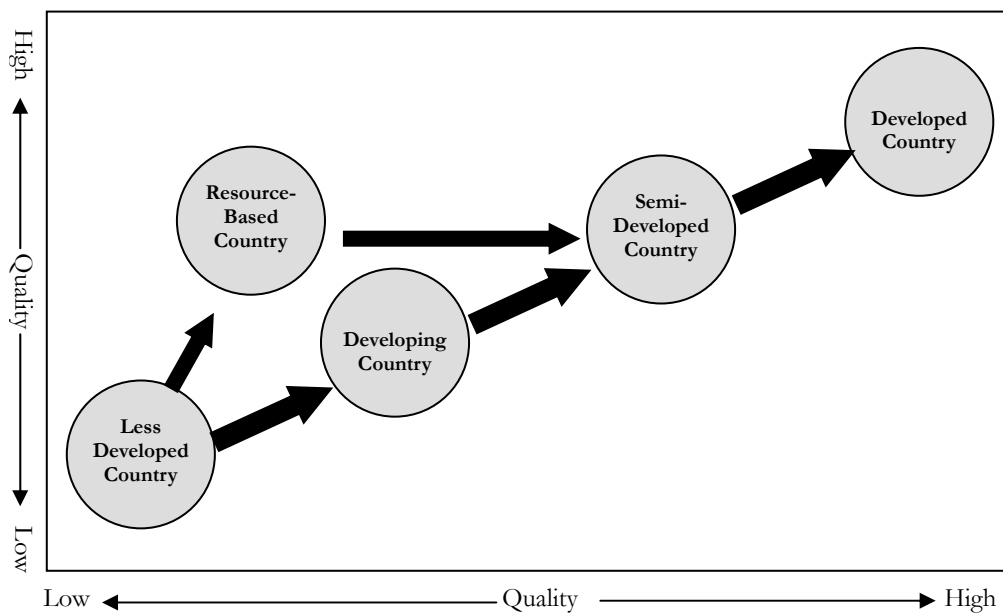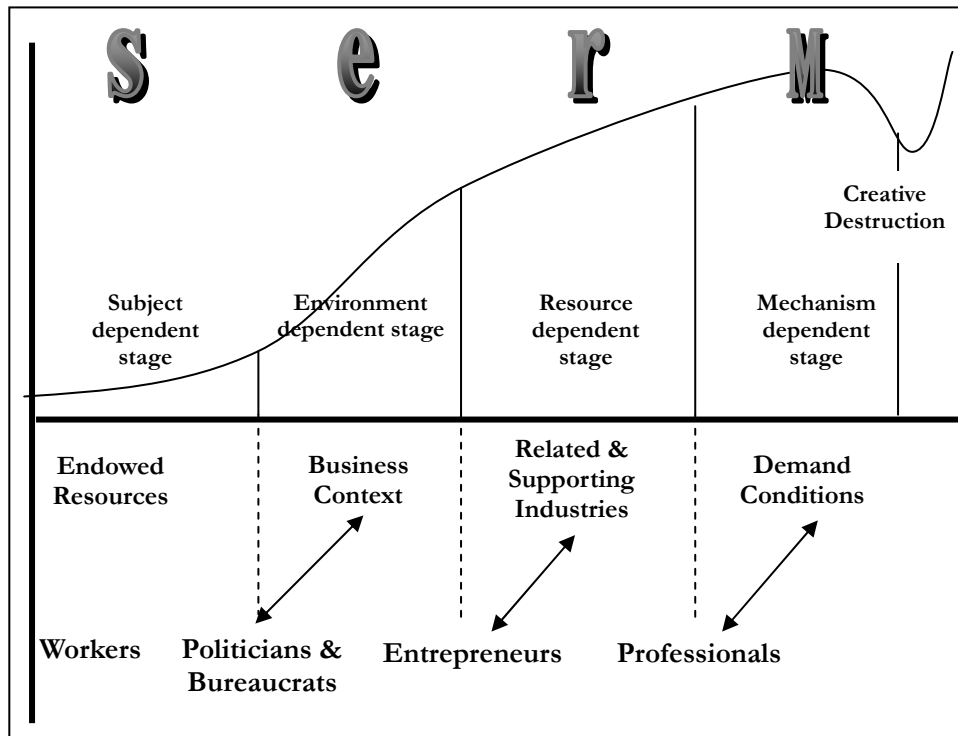
Figure 1. Stage of economic development

Figure 2. Framework of this study

Development of the CEO type

Applying the model in Cho (1998) to the CEO as the entity of competitiveness, we can also systematically identify the factors of 'CEO competitiveness.' Table 1 shows a modified version of the Cho (1998) model with the CEO perspective. It takes into account the changes in the characteristics of each factor as the stage of economic development moves from one to the next. For example, workers are cheap and unskilled in the underdeveloped economy, cheap and semi-skilled in the developing economy, expensive and semi-skilled in the semi-developed economy, and expensive and skilled in the developed economy.

