

# **The Polarization of Wealth: The Effect of Support of Knowledge Management on Knowledge Management Activity and Company Performance**

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## **Abstract**

This study attempts to verify effects of CEO' supports, compensation and educational training and those of individual annual salaries and company's sales on promotion of knowledge management expected to contribute to enhancing construction industry's competitiveness, from the perspective of person-organization fit. For the analysis, a total of 368 effective questionnaires were used to conduct independent sample t-test, regression analysis and hierarchical moderated regression analysis. The findings show that individual annual salaries have a positive relationship with company's performance and company's sales also have positive relationships with both knowledge management activities and company performance, and CEO's supports, compensation and educational training are important factors that can improve knowledge management activities. In addition, the principle that the rich get richer and the poor get poorer is also operated in construction industry, as in other industries. Therefore, members in a company should conduct optimal strategies to enhance the knowledge management activities through selection and concentration, while governmental agencies require the establishment of IT system for it and supports for related cost and consulting of it.

**Keywords:** Support of Knowledge Management, Knowledge Management Activity, Company Performance, Salary and Company Sales, P-O Fit.

## **1. Introduction**

Since the end of 2015, increase of uncertainty derived from concerns for decrease of housing transactions and oversupply has put Korean construction industry at risk. Moreover, construction companies are forced to adapt to new management environment, for their survival, due to prolonged domestic sluggish development caused by globalization of construction market and contraction of global economy. To date, decrease of profitability because of

difficult management environment has direct influences on deterioration of management state, and thus, many companies are selected as the objects of work-out or suffer bankruptcy and then disappear in the market.

However, the construction industry, one of main industries which lead Korean economy should pursue 'discovery of new growth engine' and 'innovation of construction industry', for it to overcome recent management crisis and promote sustainable growth. Thus, it should externally open up a new market and seek out a new business, but also internally make various efforts related to general management innovation including cost savings and structural regulation, as well as creation, protection and use of knowledge assets such as basic and original technologies.

In the 21th century, not only development of IT-based information and communication technology, but also emergence of convergent new technologies requires much efforts to secure sustainable competitive advantage by establishing an entry barrier or attacking rivals with knowledge management as a weapon (Lee et al., 2015). Therefore, now is the time for construction industry to need long term vision and orientation for the knowledge management, in order to open up a new market and discover a new business. However, the construction industry has long experienced slower growth, compared to other industries, and over-competition for contract has resulted in zero-sum (Thurow, 2008) and even collapse, so no construction industry dares to consider knowledge-based management. In addition, members' turnover rate in medium-small construction companies in which management environment is usually poor, is high than that in other industries, so individuals cannot acquire opportunities to store their mastered high-tech and experience in the inner part of companies. However, need for knowledge management has been increased, since it is difficult to formalize construction industry and there is a lack of knowledge establishment related to professional knowledge, such as systematic work manuals regarding general and understandable works necessary for performance (Kim, 2006).

This study focuses on supports, compensation and educational training, as factors for promoting knowledge management in construction industry. The reason is that many studies have proved the importance of leaders' roles in management and that the compensation that members recognize in management is suggested as a very important concept. While some scholars have doubted immediate effectiveness of educational training, it is impossible to ignore importance of establishment, transmittance and activity of knowledge in the long term. Therefore, this study attempts to verify importance of the knowledge management by testing effects that such factors have on knowledge management activities and casual ones that knowledge management has on company's performance. Moreover, it tries to examine whether high turnout rate in construction industry is affected by individual salaries, and company's sales is also determined as an important factor which helps examine a difference between large and medium-small company, so it attempts to test effects of both salaries and sales.

From the findings, some factors which are able to promote knowledge management activities are derived, and roles of knowledge management and effects of individual salaries and sales of company are verified, so they are expected to contribute to draw company's strategies by which knowledge management can be stably introduced and operated.

## **2. Literature Review**

### **2.1. Knowledge Management**

Knowledge has been defined by many scholars as justified true belief (Nonaka & Tacheuchi, 1995), realistic making decision, high-valued information (Davenport & Klaha, 1998) and information validated though proof process (Leibeskind, 1996). For the importance of knowledge, Drucker (1993) suggested knowledge as the factor 4 with absolute scarcity value, in addition to three essential factors of traditional production for economic activities: land, labor and capital). He also emphasized that knowledge is more important than other factors, for meaning of knowledge.

