THE EFFECTS OF KOREAN GOVERNMENT'S DEFENSE INDUSTRY FOSTERING POLICY ON THE PERFORMANCE OF DEFENSE INDUSTRY ENTERPRISES

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ABSTRACT. In the year of 2008, a newly launched Korean government has chosen ‘promoting defense industry as a new economic growth’ among one of the national agenda. It is believed to be a strategic governmental plan to achieve more robust national economic and industrial infrastructure as well as armed forces with cutting edge technology via promoting defense industry while sustaining constant economic growth. In this context, this paper is to analyze the factors affected on Korean defense industry development from the 1980s to current government's 'defense industry fostering policy' and then to evaluate the effectiveness and validity of specific defense industry fostering policies. It will also provide some appropriate alternatives that must be conducted from government and other related organizations for future development of Korean defense industry enterprises.

INTRODUCTION

The meaning of 'Acquisition' is used to describe an action or status for securing or possessing an item. In private companies, terms such as procurement, logistics or buy are more frequently used nowadays. Therefore in order to clarify the usage of ‘Acquisition’ in defense sector, it would further be appropriate to utilize the term 'Defense Acquisition'. With this perspective, Defense Acquisition is to describe all activities required by the military from selecting equipments and commodities to supplying those final products. Basically, it means a procurement process of defense products purchased or self-manufactured by research development.

At the same level, if we define the term ‘Procurement’, as a boost in economic activity supplying equipments, materials, products, facilities or services within required time and place, ‘Defense Procurement’ can be described as an act of supplying equipments,

materials, products, facilities or services required by the military. The purpose of defense procurement can be summarized with ‘5R’. It consists of right time, right quantity, right quality, right source and right price. Also the role of defense procurement can offer 4 other benefits which include fulfilling requirements from military, creating profit (with reasonable usage of budget), supplementing other functions of military demands, and sustaining economical inventory level.

Defense procurement market consists of government as consumer and business entity (defense industry enterprises) as supplier. The relationship between the two is not similar to a regular free competitive market but exists close mutual tie between exclusive consumer which is the government and sometimes exclusive supplier which is the business entity. Apart from contracting for fuel, ration, clothing, regular vehicle and other equipment which are from free competition, the defense procurement market has few of its characteristics (Reppy, 1983; Sandler & Hartley, 1995). First, the market price is not set by supply and demand but with defense budgets and company's cost of occurrence. The government has responsibility of acquiring an expected quantity of product within the limited budget and has its limitation to obtain diverse production cost data. The company also tries to cope compensating cost occurred with the purpose of creating a profit. Second, there is a limited production quantity where government being the solely consumer in this market. Therefore, excess production capabilities, idle facilities, and additional fixed costs can be occurred when the volume of required products is changed. Third, due to limited number of suppliers, there is a mutual monopoly between the government and suppliers. Fourth, there is greater emphasis on quality and performance of a product meaning a greater emphasis on national security factor over economic factor. Firth, research development in defense industry tends to have an enormous budget and timeframe with greater uncertainty compared with private industry. Therefore it has higher proportion for the research development.

Defense industry is one of typical G2B (government to Business) process where the government being the solely consumer creating a demand exclusive market. Thus government's defense industry fostering policy has a very important meaning. Especially, Korean defense industry was developed via government's plan, adjustment and control process from its fetal stage. The development process of defense industry has always been proportionate to precedent government's level of support and policy. DAPA (Defense Acquisition Program Administration) was inaugurated in 2006 as a government agency overseeing improvement of defense programs, procurement of defense supplies and promotion of defense industry.

The purpose of its establishment was to overcome national mistrust for defense industry practice by enhancing transparency while offering reduction of budget, utmost administrative service and excellent equipments in timely manner to the people, company and military respectively.[1]

In the year of 2008, a newly launched government has chosen 'promoting defense industry as a new economic growth' among one of national agenda. It is due to a recent reevaluation of the defense industry's impact and value on Korean economy as well as Korea's defense exports being soared from an average of $200M level over the past to $850M in 2007. Current government is recognizing the defense industry as a security asset from the initial stage of construction for Korea's industry infrastructure and is reevaluating its spill over effect in other industries with its high end technology.

There have been numerous research on developing Korean defense industry. However, various precedent research have analyzed focusing solely on individual case which often lack feasibility. We can find similar evidence on many of previous research on the factors affecting development of Korean defense industry in order to nurture the industry as one of government's policy. The emphasis on different factors and the measurement variables used to determine those factors differ within numerous researchers. Only few limited factors are used for the analysis in most part. Therefore my research is to consider government's defense industry nurture policy which is derived from the process of BASIC PLAN TO REFORM NATIONAL DEFENSE with the perspective of ‘promoting defense industry as a new economic growth’ level.

The purpose of this paper is as follows. First is to verify what factors have caused our defense industry promoting policy from the beginning of 1980 to the present along with how the factors will affect in the future. Second is to evaluate the effectiveness and appropriateness of various specific defense industry promoting policy that the government has been implementing over the past years. Third is to suggest an appropriate alternative plan for government and related officials in order to improve Korea's future defense industry.