The Table shows that CEOs must start from scratch at the underdeveloped stage of economy as there would be no support from an unmotivated and ineffective government. Although there are crude resources and unskilled labor, they are not much of a help.

When the economy moves onto a developing stage, CEOs start to take risks under the visionary political leaders who will provide floors underneath their

venturesome businesses. CEOs can now take advantage of government-supplied capital supplied, unsaturated domestic demand that is heavily protected from the invasion of foreign products, and the infrastructure also provided by the government. When the economy moves to a semi-developed stage, not only entrepreneurs but also professional managers play the role of CEOs. Now CEOs can utilize internally developed technology pool, expensive and semi-skilled labor, and efficient administration. In the developed stage of the economy, CEOs are mainly professionals, and they depend on internal R&D capabilities, external global network, strategic alliances with global partners, and they are handsomely rewarded with lucrative compensation.

Table 2. The integrated model in the CEO level

		Physical Factors				Human Factors		
		Factor Conditions	Demand Conditions	R&S Industries	Business Context	Workers	Politicians & Bureaucrats	Entrepreneurs	Professionals
LDC	S							CEO:: Start-from-Scratch Entrepreneur	
	E					No Union	Unmotivated and ineffective leader		
	R	Crude Resources				Cheap Unskilled			
	M								
DIC	S							CEO: Risk Taker (JY Chung)	
	E	Capital supplied by government*	Protected and unsaturated demand*	Basic Infrastructure*	Rule Setting*	Weak Union*	Visionary leader (CH Park) Strong Government*		
	R					Cheap Semi-skilled			subservient Manager
	M		Facilitating Business					Incentive for Growth	

SDC	S							CEO: Risk Manager (KH Lee)	CEO: Management specialist
	E		Trade& FDI, Open-Door Policy		Rule Implementing	Militant Union	Authoritative Supporter		
	R	Technology*				Expensive Semi-skilled*			Efficient administrator*
	M			Creating Synergies				Penalty for Misbehavior	
DC	S							CEO: Business Creator (W. Gates)	CEO: Leaders of society (J. Welch)
	E		Global Market	Advanced Infrastructure		Cooperative Union	Democratic Supporter (Clinton)		
	R	Design, Brand				Expensive Skilled			Network with the external expert
	M	R&D*	Global network*	Alliance with global partners*	Rule Refining*		Rational Government*	Reward for real value creation*	Lucrative compensation*

* : significantly contributing to CEO competitiveness

The conceptual hypotheses are as follows:

Hypothesis 1. SD is the biggest in LDC.
Hypothesis 2. ED is the biggest in DIC.
Hypothesis 3. RD is the biggest in SDC.
Hypothesis 4. MD is the biggest in DC.

METHODS

Sample nations, Manipulation, variables, measures

For each stage, key factors are mapped into s (Subject), e (Environment), r (Resources), and M (Mechanism), each of which are named to be the SD CEO, the ED CEO, the RD CEO and the MD CEO, respectively. For each of the factors in the ser-M model, the key variants were taken except for the overlapping ones in the 9 factors used in the IPS NCR2002. For the "s" factor, endowed resources and workers are taken as most important for the competitiveness in the early stage of economic development. For "e", business context and the government competitiveness are taken as the important variants. In particular, the government role is important for the transition from the early stage to the environment-creating stage. For the "r" factor, related and supporting sectors and the entrepreneur's competitiveness are used for analysis. For the "M" factor, demand conditions and the role of CEO are taken to measure the competitiveness.

The variants drawn for the s, e, r, M factors are taken to create a new group of variants.

First of all, main elements for each stage are s (subject), e (environment), r (resources), m (manipulation) with S meaning SD (subject dependence), E meaning ED (environment dependence, R meaning RD (resources dependence and M meaning MD (mechanism dependence). S, e, r and M exclude common elements among IPS NCR2002's 9 factors and pick the most important element out of what makes up each part to use it as a variable for measurement.

At the early stage of s (subject), competitiveness of endowed resources and workers are considered important and become s's variable. E uses competitiveness of the business context and the government for variable. During the early stage, the government is considered a main player in leading the movement towards an environment creation level. R (resources) puts importance on competitiveness of related and supporting areas and entrepreneurs, and uses the competitiveness to create variables for analysis. M (mechanism) assumes that the role of demand conditions and entrepreneur are important and measures mechanism by a means of their competitiveness.