For the knowledge management, Penrose (1959) initially introduced knowledge-based perspective for companies, which was confirmed as resource-based one by other researchers (e.g. Barney, 1991) and has been studied (Park et.al, 2013). The knowledge management may be the one which systematically organizationally and individually explores knowledge and accumulates it on inner parts of companies and furthermore uses it for enhancing their competitiveness (Nonaka & Tacheuchi, 1995). Other definitions of the knowledge management conceptualized by other scholars are also examined. The knowledge management is a skill to create a value by using intangible property (Sveiby, 1998). It recognizes the knowledge, a kind of property internalized in individuals and capitalizes it so that it can be used in members' decision makings (Prusak, 1997). It is also an activity that produces a new organizational capacity and elevates performance of members, while promoting innovative actions, formalizing their

experience and knowledge for improving customers' values and allowing more comfortable access to and use of knowledge (Beckmann, 1997).

From this view, the knowledge management for increasing added value by efficiently using knowledge assets of construction companies is an important process for them to secure competitive advantage. How intellectual capital developed and possessed by companies can be turned into values and how to secure competitive advantage by securing, creating, spreading and sharing it are thought as important factors that are directly coupled with survival of construction companies.

## **2.2. Antecedents of Knowledge Management Activities**

This study treats CEO, compensation system and educational training as antecedents of knowledge management activities through creation of value, because the role of CEO is most important for a company's management, and fairness-based compensation system and investment in educational training for work improvement and innovation are determined to be foundations of knowledge management activities. Preliminary studies on antecedents of knowledge management activities are as follows:

First, CEO is a dynamic subject who pursues innovation (Schumpeter, 1934) and a pathfinder who is interested in growth of future and development of technology by focusing on something innovative. Therefore, CEO plays some roles as those of innovator, agent, producer, indicator of direction, mediator, director, facilitator and advisor (Quinn, 1988). The roles of them can have significant effects on promotion of knowledge management activities by members. For example, CEO as an innovator should guide effective making decisions and inner modifications of the organization, in order to encourage members to adapt to changes of organizational environment and induce environmental changes (Mintzberg, 1994; Nanus, 1992), and serve to make his/her organization more competitive by creating mood that stimulates innovation (Javidan, 1991). In addition, CEO as an indicator of direction should play his/her role in overcoming crises and acquiring opportunities by understanding current states, defining problems and articulating the company's goals (Javidan, 1991). CEO as a facilitator should strengthen cohesion of the organization through active management of conflicts among members (Gupta, 1988), bridges the gap between individual values and organizational goals, through empathy and trust, and have a positive effect his/her company by helping individuals grow and develop through emotional instruction and advice (Mintzberg, 1994). Thus, CEO's supports are most likely to have a positive influence on the knowledge management activities.

Second, the compensation, a transaction between organizations and individuals according to a contract of employment may include not only economic but also psychological, social, political and ethical one (Belcher & Atchinson, 1987), has been historically recognized to be necessary for more effective enhancement of performance. In other words, the compensation is the widest concept involving not only a whole of financial and physical pays employees receive from their companies, except for basic wages, but also non-economic factors containing job benefits, all kinds of fringe benefits that employers provide employees: job itself, job environment and promotion (Renold, 1978). The compensation is a very important factor, in that it is a main source of individual's income and the largest cost item in a company, as well as reward for individual's efforts and investment in development of human resource, and has substantially significant effect on satisfactions of members and performance of organizations.

Third, the educational training is a process which helps members achieve organizational goals by nurturing knowledge, skills and abilities necessary for job performance (Mathis & Jackson, 2003). Therefore, the purpose of educational training by companies is to enhance participating workers' knowledge, skills and attitudes. The educational training determines members as human resources, and causality between educational training and performance can be estimated from Human Capital Theory of Becker (1975), a representative one related human resource management and RBV (Resource-Based View) of Barney (1991). The Human Capital Theory assumes that investment in the educational training not only enhances value of workers, a human resource, but also ultimately contributes to increase of production and profit of organizations, and that present investment results in improved future outcomes (Becker, 1975; Sweetland, 1996). In addition, value-creation of inner resources through educational training can provide a source of competitive advantage, since resources and capabilities of companies are important, from resource-based perspective (Barney, 1991). The educational training of companies has recently emerged as an important measure of competitive advantage, because knowledge-based view that recognizes knowledge as an important strategic resource and argues that it should be effectively managed has been highlighted (Barney, 1995; Conner & Prahalad, 1996; Demsetz, 1991; Spender, 1996).