METHODS

Previously mentioned ‘promoting defense industry as a new economic growth’ for Korean government policy can be more persuasive in this current global economic crisis. In other words, to overcome the domestic critics for maintaining an inefficient defense/technology infrastructure which has too much to bear on its

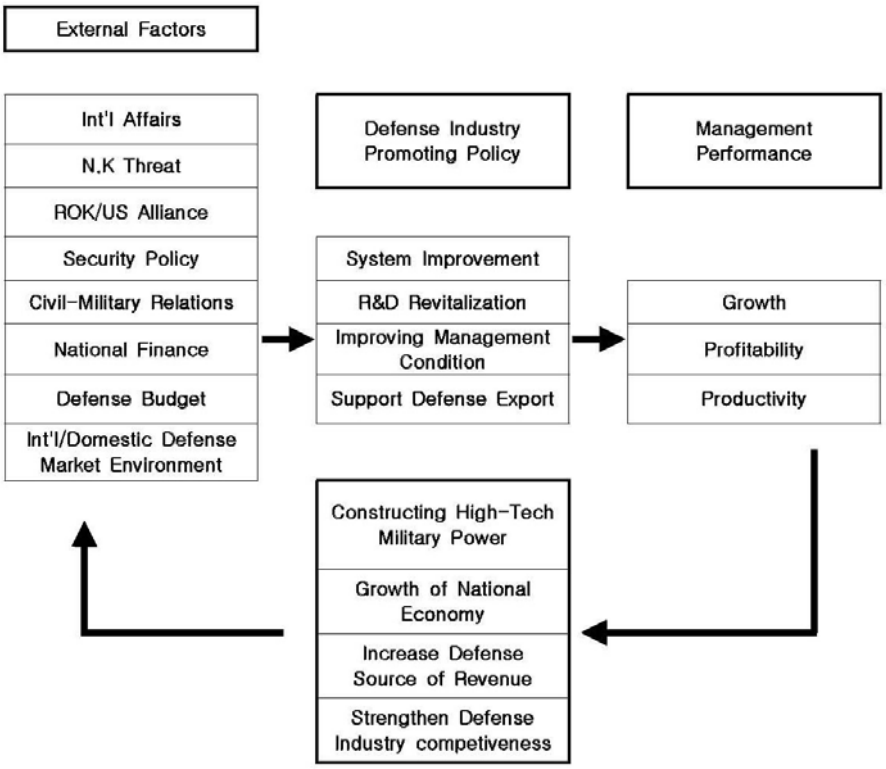
cost incurrence, there has been a new recognition for defense industry's domestic and overseas economic impact. This is based on the fact that government is an exclusive buyer unlike other private enterprises.

Korean defense industry which has been developed from government's active and direct protective/promoting policy from its initial stage is now facing numerous problems as shown in recent management performance of defense enterprises. Domestic defense industry had constant up and downs whenever a new administration introduces different goals and expectations for force augmentation and its policy on the defense industry. However, the first evaluation criteria to measure the development of defense industry are the management performance of defense enterprises. Due to its nature of the defense industry, the influence of government being a solely customer is critical. This means that the management result of Korean defense enterprises react much more susceptible to any other private industries in relation to government's direction of defense industry promoting policy and its specific contents. The following figure 1 shows Korean defense industry development model.

As shown in FIGURE 1 below, this study has created Korean defense industry development model on dimension of government's defense industry promoting policy. This is based on the assessment that the management performance among defense enterprises is directly linked to the effectiveness of government's defense industry promoting policy. This model is to regulate the perspective and direction of this study. Thus, this paper is to compose a conceptual framework to describe the development of Korean defense industry in a macroscopic perspective while focusing on government's defense industry promoting policy and to use this framework to lead a thorough discussion.

FIGURE 1

Korean Defense Industry Development Model



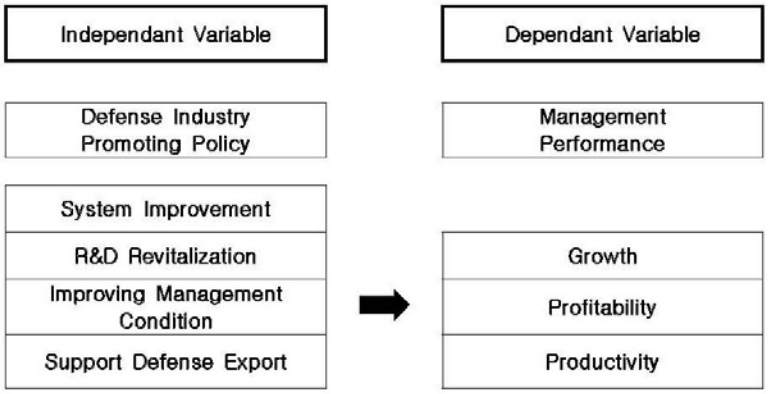
Company's impact on management performance factors in empirical work to identify and support the efficient operation of the business about how the company can provide the direction and cause-related organizations interested in research is very meaningful. Therefore, active researches by many researchers have been made. However the researches on defense enterprises (companies) which have distinguished characteristics from the private ones have not been made yet. Most existing studies of the defense industries rely on private sector which makes insufficient factors to determine management and factors impacting defense enterprise. Therefore there is a need for a change of research on defense industry in order to reflect its own characteristics of defense enterprise which is different from the private one.

As indicated in the introduction, the first objective of this paper since the early 1980s so far accumulated in past South Korea's defense industry as business analysis based on the government's defense industry promotion policy and its impact on the management

performance of defense industry, is to look at its impact relationship. Therefore, I composed a model demonstrating factors affecting management performance of defense enterprise as shown in FIGURE 2 via reviewing precedent research.