S, e, r and M – created by the method mentioned above – 1) make up the variables with a focus on the CEO, 2) use them under the consideration of the development stages of CEO types, and 3) establish a new variable group. First, the SD-type CEO (SD: subject dependence) is on an early stage getting just out of a first level of every type. It means that a growth-centered development is more important than the CEO's role, according to the environment surrounding the company. During this time, roles of the nation, government and officials are considered important. Therefore, s (subject) elements are assumed as a main factor and are used for

measurement. Second, ED-type CEO (ED: environment dependence) puts importance on environmental factors and uses e (environment) for measurement. Third, the RD-type CEO (RD: resources dependence) decides company's physical and human resources are important and uses r (resources) for measurement. Fourth, the MD-type CEO (MD: mechanism dependence) thinks – besides s (subject) - m (mechanism) elements are important and uses it for measurement. Fifth, the CD-type CEO (CD: creative destruction) breaks an existing mechanism and creates a new order in a reformative way. It is difficult to measure them and their complicated internal mechanism with s, e, r, and M, which is why they are not included in the statistical analysis. For variable comparison, a scandalized scale is made with 100 as a top score. Table 3 shows how it is organized.

Table 3. Variables and its composition

Variables	Composition of variable	index
S	Endowed resources + workers	Competitiveness
E	politicians & bureaucrats + business context	Competitiveness
R	entrepreneurs + related & supporting industries	Competitiveness
M	professionals + demand conditions	Competitiveness
SD(Subject Dependence)	S	
ED(Environment Dependence)	E	
RD(Resource Dependence)	R	
MD(Mechanism Dependence)	M	
Nation group	DC, SDC, DIC, LDC, RBC	IPS NCR2002

Samples and data use IPS NCR2002's data and 68 nations for analysis, not to mention nation categorization[1]. The hypothesis is as follows.

Hypothesis 1. SD is the biggest in LDC.
Hypothesis 2. ED is the biggest in DIC.
Hypothesis 3. RD is the biggest in SDC.
Hypothesis 4. MD is the biggest in DC.

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[1] According to IPS NCR2002, Nation Group gets divided by DC(Developed Countries), SDC(Semi-Developed Countries), DIC(Developing Countries), LDC(Less Developed Countries), and RBC(Resource Based Countries).

Analyses

IPS NCR2002's data and nation categorization are used for analysis. MANOVA (multivariate ANOVA) was conducted to find out the differences between s, e, r, and M, and SD, ED, RD, MD, and CD. TYPE Ⅲ's full factorial model was used to verify interaction between main effect, covariance effect and factor-to-factor. For detailed analysis, Duncan method and Dunnettt's T3 were used as a *post hoc* test. Covariance matrix (Method 2) was applied to verify how accurate they are. Pearson correlation test was used to analyze correlation between variables.

RESULTS

TABLE 4 shows a total average, standard variation and relation analysis of SD, ED, RD, and MD. R - Sample correlation coefficient for correlation analysis – is used to estimate ρ – population correlation coefficient. In verifying ρ – population correlation coefficient -, r value – sample correlation coefficient - and proper marginal value are compared. Its verification needs the assumption that the two variables have to come within a regular distribution. That ρ equals 0 can be proved with the following process and t verification statistics.

① Null Hypothesis(H_0): ρ =0

② Test Statistic: r

③ Critical Region   (a) H_1: $\rho \rangle 0$ r≥r(n-2)

(b) H_1: $\rho \langle 0$ r≤r(n-2)

(c) H_1: $\rho \neq 0$ I r Ir(n-2)

④ $t = r\sqrt{\dfrac{N-2}{1-r^2}}$ df=N-2

Here, Pearson analysis method is used for correlation analysis. The result shows the RD-MD average is bigger than the SD-ED average, which took 2002 nation's competitiveness report for reference. Competitiveness is concentrated on r and M more than other elements per nation's groups. It means that the size of the nation's group does not count. Rather, on an absolute standard, r and M are larger by nation's groups. CEO elements vary according to each nation's group, which will be explained

further later.

Table 4. Descriptive statistics and correlation of CEO style

Variable	Mean	s. d.	1	2	3	4
1. SD	35.9386	19.43906				
2. ED	41.2333	26.56793	-.238*			
3. RD	52.5580	28.52554	-.238*	.967*		
4. MD	42.7846	22.98356	-.189	.949*	.966*	

The result shows that there is correlation between ED-SD, ED-RD, SD-RD, DE-MD, MD and RD. As for correlation, ED and SD are negative; SD and RD are negative, while, ED-MD, ED-RD, and MD-RD are strong positive. But there is no correlation between SD and MD. When the SD variable is removed, the alpha value rapidly increases to 0.9828. More accuracy can be gained by deleting or correcting the variable. Reliability means the degree of how consistent the measurement result is, regardless of time, method, survey, evaluator and subject group. In other words, comparable measurement method always leads to similar results in a consistent manner. There are four reliability-measuring methods: test-retest method, parallel-forms techniques, split-half method and internal consistency reliability. The internal consistency reliability method is most commonly used to measure reliability. It uses Cronbach's Alpha coefficient to measure reliability of the item. There is no unified standard telling how much the measurement coefficient should be. Nunally said that 0.5 ~ 0.6 and over would be good and basic research did not necessarily need 0.8 and over.