### **2.3. Knowledge Management Activities**

The knowledge management activities, a series of process in which knowledge management is practiced are an innovative process which shows endless mutual circulation by securing, creating, sharing, utilizing knowledge, in order to increase values of organizations (Nonaka et al., 2000). The knowledge management activities are a dynamic process in which members enhance their learning and create new knowledge and understanding by sharing knowledge and information among them and can adapt to changes of consumers' needs and acquire new knowledge and skills by making expressions through knowledge networks within organizations and sharing and using some knowledge which is difficult to transmit as well as tacit know-how (Kim & Shin, 2013). Thus, the core of knowledge management activities is to consider both infrastructure of knowledge management consisting of management factors such as strategy, human beings, organizational culture and structure and process and technology factors related with creation, storage, search and sharing and knowledge management process of acquirement, creation, sharing, use of knowledge (Firestone & Mcelroy, 2004). Since IT-based knowledge management infrastructure in technological sectors has been moderately established for Korean construction companies, how much members make efforts to create, share, use and store knowledge their jobs can be expected to be most likely promoted by management factors.

### **2.4. Performance of Companies**

The performance of companies, an outcome from a series of their activities can be divided into financial one which measures growth in sales, return on investment, and market share and non-financial one involving research and development, development of human resource and job satisfaction of employees. Although the evaluation of companies' performance with financial index is the most general and traditional one, which can be easily analyzed in terms of quantitiveness, it is relatively difficult to acquire information and it is generally suggested that it is not easy to assess intangible intellectual resource with financial index which are focused on quantitiveness (Edvinsson, 1997; Kaplan & Norton, 1992; Malhotra, 1997). In general, the performance of companies regards the performance as achievement of a goal at the same level of companies' effectiveness (Rainey, 1997; Jreisat, 1997; Szilagyi & Wallace, 1990) or as higher level of concept related with performance (Rogers, 1990). In addition, various studies have showed that there are strong correlations between objective and subjective evaluations, so former (Dess, 1987) and latter (Greenley, 1995; Hart & Diamantopoulos, 1993; Jaworski & Kohli, 1993) are simultaneously used. Meanwhile, Jaworski & Kohli(1993) argued that subjective evaluation can more effectively measure the concept of performance, than does objective one.

## **3. Methodology**

### **3.1. Research Model & Hypotheses**

This study aimed to examine effects of some management factors (CEO, compensation and educational training) for activation of construction industry's knowledge management on knowledge management activities. Moreover, it also attempted to investigate whether individual annual salaries contributed high ratio of turnout specific to construction industry test effects of companies' size of sales, which was determined as an important factor for identifying differences between large and medium-small companies. This study supposed that members' annual salaries(wages) and size of companies have substantial effects on knowledge management activities, since the wages, realistic compensation which is provided as the cost of individual labors are reward for employees' services, which consists of money, fringe benefit and financial value with which companies give them (Lawler, 1971) and is likely to motivate them to willingly contribute development of companies, and the size of companies can be a standard with which how well fundamental infrastructure is established can be compared. Thus, it suggests that the phenomenon that the rich get richer and the poor get poorer can occur even in construction industry as in other industries. Hence, following hypotheses can be established.

Hypothesis 1: Knowledge management activities and performance may be varied according to individual annual salaries and size of companies. More specifically, high annual salaries and large companies would show better knowledge management activities and performance than relatively low annual salaries and small companies.

The knowledge management is the one that systematically discovers, accumulates and use knowledge in terms of individuals and organizations (Nonaka & Tacheuchi, 1995). Since knowledge management activities are endlessly mutual circulating innovative process through security, creation, sharing and use of knowledge for enhancing organizational values (Nonaka et al., 2000), CEO's supports, compensation and educational training may have substantial effects on members' knowledge management activities, as suggested by preliminary studies. This can be interpreted as the person-organization fit. For the person-organization fit in companies, suggested by Chatman (1989) and O'reilly et al. (1991), Kristof (1996) demonstrated that when organizational characteristics satisfy with individual preference and vice versa, when both share similar characteristics, and when two cases simultaneously occur, the fit has a positive effect on performance. Therefore, if CEOs' interests in and supports for the knowledge management, compensation from it and educational training that helps to perform knowledge management activities have positive effects on individual knowledge management activities, the fit can be secured. In addition, robust knowledge management activities of members can naturally promote companies' performance. Thus, following hypotheses can be established.