FIGURE 2

Research Model



The research model is composed of four independent variables and dependant variables which include growth, profitability and productivity level. The independent variables appear constantly in the past government's defense industry promotion policy, especially in incumbent government's BASIC PLAN FOR DEFENSE INDUSTRY PROMOTION (2008-2012) where four areas have been selected among one of four major policy issues. Growth, profitability, productivity, Korea Defense Industry Association (KDIA) in the defense industry management and business analysis of sales metrics, sales profits, and value added rate per employee, including one that appears to amount to objective performance indicators was used. Management performance measure index from KDIA was utilized for the dependant variables which reflect the actual costs such sales metrics, sales profits, and value added rate per employee.[2]

This research study is divided into three broad themes. First is to verify the research model for entire defense industry enterprises' management performance. Second is to verify the research model for defense industry enterprises' management performance within each business category and third is to confirm the difference of each category of business by the result of government's defense industry promotion policy. Therefore the research hypotheses is composed of three parts; Hypothesis 1-4 being the relationship between defense

industry promotion policy and entire defense industry enterprises' management performance, hypothesis 5 being the relationship between defense industry promotion policy and management performance among each business category and hypothesis 6 being the relationship between the characteristics of defense industry enterprises and its management performance. The detailed are as follows.

Hypothesis for the Relationship between Defense Industry Promotion Policy and Entire Defense Industry Enterprises' Management Performance

This hypothesis consists of relationship between each independent variables and dependant variables in the research model. Hypothesis 1 is the relationship between system improvement policy and management performance of defense industry enterprises. Hypothesis 2 is the relationship between R&D revitalization policy and management performance and hypothesis 3 is the relationship between management condition improvement policy and management performance. Hypothesis 4 is the relationship between defense export support policy and management performance.

• Hypothesis 1: System improvement policy will have impact on management performance.

H 1a. Changing number of designated business enterprise will have impact on management performance.
H 1b. Changing number of designated defense materials will have impact on management performance.

• Hypothesis 2: R&D revitalization policy will have impact on management performance.

H 2a. Changing the amount of investment in research development will have impact on management performance.
H 2b. Changing the rate of localization will have impact on management performance.
H 2c. Changing the amount of the offset cost will have impact on management performance.

• Hypothesis 3: Management condition improvement policy will have impact on management performance.

H 3a. Changing the amount of defense improvement budget among the national defense budget will have impact on management performance.
H 3b. Changing the import from overseas cost among the defense improvement budget will have impact on management performance.

H 3c. Changing the amount of newly invested facility cost will have impact on management performance.

H 3d. Changing the amount of support fund for defense industry promotion will have impact on management performance.

- Hypothesis 4: Defense export support policy will have impact on management performance.

H 4a. Changing the amount of defense export will have impact on management performance.

H 4b. Changing the amount of the offset cost will have impact on management performance.

Hypothesis for the Relationship between Defense Industry Promotion Policy and Management Performance of Defense Enterprise within Each Business Category

This hypothesis is to verify the research model with each business category of defense enterprise composing the relation between independent and dependant variable as of hypothesis 1-4. The categorization of the business was applied using KDIA standard, dividing into 8 categories; aviation, firepower, ammunition, maneuver, communication/electronic, warship, CBR and others. The following four independent variables have selected their own measuring variables. The system improvement sector selected change in number of designated defense enterprise as its measuring variables. R&D revitalization sector selected change in rate of localization. Improving management environment sector selected change in newly invested facility cost. Defense export support sector selected change in amount of export for defense. Actually, we see an insufficient statistical data to verify the hypothesis. This is due to limitation on closed access to defense area which lead to only providing government nominated defense enterprise's performance result. Therefore only limited measuring variables were used for this research.

- Hypothesis 5: Defense industry promotion policy within each sector of business will have relations to each sector of business' management performance.

H 5a. Change in number of designated defense enterprise will have relations to management performance.

H 5b. Change in rate of localization will have relations to management performance.

H 5c. Change in newly invested facility cost will have relations to management performance.

H 5d. Change in the amount of export will have relations to management performance.

Hypothesis for the Relationship between Characteristics of Defense Enterprise and Management Performance of Defense Enterprise within Each Business Category

This hypothesis is to verify the difference among 8 business sectors' management performance as the result of defense industry promotion policy. Therefore 8 sectors of defense enterprise are chosen as independent variable where as growth, profitability and productivity level are chosen as dependant variable which the performance result of those 8 sectors.

- Hypothesis 6: Difference in management performance exists depending on the characteristics of defense enterprise.

H 6a. Difference in growth level exists depending on the characteristics of defense enterprise.
H 6b. Difference in profitability level exists depending on the characteristics of defense enterprise.
H 6c. Difference in productivity level exists depending on the characteristics of defense enterprise.

Operational Definition of Research Variables

The variables used in this study are largely divided into three categories in accordance to the research topics. TABLE 1, TABLE 2, TABLE 3 consist of research variables and operational definition used in each research topic.