This research set Cronbach's Alpha's level at 0.6, which is considered reliable in social science. This standard is used for every item. Whether there is a problem with alpha if item deleted was also checked. As a result of reliability measurement, SD, ED, RD and MD showed an alpha value at 0.7598 and scandalized alpha at 0.7011 – a high level. In addition, Hotelling's T-Squared value showed 64.2600 (prob. = 0.000) for F, dismissing null hypothesis that all items have the same average and taking an alternative hypothesis that they are all different. It means all variables are reliable. Then, MANOVA was conducted to find out whether there is a difference between DC, SDC, DIC, LDC, and RBC, and if so, how different they are. First, MANOVA is checked to see if it is appropriate to use it. Second, the hypothesis is checked to see if there is nothing wrong. MANOVA's statistical requirements are also checked using Pillai-Bartlett Trace statistics, Wilk's Lambda's statistics, Hotelling-Lawley Trace and Roy's largest characteristic root. Third, a post check is made. Table 5 shows the analyzed results.

The result tells that Pillai-Bartlett Trace statistics, Wilk's Lambda's statistics, Hotelling-Lawley Trace and Roy's largest characteristic root, all of which are used to

prove statistical consideration, led to the conclusion that all of them have something to take note of. For example, Hotelling Trace is used mainly to analyze difference between two groups not three groups.

Table 5. Multivariate test result

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.974	555.608(a)	4.000	60.000	.000
	Wilks' Lambda	.026	555.608(a)	4.000	60.000	.000
	Hotelling's Trace	37.041	555.608(a)	4.000	60.000	.000
	Roy's Largest Root	37.041	555.608(a)	4.000	60.000	.000
GROUP	Pillai's Trace	1.182	6.603	16.000	252.000	.000
	Wilks' Lambda	.046	20.011	16.000	183.941	.000
	Hotelling's Trace	16.118	58.933	16.000	234.000	.000
	Roy's Largest Root	15.846	249.573(b)	4.000	63.000	.000

a Exact statistic

b The statistic is an upper bound on F that yields a lower bound on the significance level.

c Design: Intercept + GROUP

According to the result, null hypothesis that there is no difference in CEO by groups can be dismissed. In other words, CEOs are different by groups in a significant way. Analysis of levene's verified statistics, which is to verify an error distribution is the same, shows that F statistics are 0.404, 3.778, 0.266, and 0.905. When setting α at 0.05, null hypothesis that all the error distribution of variables is the same excluding ED cannot be dismissed. Table 6 shows the analyzed results.

Table 6. Levene's test of equality of error variance

	F	df1	df2	Sig.
Subject Dependent Style	.404	4	63	.805
Environment Dependent Style	3.778	4	63	.008
Resource Dependent Style	.266	4	63	.899
Mechanism Dependent Style	.905	4	63	.467

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a Design: Intercept+GROUP

Object effect verification also shows SD, ED, RD, and MD are different by nation's groups. R Squared value is as follows.

$$\text{SD: } R^2 = 0.177(\text{Adjusted } R^2 = 0.124)$$

$$\text{ED: } R^2 = 0.890(\text{Adjusted } R^2 = 0.833)$$

$$\text{RD: } R^2 = 0.938(\text{Adjusted } R^2 = 0.934)$$

$$\text{MD: } R^2 = 0.896(\text{Adjusted } R^2 = 0.889)$$

Variables have high R^2 values except SD. Even when K Matrix's contrast is used, SD, unlike other variables, has no significant difference with 0 as an average. Dunnett's T3's multiple comparison and Duncan's *post hoc* test shows DIC and RBC have similar structures each other. Table 7 shows that RD is stronger in DC and SDC, while SD is stronger in DIC, LDC and RBC. Details by nation's groups are as follows.

Table 7. Descriptive statistics

Group	Subject Dependent Style		Environment Dependent Style		Resource Dependent Style		Mechanism Dependent Style	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
DC	27.3290	20.67868	74.1408	12.20816	87.5328	6.84960	70.8525	9.73815
SDC	35.1248	9.49647	45.1291	8.02814	62.0016	9.15347	47.8937	7.25270
DIC	41.6806	19.59347	24.5313	7.99758	34.7842	6.80474	29.3743	5.23126
LDC	31.7320	17.20478	6.3094	3.69272	11.8774	7.86725	11.1186	7.68641
RBC	53.9842	11.92739	28.3551	4.99468	36.3430	7.20611	28.8752	6.69579