Hypothesis 2: CEOs' supports for knowledge management would have a positive effect on members' knowledge management activities.

Hypothesis 3: Companies' compensation system for knowledge management process would have a positive effect on members' knowledge management activities.

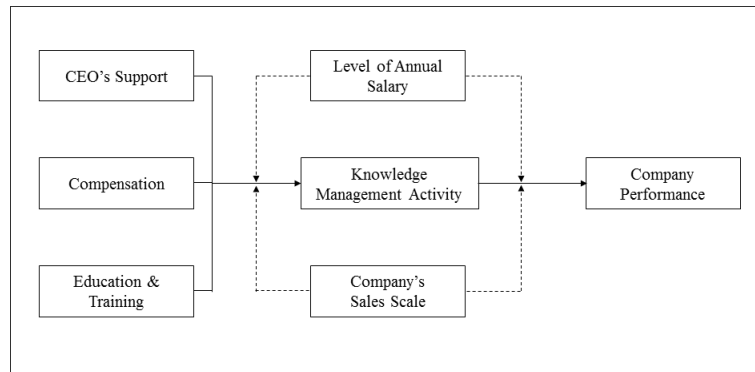
Hypothesis 4: Educational training regarding knowledge management would have a positive effect on members' knowledge management activities.

Hypothesis 5: Members' knowledge management activities would have a positive effect on performance of companies.

As mentioned above, knowledge management infrastructure including management factors such as strategy, human being, organizational culture, organizational structure and process and technological ones involving creation, store, search and sharing of knowledge and knowledge management process in which knowledge is acquired, created, shared and used should be considered when investment is implemented in order to allow companies to practice active knowledge management (Firestone & Mcelroy, 2004). Therefore, the person-environment fit proposed by Kristof (1996) must be prioritized, and it also should be secured in organizations. In this context, individual annual salaries are likely to affect the relationship between and members' knowledge management activities and antecedents of knowledge management activities, such as CEO, compensation and educational training, and the relationship between the activities and companies' performance. Moreover, the size of companies may represent difference in capabilities that companies can provide: competitiveness of medium-small companies is relatively lower than that of large ones. From this view, the size of companies is likely to affect relationship between members' knowledge management activities and antecedents of knowledge management activities, such as CEO, compensation and educational training, and the relationship between the activities and companies' performance. Thus, following hypotheses can be established.

Hypothesis 6: The relationship between antecedents of knowledge management activities and knowledge management activities and that between the activities and performance of companies can be respectively moderated by individual annual salaries and size of companies. More specifically, the higher the individual annual salaries, the larger the size of companies and the better the knowledge management activities and performance of companies.

The study model containing hypotheses above are shown in <Figure 1>.



**Figure 1:** Research Model

### 3.2. Sampling and Measurement

As data for this study, a total of 368 effective questionnaires that Jeong Giyeong (2016) distributed to executives in construction companies enrolled in Korea Construction Association were used by receiving approval of the researcher. CEO's support, Compensation, and Education & Training was measured each 4 item, Likert 7-scale based on Amabile (1988) and Kim (2001). Knowledge management activity was measured 12-item, Likert 7-scale based on Alavi & Leidner(2001) and Gold et al.(2001). Company performance was measured 12 item, Likert 7-scale based on Malhotra (1997) and Jung & Park (2007).

## 4. Empirical Analysis

### 4.1. Demographic Characteristics

Respondents included 319 males (86.7%) and 49 females (13.3%). The number of respondents younger than 40 years old was 123(33.4%) and the number of those in their 40s (41-50) was 104(28.3%). The individual annual salaries which were expected to have moderating effects in this study were divided into two group, on the basis of 50 million won: 207(56.3%), over 50 million won; 161(43.8%), under 50 million won. The size of companies was also divided: 188(51.1%), less than 500 billion won; 180(48.9%), more than 500 billion won.

### 4.2. Reliability and Validity

A confirmatory factor analysis for verifying reliability and validity was conducted to show that conceptual reliability was 0.810~0.949 and AVE was 0.517~0.640. In addition, a reliability test to verify inner consistency exhibited that Cronbach's  $\alpha$  was 0.882~0.963.