TABLE 1

The Relationship between Defense Industry Promotion Policy and Entire Defense Industry Enterprises' Management Performance

Research Variables		Operational Definition (Index)
System Improvement	Designated Defense Enterprise	Number of Designated Defense Enterprise per Year
	Designated Defense Material	Number of Designated Defense Material per Year
R&D Revitalization	Research Development Cost	Invested Amount of Research Development per Year
	Localization	Rate of Localization per Year
	Offset Program	Amount of Offset Cost per Year
Improving Management Condition	Defense Improvement Cost	Amount of Defense Improvement Budget per Year
	Import from Overseas Cost	Amount of Import from Overseas Cost per Year
	Newly Invested Facility	Amount of Newly Invested Facility per Year
	Policy Fundl Support	Amount of Support Fund for Defense Industry Promotion per Year
Support Defense Export	Export Performance	Amount of Defense Export per Year
	Offset Program	Amount of Offset Cost per Year
Management Performance	Growth	Amount of Sales per Year
	Profitability	Amount of Operating Profit per Year
	Productivity	Amount of Value Added Rate per Employee per Year

TABLE 2

The Relationship between Defense Industry Promotion Policy and Management Performance of Defense Enterprise within Each Business Category

Research Variables		Operational Definition (Index)
System Improvement	Designated Defense Enterprise	Number of Designated Defense Enterprise per Year
R&D Revitalization	Localization	Rate of Localization per Year
Improving Management Condition	Newly Invested Facility	Amount of Newly Invested Facility per Year
Support Defense Export	Export Performance	Amount of Defense Export per Year
Management Performance	Growth	Amount of Sales per Year
	Profitability	Amount of Operating Profit per Year
	Productivity	Amount of Value Added Rate per Employee per Year

TABLE 3

The Relationship between Characteristics of Defense Enterprise and Management Performance of Defense Enterprise within Each Business Category

Research Variables		Operational Definition (Index)
Characteristics of Defense Enterprise	8 Sectors	aviation, firepower, ammunition, maneuver, communications, warship, CBR, others
Management Performance	Growth	Amount of Sales per Year
	Profitability	Amount of Operating Profit per Year
	Productivity	Amount of Value Added Rate per Employee per Year

Analysis Method

The existing precedent researches in regards to company's management performance have been conducted via surveys in most part. However, the statistical data for analysis in this research compose of DAPA statistical data, Ministry of National Defense yearly publication and Korea defense research institute's KBDS.[3]

For authentic analysis purpose, SPSS 12.0k for windows was used. For hypothesis 1-4 (relationship between defense industry promotion policy and entire defense industry enterprises' management performance), multiple regression analysis was conducted to analyze the effect of independent variable of each sector on the entire defense industry enterprises' management performance. To increase regression model's goodness of fit (adjusted R^2), Backward Elimination Model was used. For eliminating standard of independent variables, significance probability $p>0.1$ was selected. Multicollinearity was not detected. For hypothesis 5 (relationship between defense industry promotion policy and management performance of defense enterprise within each business category), Spearman's rank correlation method, part of non-parametric test method, was used to identify the existence of correlation between the each factor of independent variable and management performance of the enterprise and to measure its extent. For hypothesis 6 (relationship between characteristics of defense enterprise and management performance of defense enterprise within each business category), Kruskal-Wallis one-way ANOVA method was used which verify the difference among two or above average between non-parametric methods.

RESULTS

The Relationship between Defense Industry Promotion Policy and Entire Defense Industry Enterprises' Management Performance

TABLE 4 shows the statistical hypothesis test results for established hypothesis 1-4 in regard of relationship between defense industry promotion policy and entire defense industry enterprises' management performance. The relevant hypothesis is selected if more than one category is affecting the performance variables (Growth, Profitability, Productivity). 7 hypotheses were selected out of 11. Using statistically reliable and official data from 1981 to 2007, I have set the significance level (P) of 0.1 from the multiple regression analysis result. The following shows the effects and the relationship.

TABLE 4

Hypothesis Test Results (Hypothesis 1-4)

Category		Hypothesis	Test Result	Standardized Coefficients		
				Growth	Profitability	Productivity
Defense Industry Promotion Policy	System Improvement	Designated Defense Enterprise	Selected	.252**		
		Designated Defense Material	Selected	.847**	.449**	.467**
	R&D Revitalization	Research Development Cost	Selected	.834**	.436**	.605**
		Localization	Selected	.239**		
		Offset Program	Rejected			
	Improving Management Condition	Defense Improvement Cost	Selected	.938**		.580**
		Import from Overseas Cost	Selected		.388**	
		Newly Invested Facility	Rejected			
		Policy Capital Support	Rejected			
	Support Defense Export	Export Performance	Selected	.625**	.390*	.339*
		Offset Program	Rejected			

*

p<0.1, ** p<0.05

For system improvement area, the number of designated enterprise has positive effect on growth, but no other effects on profitability and productivity level. The number of designated defense materials has positive effect on growth, profitability and productivity level.

This result has an implication to current defense enterprise and material designation system. Up to today, government's policy of selectively managing designated defense enterprise/materials had a positive effect on performance result of the company and it would be vital to minimize any side effects while emphasizing its positive effects in order to improve current system. It allows the company to proceed with a private contract after being designated by the government which makes them government's first priority enterprise in accordance with DAPA regulation and therefore have benefits such being applied to submit defense production cost. We see a direct implication of the system to company's management performance result. However, effort to minimize any side effects must be done. The company tends to only focus on having designation by the government which enables them to have an exclusive status from the initial research development stage. This can lead to lack of competition spirit, effort to improve the performance itself, and effort to reducing production cost and others. In conclusion, in order to acquire stabilized procurement sources and to assure quality assurance system, it is needed to institutionalize regulations to

specify designating and managing standard of defense enterprise/material in this fast evolving environment while minimizing harmful effect of its exclusivity status and to consider localizing defense materials at a periodic pace.