DC>SDC>DIC>LDC can be found in all except SD. (RBC excluded) DIC>SDC>LDC>DC is seen in SD. All except SD shows the same development stages as that of FIGURE 3. In contrast, SD shows DIC has a stronger subject dependence than LDC, suggesting that strong leadership is needed the most to move from LDC to DIC and then to SDC. Figure 3 shows that result. Details are as follows by nation's groups.
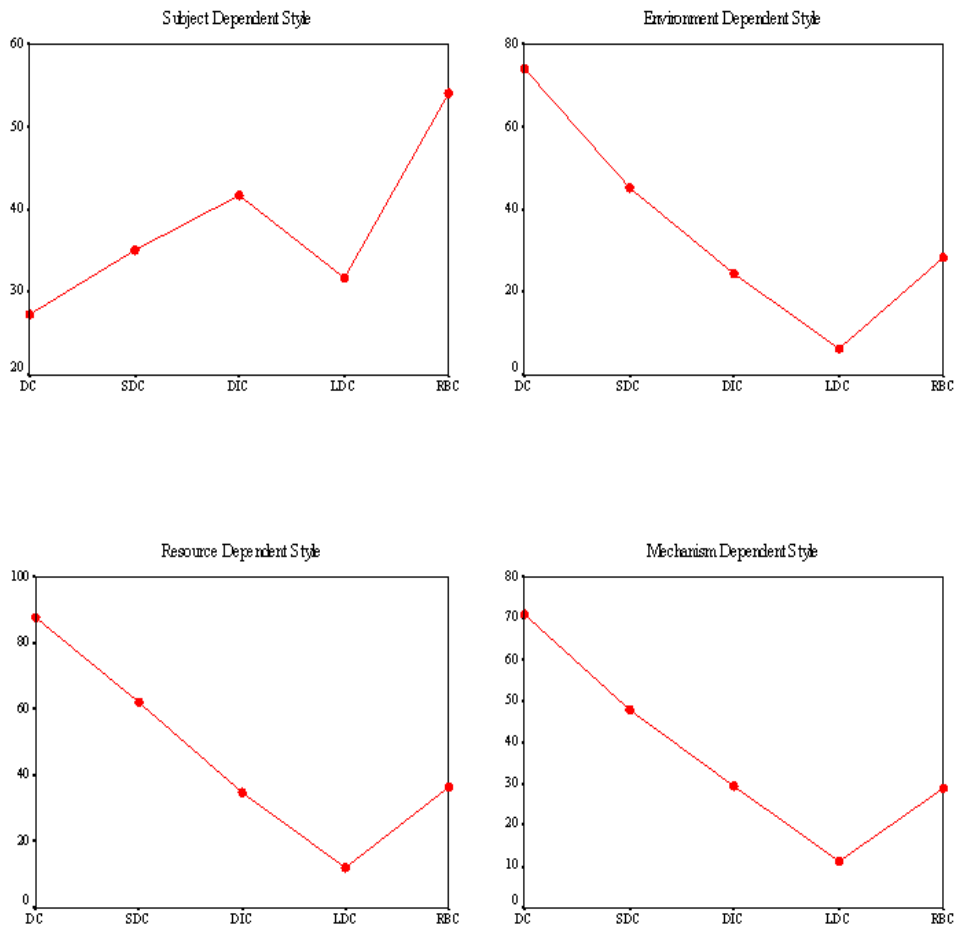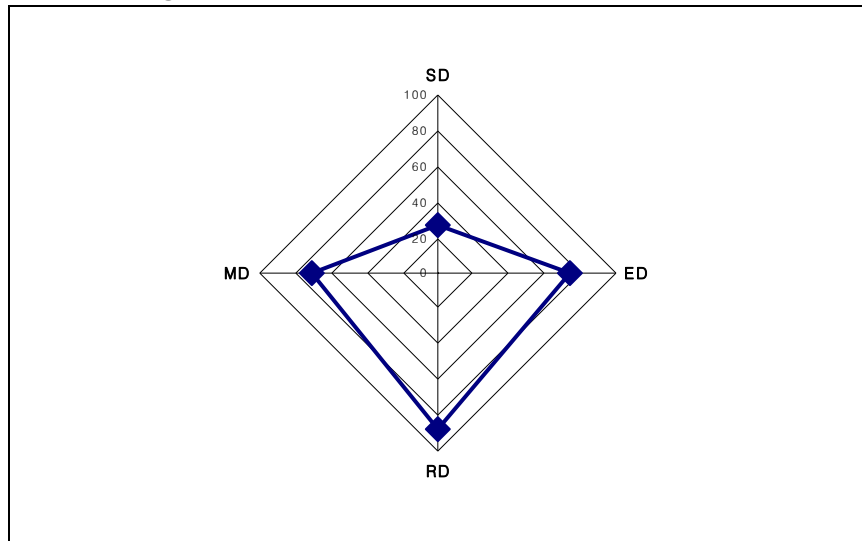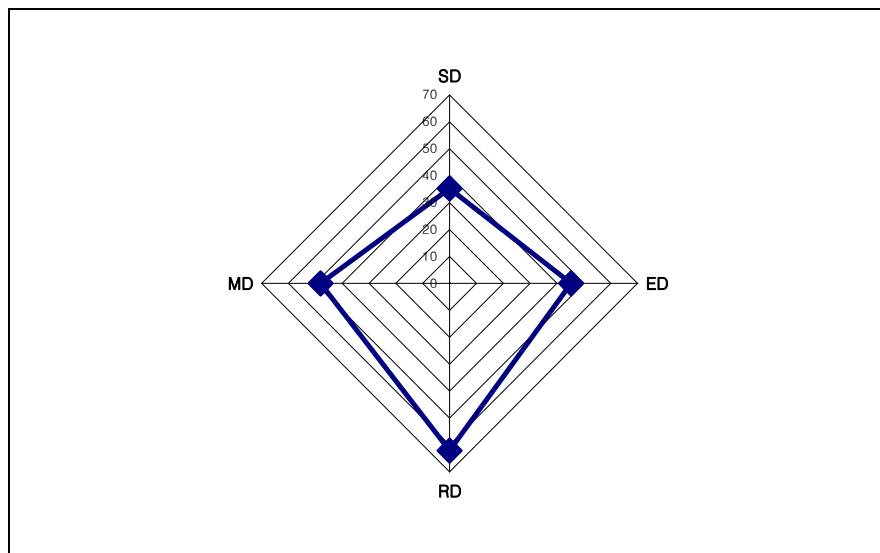
Figure 3. Means plot of variables