**Table 1:** Reliability & Validity

Variables	item	Cronbach's $\alpha$	Construct Reliability	AVE
CEO's Support	4	0.882	0.831	0.554
Compensation	4	0.921	0.876	0.640
Education & Training	4	0.886	0.810	0.517
Knowledge Management Activity	12	0.957	0.949	0.611
Company Performance	12	0.963	0.938	0.560

The results of analysis on correlations are shown in <Fig 2>. The correlation coefficient of compensation and educational training was more than 0.7, indicating multicollinearity, so multiple regression analysis was conducted to show that Durbin-Watson coefficient was 1.658, Tolerance was 0.467~0.766 and VIF was 1.306~2.143 by inputting all independent variables after selecting the knowledge management activities as a dependent one, then it could be determined that autocorrelation or multicollinearity which could not occur because VIF was less than 10.

**Table 2:** Results of Correlation Analysis(n=300)

	1	2	3	4	5	6	7
1. Salary_dummy	-						
2. Sales_dummy	.249**	-					
3. CEO's Support	-.083	-.232**	(0.554)				
4. Compensation	-.068	-.226**	.459**	(0.640)			
5. Education & Training	-.077	-.194**	.435**	.711**	(0.517)		
6. K.M.A	-.068	-.231**	.394**	.639**	.618**	(0.611)	
7. Company Performance	-.136**	-.173**	.346**	.412**	.334**	.523**	(0.560)
Mean	0.43	0.51	4.82	4.26	4.25	4.36	4.43
Standard Deviation	0.49	0.50	1.08	1.15	1.16	1.11	1.12

Note) \*\* p<.01, AVE is made in ( ), K.M.A means Knowledge Management Activity, Salary\_dummy was coded as 1, less than 50 million won and 0, more than 50 million won; Sales dummy was coded 1, less than 500 billion won and 0, more than 500 billion won.

### 4.3. Hypotheses testing

In order to test <hypothesis 1>, independent sample t-test was conducted to exhibit that knowledge management activities by level of annual salaries was not statically significant, while performance of companies was statistically significant. However, knowledge management activities and performance of larger companies were statistically more significant than those of smaller ones. Thus, the <hypothesis 1> was partially adopted.

**Table 3:** Results of Independent t-test

	Group	Mean	Standard Deviation	Mean Difference	t-value	p
Knowledge Management Activity	Salary Low	4.27	1.17	-0.151	-1.283	.200
	Salary High	4.42	1.05			
Company Performance	Salary Low	4.26	1.16	-0.307	-2.628	.010
	Salary High	4.57	1.07			
Knowledge Management Activity	Sales Low	4.11	1.10	-0.512	-4.550	.000
	Sales High	4.62	1.05			
Company Performance	Sales Low	4.26	1.05	-0.388	-3.355	.001
	Sales High	4.63	1.16			

In order to test hypothesis 2, 3 and 4, a regression analysis was conducted to show that CEOs' supports ( $\beta=.360$ ,  $p<.01$ ), compensation ( $\beta=.619$ ,  $p<.01$ ) and educational training ( $\beta=.595$ ,  $p<.01$ ) have statistically significant and positive effect on knowledge management activities by controlling annual salaries and size of companies. Therefore, the hypothesis 2, 3 and 4 were adopted. In order to verify what factors among antecedents of knowledge management activities have more effects on knowledge management activities, a multiple regression analysis was conducted to show that compensation ( $\beta=.370$ ,  $p<.01$ ) and educational training ( $\beta=.309$ ,  $p<.01$ ) have statistically

significant and positive effects on them, while CEOs' supports ( $\beta=.074$ ,  $p=.093$ ) were not statistically significant. Knowledge management activities have statistically significant and positive effect on company performance. Therefore, hypothesis 5 was adopted, too.

From a hierarchical moderated regression analysis which constitutes the interaction term with dummy variable of size of sales, to test moderating effect of personal salary, it was found that CEO's support \* salary dummy ( $\beta=.254$ ,  $p=.245$ ), compensation \* salary dummy ( $\beta=.274$ ,  $p=.075$ ), and education & training \* salary dummy ( $\beta=-.018$ ,  $p=.908$ ) had not statistically significant, respectively. From a hierarchical moderated regression analysis which constitutes the interaction term with dummy variable of size of sales, to test moderating effect of companies' sales, it was found that CEOs' supports \* size of sales dummy ( $\beta=.181$ ,  $p=.426$ ) and compensation\*size of sales dummy ( $\beta=.051$ ,  $p=.739$ ) had no statistically significant interactive effects, while only educational training\* size of sales dummy ( $\beta= -.311$ ,  $p=.048$ ) had statistically significant and negative effects. Therefore, hypothesis 6 was partially adopted.