For revitalization of R&D sector, the amount of investment for research development have all positive effects on growth, profitability and productivity level while rate of localization has its effects on growth. However, the amount of offset cost does not have any effect on management performance result.

The amount of investment for research development is having positive impact for government's sustaining defense R&D investment rise. However it is hard to interpret the fact that investment on research development had a direct link with rise in rate of localization and substitution of import. The investment was directly used for supporting basic research cost, labor cost which is needed to establish an infrastructure for production and development of civil-military dual use technology and those positive efforts were reflected on annual company's balance sheet. The investment amount tends to be a continuous cost over a long period of time. Therefore the cause for effectiveness of investment amount must be found elsewhere such as rising rate of localization.

Change in rate of localization is linked to rise in sales volume of localized high-tech weapons system which has substituted imported systems from overseas in the past. However the fact this effort is not having any change in profitability and productivity level suggest there must be more inputs from company with enhanced management policy and facility. Therefore the government must take actions to sustain systematical localization plan and to enforce evaluation and compensation system for local companies with localization work.

Before 1990s, the government preceded the offset program with promoting government recommended export products rather than defense materials therefore there was no effect on the management performance of defense enterprise. Also after 1990s the offset program was preceded mainly with acquiring technology which made it hard to numerate in dollar amount. Current result of offset program is insufficient compared to its actual performance. The problem lies on its closed management and performance focused culture of the offset program. Therefore along with system improvement, the technical data acquired from offset program must be easily accessible to defense related organization and other enterprise. Also current 30% application rate of offset program must be further increased. Lastly despite small and medium sized enterprises are establishing their grounds for developing and producing weapons systems, there

are lack of support on the offset area thus government driven efforts and policy must be in place.

For improving management performance condition sector, defense improvement cost has positive effect on growth and productivity level and import from overseas cost on profitability level. However, the amount of newly invested facility and policy fund support had no impact on the performance part. This has a lot of implications.

Defense improvement fee has contributed to some external factors such as sales volume of defense enterprise and value added rate per an employee but excessive government regulation and passive management culture of defense enterprise lead to failure in generating a profit. Import from overseas cost had a positive impact on profitability level. Initially, a presumption was made that domestic defense enterprise markets would shrink by importing more overseas materials. However, the positive impact of import overseas materials contributed to domestic company's certain profitability levels which include incorporating main parts from domestic company, system integration, and manufacture by introducing of technology, maintenance and others.

The fact that the amount of newly invested facility does not affect performance result shows the investment over the past 30 years was fairly inefficient. Most of investment was focused on construction work (35%) and land (33%) which was hard to reflect on the performance factor. Therefore rationalizing defense facilities are urgent. In general rationalizing defense facilities would be more appropriate to leave this portion to the free market but due to its own characteristics of defense industry, government intervention for defense facilities would be more legitimate. Current system where excess amount over production capability is being compensated remains to be the problem. Therefore an effort to generate a new value added on facility investment cost is required.

Support fund for defense industry promotion being ineffective to performance result was driven from the fact that the total loan required for defense enterprise from 1980 to 2006 was roughly 2.4 billion dollars but the actual loan amount was 550 million dollars which only accounted for 23% of total required. As defense industry require sustainable heavy some of facility investment, this fact poses a problem to the industry. The subject of defense industry promotion fund support has 9 different sectors by the regulation but only 4 of the sectors are being used disregarding the remaining 5 sectors. This fund was mainly used for conducting research development and localization effort, acquiring raw material and sustaining idle facility and that there was no clear distinction between research development and localization fund. There were a lot of deferred loan due to change

in plan for a long period of time. In summary, unutilized loan regarding operating and export support fund caused in insufficiency on the defense industry promotion fund support problem. Therefore the fund support did not show any effect on the performance result of defense enterprise.

For defense export support sector, net export had a positive effect on the performance result in general but the amount of offset cost did not have any effect on the performance result.

There has been a steady increase of defense export performance over the past 30 years driving the net export value having positive impact on the performance level. So we can say that expanding from limited domestic sales to gravitating towards export driven sales would be an absolute action for defense enterprise in order to improve their performance result. Thus we have to overcome current defense system being only dependant to domestic military itinerary and to further increase defense export volumes via firm export oriented policy by the government. The focus needs to be in the area of enforcing export revitalization policy driven from the government, increasing international defense cooperation, enhancing price and quality via marketing strategy and other necessary measure.

The amount of offset cost having no impact on the performance result of defense enterprise can be interpreted as lack of effectiveness on the export support policy being directed linked with government's offset program policy. The acquired total amount of offset program from 1983 to 2007 is $12 B and counter export amount is 31% of the total amount acquired, which accounts for $3.7 B. However about half of these exported offset materials are general materials and government recommended products and that the remaining exported defense materials were actually originated from overseas imported raw materials. Thus the amount of export is not reflected on company's performance result.

The Relationship between Defense Industry Promotion Policy and Management Performance of Defense Enterprise within Each Business Category

As synthesizing selected and rejected results with regards to the hypothesis 5 with the relationship between defense industry promotion policy and management performance of defense enterprise classified by 8 domestic defense industries, it presented the following TABLE 5.