Figure 4. Chart of developed countries

DC has high ED, RD and MD with RD the biggest, while there is not much difference between MD and RD. But DC has low SD. Figure 4 shows that result.
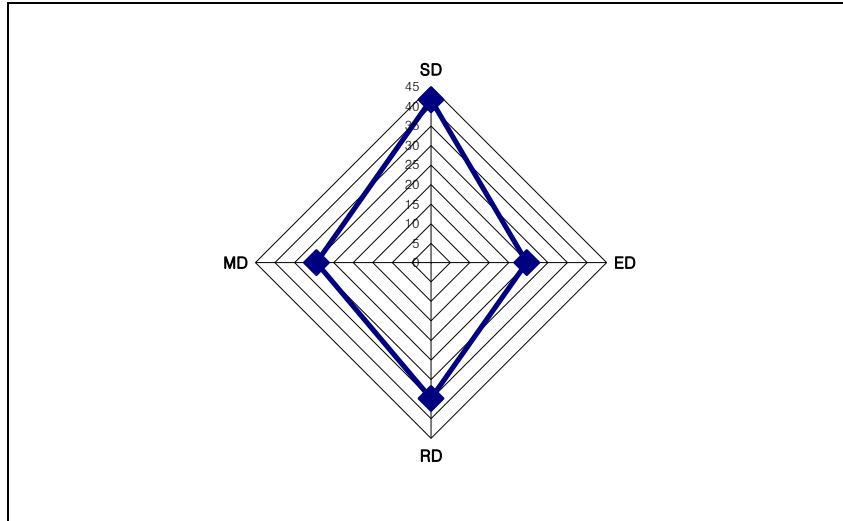
SDC also has strong RD. Unlike DC, RD stands out, compared with ED and MD, suggesting that DC has evenly strong ED, RD and MD and moves onto a MD level, and SDC is on a RD stage in every aspect.
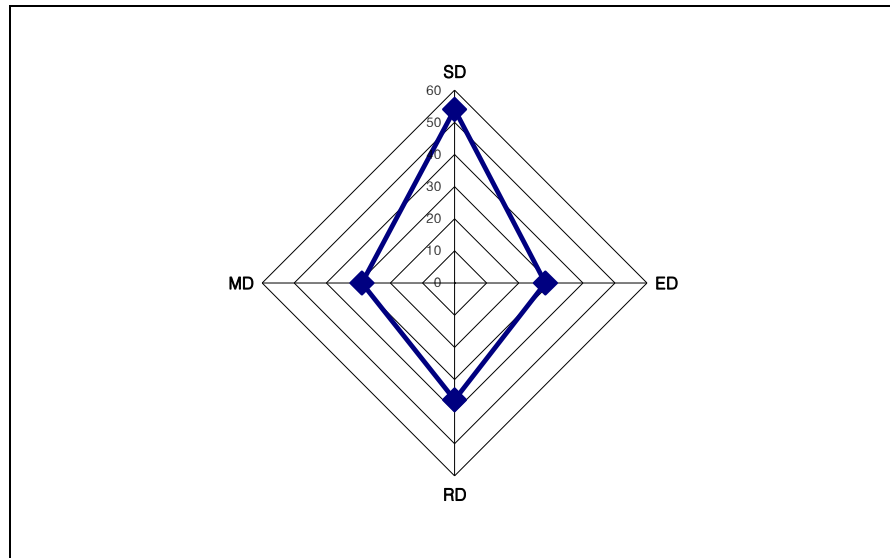
Figure 5. Chart of semi-developed countries

DIC has similar ED, RD and MD with SD pointed out. It is on the stage moving from SD-centered to ED, RD and MD-developed for the next level.