## 5. Empirical Analysis

This study aimed to verify effects of CEO, compensation and educational training, as factors for activation of the knowledge management which was expected to contribute to enhancement of construction industry's competitiveness and effects of individual annual salaries and companies' sales on knowledge management activities and performance of companies. This was because when antecedents of knowledge management activities of companies and individual knowledge management activities were well achieved from the perspective of person-organization fit (Chatman, 1989; Kristof, 1996; O'reilly et al., 1991), Korean construction industry was expected to secure competitiveness in this era of global competition. From the analysis, following conclusions and suggestions could be found.

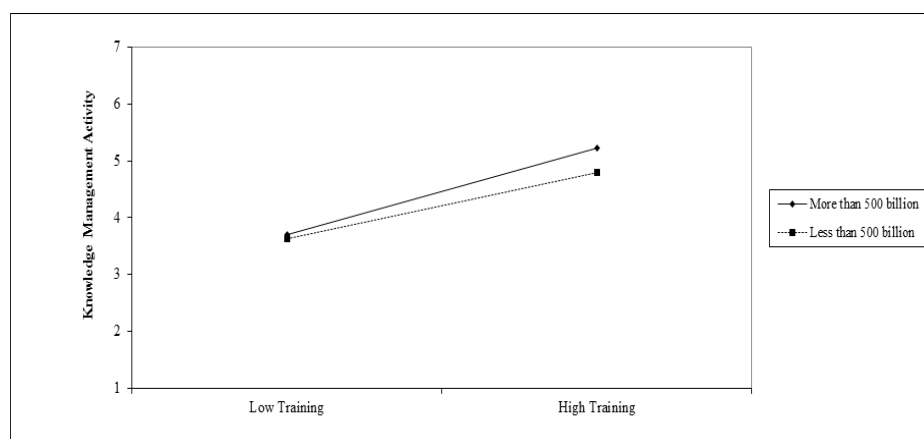
First, although there was no difference in knowledge management activities by individual annual salaries, companies' performance of one group with higher annual salaries was statistically significantly higher than that of other group with lower annual salaries. However, a comparison of knowledge management activities and performance of companies by companies' sales showed that those of companies with higher sales were statistically significantly higher than those of others with lower ones, indicating that substantial efforts are required for medium-small companies to overcome such a challenge. Thus, since not only individual supports, but also companies' system and supports should be provided in advance, to enhance knowledge management activities and companies' performance, medium-small companies must perform most effective strategies through 'selection and concentration'.

Second, it could be found that CEOs' supports, compensation and educational training are all important factors for actively performing knowledge management activities. The multiple regression analysis showed that compensation was most effective, followed by educational training, suggesting that enhancement of educational training which can support knowledge management activities and related incentives would be necessary.

Third, knowledge management activities were found to have a significant influence on the performance of companies. Such a finding means that systems and supports for knowledge management activities are required for Korean construction industry secure competitive advantage in the era of global competitiveness and individuals' energetic knowledge management activities are also necessary, as initially suggested by this study.

Fourth, sales of companies were found to have effects on knowledge management activities through interactions with educational training. Such a result should be interpreted in the same vein as the first finding that the sales affect knowledge management activities and performance of companies. Although companies with lower sales more intensively conduct educational training than does companies with higher sales, as shown in <Figure 2>, the former's level of knowledge management activities was not higher than that of the latter, suggesting that the principle that the rich get richer and the poor get poorer is also applied to the construction industry. Thus, not only maximization of effectiveness through companies' 'selection and concentration', but also active support measures provided by governmental agencies such as Small Business Administration are required to reinforce competitiveness of Korean medium-small construction industry. In particular, more effective knowledge management can be achieved by simultaneously promoting both systematic and management structure, and supports for costs involving the establishment of dual systems and consulting for knowledge management activity supports may be very effectively conducted, if they are provided through governmental fund.





**Figure 2:** Moderation effect of Sales Volume

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