TABLE 5

Hypothesis Test Results 1 (Hypothesis 5)

Category		Aviation	Firepower	Ammunition	Maneuver	Communications	Warship	CBR	Others
Test Result	Selected	4	2	4	3	3	1	0	1
	Rejected	0	2	0	1	1	3	4	3

As seen the TABLE 5, the research model rejected 3 out of 4 hypotheses established by this study, it was maneuver, CBR, and other industry. It can be inferred that governmental promoting policy of defense industry that currently has been propelled since 1980 is comparably less effective with regards to maneuver, CBR, and others than other industry. Hence, further governmental policy for defense industry promotion is required to perform more detailed and realistic policy to adjust with the industry environment and characteristics in terms of maneuver, CBR, and others.

Following TABLE 6 is synthesized and arranged the status of 8 industries selected and rejected in domestic defense industry with regards to the established hypotheses classified 4 sectors that contains government policy of defense industry promotion. This content can be utilized by one of indices that represents how the big four policy of defense industry promotion driven by government has been realized which has been push ahead from 1980 to now. According to the TABLE 6, comparing a policy for system improvement (a number of designated defense enterprise) with warship, CBR, others is not effective to other types of businesses. Comparing a policy for R&D revitalization (rate of localization) with warship, CBR, others is not effective to other types of business. Comparing a policy for Improving Management Condition (amount of newly invested facility) with firepower, maneuver, communications, CBR, others is not effective to other types of businesses. Comparing a Support Defense Export policy (amount of defense export) with firepower, warship, CBR is not effective to other types of businesses.

TABLE 6

Hypothesis Test Results 2 (Hypothesis 5)

Defense Industry Promotion Policy	Hypothesis	Test Result	Number	Sector
System Improvement	Number of Designated Defense Enterprise	Selected	5	Aviation, Firepower, Ammunition, Maneuver, Communications
		Dismissed	3	Warship, CBR, Others
R&D Revitalization	Rate of Localization	Selected	5	Aviation, Firepower, Ammunition, Maneuver, Communications
		Dismissed	3	Warship, CBR, Others
Improving Management Condition	Amount of Newly Invested Facility	Selected	3	Aviation, Ammunition, Warship
		Dismissed	5	Firepower, Maneuver, Communications, CBR, Others
Support Defense Export	Amount of Defense Export	Selected	5	Aviation, Ammunition, Maneuver, Communications, Others
		Dismissed	3	Firepower, Warship, CBR

Lastly, the following TABLE 7 shows a specific test result regarding 4 hypotheses from 8 different classifications.

TABLE 7

Hypothesis Test Results 3 (Hypothesis 5)

Category		Hypothesis	Sector	Test Result	Correlation Coefficient		
					Growth	Profitability	Productivity
Defense Industry Promotion Policy	System Improvement	Number of Designated Defense Enterprise	Aviation	Selected			.918**
			Firepower	Selected	.764*		
			Ammunition	Selected	-.775**		
			Maneuver	Selected	.642*		
			Communications	Selected	.895**		
			Warship	Rejected			
			CBR	Rejected			
			others	Rejected			
	R&D Revitalization	Rate of Localization	Aviation	Selected	.771**		
			Firepower	Selected	.558*		.873*
			Ammunition	Selected	-.583*	-.829*	-.782*
			Maneuver	Selected		.775*	.919**
			Communications	Selected	.555*	.955**	.883**
			Warship	Rejected			
			CBR	Rejected			
			others	Rejected			
	Improving Management Condition	Amount of Newly Invested Facility	Aviation	Selected			-.812*
			Firepower	Rejected			
			Ammunition	Selected			-.943**
			Maneuver	Rejected			
			Communications	Rejected			
			Warship	Selected			.829*
			CBR	Rejected			
			others	Rejected			
	Support Defense Export	Amount of Defense Export	Aviation	Selected	.442*		.793*
			Firepower	Rejected			
			Ammunition	Selected	.763**		
			Maneuver	Selected	.592**		
			Communications	Selected	.531**		
			Warship	Rejected			
			CBR	Rejected			
			others	Selected	.429*		

* $p<0.05$, ** $p<0.01$

The Relationship between Characteristics of Defense Enterprise and Management Performance of Defense Enterprise within Each Business Category

Based on the TABLE 8 with the hypothesis testing result regarding the relationship between characteristics of defense enterprise and management performance of defense enterprise within each business (hypothesis 6i) in defense industry, growth, profitability and productivity in 8 enterprises in the defense enterprises has been confirmed that there is all contained statistically significant difference. Hence, 4 out of 4 hypotheses set are all selected regarding the research model. Those analysis results are presented implication to all both government and defense enterprise that performed and established the defense industry promotion policy. That is, defense industry promotion policy under certain circumstances by industry classification is came to the fore as the policy has to be specialized and materialized in detail in the government perspective. Moreover, it may be predetermined the management performance will be achieved by differentiated industry area depending on efforts for management improvement such as production facility rationalization, restructuring, downsizing, localized rate enhancement, production enhancement.

TABLE 8

Hypothesis Test Results (Hypothesis 6)

Hypothesis	Performance Index	p value	Test Result
Difference in growth	Amount of Sales	.000	Selected
Difference in profitability	Amount of Operating Profit	.000	Selected
Difference in productivity	Amount of Value Added Rate per Employee	.000	Selected

DISCUSSION

Summary and Implications

Deducted research results are followed as arranged in detail via empirical study.