Figure 6. Chart of developing countries

Finally, LDC has almost no development except SD, meaning it is on an initial stage of CEO development and is in the industrial development level where strong subject is needed.

Figure 7. Chart of less developed countries

To sum up, development is made through LDC-SD -> DIC-ED -> SDC-RD -> DC-MD. However, actual analysis tells us that DIC is on a transitional stage from SD to ED, while DC moves from RD to MD. Therefore, hypotheses 2 and 4 should be dismissed or corrected.

HYPOTHESIS TEST

The result is as follows. Analysis shows that LDC is at the early SD stage, DIC in mid-or-late SD, SDC in early-or-mid RD and DC in mid-or-late RD.

Hypothesis 1 and 4 are dismissed. But others are approved.

Table 8. Results of hypothesis test

Hypothesis	Results
Hypothesis 1. SD is the biggest in LDC.	Approved
Hypothesis 2. ED is the biggest in DIC.	Dismissed
Hypothesis 3. RD is the biggest in SDC.	Approved
Hypothesis 4. MD is the biggest in DC.	Dismissed

Comparison between China, Korea and Japan

In the IPS National Competitiveness Report, China, Korea, and Japan belong to different country groups. China belongs to the DIC group, Korea belongs to the SDC group, and Japan belongs to the DC group. Nevertheless, the comparison of data on CEOs of these 3 countries shows that Japan and Korea have strong RD-type CEO and China has an SD-type CEO.

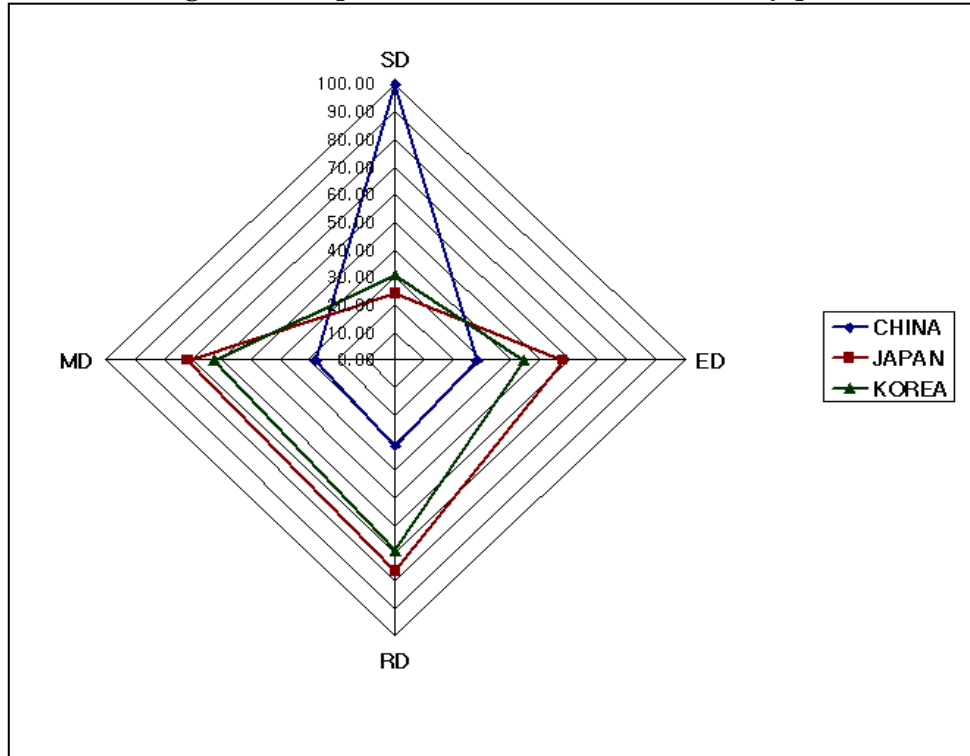**Figure 8. Comparison between China, Korea and Japan**

Figure 8 shows that China has low development of ED, RD, and MD, and high development of SD. In contrast, Korea and Japan have low development of SD, medium level development of ED and MD, and higher development of RD. If we compare the hypotheses that have gone through the test and the actual data, Korea is the only country with the CEO-related data which are consistent with the original IPS classification. On the other hand, the CEO-related data from China and Japan do not conform to the original IPS classification, i.e., China should belong to LDC, while Japan should belong to DC. Nevertheless, this categorization of the two countries does not meet our expectation of the two economies.