First, defense industry promotion policy of government is positively influenced on the management performance through the hypothesis testing (hypothesis 1-4) regarding the relation on management performance in defense enterprises which has been driven since early 1980 to now. The positive effect is shown in 7

factors; a number of designated defense enterprises and materials in system improvement area, research development cost and localized rate in R&D revitalization area, improvement cost of defense power and overseas introduction cost in management condition improvement area, and an amount of export in defense industry export support area. Moreover, the 3 factors; amount of offset cost, new facility investment, and nurture fund support amount, are not significantly influenced on the management performance in defense industry.

Second, an industry of aviation and ammunition is correlated with management performance in four factors; a number of designated defense enterprise, localized rate and new facility investment, and export amount through the hypothesis testing (hypothesis 5) with regards to the promotion policy and management performance in defense enterprise. Moreover, maneuver and communication industry is correlated with management performance in three factors; a number of designated defense enterprise, localized rate and export amount. Firepower industry is correlated with management performance in two factors; a number of designated defense enterprise, and localized rate. However, warship industry is correlated with management performance in new facility investment and other types of businesses is correlated with management performance in export amount, but CBR industry is not correlated with management performance in four factors.

Third, growth, profitability and productivity as indices of management performance in 8 domestic defense industries have a statistically significant difference through the hypothesis testing (hypothesis 6) regarding the relationship between characteristics and management performance in defense enterprise.

Implications are as followed as obtaining the result from the empirical research.

First, the result of empirical analysis utilizing the management performance indices of domestic defense enterprise that has been accumulated is not the satisfactory level to effectiveness in past government policy for defense industry promotion, but to the extent it is possible to get a positive estimation. That is, the analysis result that reported 7 out of 11 selected factors as independent variables influenced on the management performance is recognized that a policy for the defense industry promotion of successive government as a subordinated system of national defense policy has been taken the positive-functioned role. Selected four sectors as independent variables, that is, system improvement, R&D revitalization, management condition improvement, export support in defense sector, through the hypothesis regarding the affected relation between

promotion policy and management performance in defense enterprise in this study and selected 11 influential factors as research variables consistently emphasized in successive government at defense industry promotion policy. In other words, those 11 influential factors applied to the domestic defense enterprise for development through the several detailed policy over 30years. Therefore, establishing the mid-term goal, 'promoting defense industry as a new economic growth' as a national agenda as reflecting the critics and self-reflection in past governmental policy of defense industry on and selecting and driving the major 4 national policy which has been consistently performed in the BASIC PLAN FOR DEFENSE INDUSTRY PROMOTION (2008-2012) will be estimated as timely and compatible choice in reality. Meanwhile, offset trade, new facility investment, nurture funding has to be urgently required the improvement as the factors above are not significantly influenced based on the analysis result. Hence, the current government has to be re-recognized this circumstance and require to perform the regular evaluation via feedback system not to follow the failure committed by past government experienced.

Second, the more specialized concern is required regarding maneuver, CBR, others in eight businesses of domestic defense enterprise according to the empirical analysis result that represented the relationship between nurture policy and management performance. Based on the result, those three businesses were not significantly correlated with management performance except a certain factor. Therefore, to obtain the policy effectiveness it requires the specific and realistic alternatives to fit the industrial environment and characteristics.

Third, to make virtuous circled structure by economic effect of defense industry, the priority has to be focused on the detailed policy propulsion for export revitalization and localization. The empirical analysis result regarding correlation between the government policy for defense industry promotion and management performance by business type in this industry presented that the export record and localization factor is positively correlated with management performance. This represent that realizing 'promoting defense industry as a new economic growth' in BASIC PLAN FOR DEFENSE INDUSTRY PROMOTION (2008-2012) established by current government is timely decision for government export support policy for defense industry.

Fourth, the defense industry promotion policy of government has to be strategically applied to the businesses’ characteristics in defense industry. Based on the empirical result that the domestic defense industry has significant difference in management performance by business characteristics the government policy with management

improvement effort require to consider the industrial environment in domestic and abroad.

Desirable Policy Alternatives for Korean Defense Industry Development

The empirical analysis result performed by this study is notified that BASIC PLAN FOR DEFENSE INDUSTRY PROMOTION (2008-2012) as a defense industry promotion policy is suitable and feasible. Hence, the major four policy; strengthening competence through management condition improvement, defense industry nurture through R&D revitalization, management condition improvement and defense export support is the timely persuasive decision for new economic growth mechanization achievement. To effectively perform this, government, military, defense enterprise, and authority of academic require to cooperation and social overall concern. In the context of this, the policy alternatives can be suggested as extracting insufficient area in the BASIC PLAN FOR DEFENSE INDUSTRY PROMOTION (2008-2012) for future Korean defense industry development. It is separated into three perspectives, that is, government, Ministry of National Defense, DAPA.

In the government perspective, it can be divided into three sections: credibility improvement regarding policy will, cognitive share and administrative cooperation, and close cooperation between government and defense enterprise. First, it is about the credibility improvement about the political will in government defense industry promotion. The defense industry in Korea is dominantly estimated that the national strategies are not consistent to the policy and the policy has been affected by successive political power. Namely, it has to be acknowledged that the management innovation motive of enterprises has been weakened by absence of vision and mid- long-term plan in terms of national dimension. Hence, government has to prepare the vision and mid- long-term plan for implanting credibility to enterprise as giving motive to management innovation, investment and technology development. Second, sharing the recognition and administrative cooperation are nationally required with regards to the defense industry issue as reinforcing the competitive power in the industry. The performance goal, entering into world ranking 10 in defense industry export and providing localized high-tech weapon in 2020 will not be achieved only by the DAPA. In other words, social overall concern for this issue and cooperation are nationally required. Third, a close cooperation is required between government and defense enterprise as it is the partner for high-end military power and national economic development. The current issue has been arose

again is responsible both government and enterprise in a certain extent. Hence, government requires forming the reasonable and close cooperated relationship with enterprise as escaping the non-market operation way and the closed way in the past. Moreover, the enterprise must escape the passive management way but exchange the information with government and the enterprise try to reinforce the competiveness as propelling the technology development and market pioneering.

In the perspective of Ministry of National Defense, domestic demand and demand plan for technology level consideration is required in defense industry with acquisition policy. However, the domestic defense industry is recognized that it is unclear and limited business in near future as it has been already reaching the growth limitation (Cho, 2005). Hence, balanced strategic approach will be effective to enlarge the domestic and abroad market at same time. That is, pre-requisite field in domestic is firstly selected then consider the participation range for the enterprise with consideration of local technology level.

In the perspective of DAPA, the basic plan (20008-2012) has to be revised and complemented regularly and it guarantees active participation of interested parties. In the context, sharing the information and defense industrial base capability study is essential. First, the defense industrial base capability study requires to establish the mid-long-term development strategy and to establish the reasonable supportive system of supplied foundation.[4] However, the status of defense industrial base capability study is partially provided to designated enterprises given limited range or those enterprises will not be provided objective data reflected on the policy establishment and acquisition business.[5] Moreover, a systematical study is insufficient regarding the analysis method and fundamental notion of defense industry. Hence, as recognizing the strength, weakness, opportunity and threat factor faced with domestic defense industry it can be foster and develop this industry. Second, sharing information is critical for inducing the active cooperation and participation. In the perspective of market principle and economy, the reason not to invest on the technology investment is the profit not predictable. Hence, if relative documents and national defense document is open to enterprise, then the investment and returns will be predictable and it eliminating the uncertainty to technology development investment which makes enterprise participated in the R&D business.

Future Assignment for Korean Defense Industry Research

A study about the defense industry is required interdisciplinary approach. In case of advance industrialized nations, the study about

defense industry is actively performed in several academic areas such as national defense economics, defense business administration, peace studies, international political economics so on. Centering on the U.S.A and EU nations, numerous laboratories and universities presented recent trend of defense industry that can be classified; a study for clarifying causes and alternatives regarding management performance of defense industry which has been gradually declined (Bowlin, 1999; Barros, 2004), a comparison study between private enterprise and defense enterprise in management performance (Capelle-Blancard & Couderc, 2006), a study for international acquisition to realize the scale of economy and perspective of future defense industry (Weidenbaum, 2003; Dunne, 2006; Bitzinger, 2009) so on. Meanwhile, the current study for Korea defense industry is mostly conducted by status quo analysis with suggesting alternatives as figuring out the real problem arisen. In addition, general research and analysis are conducted with the people who engage in the defense enterprise. Understanding those circumstances, the research field of defense industry is not the academic object yet in Korea.

In short, the future assignment for Korean defense industry research is as followed regarding the promoting policy and management performance in defense industry. First, considering the domestic status and characteristics as a relative newcomer in defense industry the integrative model development is required with internal and external environmental factors affected to the management performance. This model development will be utilized not only academic tool but also practical one. Second, depth study is required to find reasons why there is significant difference regarding management performance in business characteristics. Enterprises will be provided opportunities and abilities to realize the ‘tailored strategy’ which is specialized and fractionized when government applied the defense industry promotion policy. Third, numerous measured tools are required to develop to regularly revised and complemented in the trial process of governmental promotion policy. Also, verification and complemented system is urgently required to obtain the credibility of management performance data classified by each year. Fourth, general academic authorities are required active participation regarding the study of domestic defense industry development. Until today, it is true that the study about the defense industry is not the object of study as interacting general academy authority ignorance and limitation to access the data. The academic circles of management and general interests on expanding range of defense industry development and learning field is required.

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1. http://www.dapa.go.kr/eng/index.jsp
2. Korea Defense Industry Association (KDIA) founded in 1976 as a civilian non-profit organization in accordance with the Special Act of the government for promoting the Korean defense Industry. http://www.kdia.or.kr/
3. Korea Defense Budget Statistics (KBDS) is provided by Korea Institute for Defense Analyses (KIDA). http://www.kida.re.kr/ja_statistic/ KIDA is a government-funded, established in 1979, public research institute that addresses a wide range of defense issues concerning the Korean peninsula and beyond. http://www.kida.re.kr/eng/index.htm
4. The defense industry base (DIB) is the combination of people, institutions, technological know-how, and facilities used to design, develop, manufacture, and maintain the weapons and supporting defense equipment needed to meet national security objectives.
5. For example, the annual report for management performance of Korean defense industry issued by DAPA is classified into military confidential. The barrier to approach useful defense industrial base data makes hard to study and involve in defense industrial arena.

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