DISCUSSION AND CONCLUSIONS

Conclusions

This research shows that the RD-type CEO will play his due role in DC. But what deserves more attention is that DC has high results in all areas except the SD-type CEO. It means that the MD-type CEO does not take the top position yet, but is in a transitional period from RD to MD-type CEO. In other words, DC needs to improve the business environment where the CEO can fulfill his potential, while CEOs should equip themselves with more reformative leadership and ability to significantly change existing orders. In addition, related regulations should be improved as well. In the era of information, knowledge, sophisticated technology, and globalization, CEO has to realize that they should be able to meet changes and challenges with management strategies, technology development, while handling management-labor relations and the environmental issues. They must see that business goal is not just for profit taking but also for social commitment.

SDC has evenly developed SD, ED, and RD whose development level is still lower than that of DC. Its MD shows less development than other elements. In the future, improvement should be made to back up the business environment and other related factors so that MD-type CEO can play his due role. At the same time, inter-industrial network needs to be established for technology development and cooperation for a balanced industrial development.

DIC has stronger SD-type CEO than other elements. Since it is on a transitional stage from SD to ED-type CEO, it needs the conditions in which ED-type CEO can fulfill his potential: efforts should be made to improve the business environment, to innovate infrastructure and to systematically use physical and human resources for the next step. The challenge is how to sophisticate and develop technologies to meet the consumers' diverse demand and rapid changes.

LDC has a strong SD-type CEO with other elements in considerably lower levels. Government should take a lead for balanced industrial-and-company development rather than comprehensive and all-inclusive efforts. Meanwhile, CEOs should equip themselves with capability to coordinate and develop government policies and companies' strategies.

CEOs of China, Korea, and Japan

Three Northeast Asian countries of China, Korea, and Japan is one of the most economically dynamic regions in the world, and this situation will continue to hold in the 21st century. Japan was the leader in economic growth in the 1950s and 60s, while Korea became the leader in the 60s through 80s. Then China took the leadership role since the 1990s that continued as we entered the 21st century. Over the last 20 years up

until 2000, the Northeast Asian countries recorded 6.8% in an annual economic growth rate, twice the world average of 3.4%. As for trade, North-east Asia accounted for 19.1% in 1986 and 28.6% in 1996, with 32.4% expected in 2010.Therefore, it is imperative that CEOs in East Asia make a conscious effort to lead the world rather than just to follow the trails of advanced countries.

As mentioned before, China, which has just turned into a market-centered economy and has taken a step toward the world economy, still has a lot to improve to enhance CEO's competitiveness. In this regard, new strategies and visions should be made for balanced industrial-and-company development. In addition, efforts should be put to change the government-led economy to the CEO-centered economy, where the CEOs should be able to utilize ED, RD, and MD to their full potential. Korea and Japan should put s, e, and r into a good use to make themselves into DC-type MD, which requires consistent development of new and sophisticated technologies and market-leading CEOs who can meet diverse consumers' demand. It means efforts should be made in a reformative way to create consumers' demand or market itself rather than just following consumers' needs. At the same time, business strategies, technology development, and management-labor relation should be improved.

The research result suggests certain specific kinds of CEO for China, Korea, and Japan, respectively, for seamless progress toward the next stage of economic development in the future. As for China, its biggest challenge is how to nurture ED- and RD-type CEO to move onto SDC. In other words, China needs rational CEOs with solid management skills and techniques. Recently, many Chinese universities have actively started MBA programs. This effort seems to be appropriate as the program can produce rational business professionals in large numbers.

Korea on the other hand, needs MD-type CEOs. However, Korea is less active in nurturing CEOs with professional business education and training. In this regard, what Korea needs is MD-type CEOs who can rationalize and systemize the overall national economy and individual private firms. Japan is not much different from Korea since it also lacks MD-type CEOs. Considering that risk-taking CEOs in Korea's large business groups are on their way to learning the mechanism-based management know-how, Japan should make a gallant effort to transform the attitudes of its CEOs toward more mechanism-based paradigm.

Discussion

This research divided industrial development stages into s, e, r and M and categorized the 9-factor model. It also discusses CEO types, stage-specific CEO styles and other related issues. S, e, r and M are competitiveness elements; specific data is used to get variable for analysis. The research result shows that DIC is still in the SD-type CEO, and that DC also has RD-type CEO wielding this power. However, comparison is

made only in CEO types of individual country groups. In other words, the comparison shows that the order of DC, SDC, DIC, and LDC exists for ED, RD, and MD, except for SD which shows the inverse order. As the analyses suggest, unlike ED, RD, and MD variables, SD variable can hardly be standardized. In standardizing the subject, we used endowed resources and workers among the 9 factors. But, variations among the 9 factors appear different as we test their validity from the IPS NCR2002 data. In addition, the total average is considerably different among the 9 factors. Therefore, more attention should be put in using two out of nine factors to create SD, ED, RD and MD variables.

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