

# THE EFFECT OF GOVERNMENT SUPPORT ON E-BUSINESS PERFORMANCE IMPROVEMENT WITH INDUSTRY TYPE IN KOREA

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**Abstract:** This study investigates how government support influences the performance of e-business companies. Drawing on previous studies, funding support for technology development and marketing support, currently accounting for the biggest part of the support provided by the Korean government to the e-business sector, were selected as independent variable. Meanwhile, performance indicators specific to e-business such as human resources development, competitiveness enhancement, profitability, and growth in technology assets were chosen as dependent variable. The data was collected through a survey of CEOs and executives of e-business companies that had received or were receiving government for technology development had a positive influence on competitiveness enhancement, profitability, and technology assets growth. Marketing support, while it had a significant influence on competitiveness enhancement and technology assets growth, proved to have no measurable effect on profitability.

## 1 INTRODUCTION

With the advent of the information era in the 21st century, governments around the world are supporting all the things in competent and highly profitable field with systematic and overall plans. In Korea, to assist the industry in gaining technological independence needed to successfully compete in the global information race, its government has been expanding and diversifying its support toward industry for the development of next-generation technologies, their commercialization and creation of new business models based on these technologies. The goal is to foster new engines for future growth of the Korean Industry. As is well-known, South Korea is today among the world's most advanced nations in terms of information technology. The country's rise as a world IT powerhouse-that Koreans like to call "IT Korea"-owes much to an ideal combination of active government support for technology development with an equally active investment in technological innovation by its industry. Up to this time, South Korea has succeeded in building "IT Korea" in deed as well as in name due to various complex factors such as supports of

government, constant efforts of enterprise for the development of new technology and the national character suitable for IT industry

The number of studies assessing the achievements of governments of government support programs in this field is, as a matter of fact, surprisingly small. Assessments provided by a handful of existing studies on this topic are hardly satisfactory, as their focus is too narrow, dealing, for instance, with a single project carried out by one particular institution. These studies are at the same time too general to be informative or useful, as they measure the effect of a government support program on the industry as a whole, and not a specific industry sector. Also, whilst there have been a sizeable number of studies investigating private-sector factors influencing the growth of the e-business industry, very few inquiries have been made into similar influence factors coming from the public sector. Most studies on public-sector influence factors have been broadly concerned with the industry as a whole, and not with e-business or any other specific sectors. To address these shortcomings in the existing literature, a research model expanding on existing models has been elaborated, comprising independent variables that

are primarily macro-variables and dependent variables that are primarily micro-constructs. The independent variables, variables related to government support in this study, have in their scope all technology development funding programs and marketing support programs by government institutions, while the dependent variables relating to the effect of government support are exclusively concerned with e-business; in other words, they only measure the effect of the support programs on e-business.

## **2 THEORETICAL BACKGROUND**

### **2.1 Government Support Programs**

Technology Development funds are programs through which the government provides funding toward technology development projects in the form of interest-free and unsecured loans with no collateral requirements. The details of support available under these programs are tax relief, funding support for technology development, joint R&D projects, technology business incubation funds and technical support and training. The Marketing Support System is the Small and Medium Business Administration Sponsors exhibition activities by SMEs and SME associations in an effort to afford them marketing opportunities and help expand their sales channels. Funding is provided toward the cost

### **2.2 Previous Literature**

Seoh, S.H.(1998) investigated, in a study in the context of a research project sponsored by the institute for industrial policy studies, the evolution of industrial infrastructure technology and Seoh, S.H.(2000) assessed the effectiveness of the technology innovation and development program by the Small and Medium Business Administration, identifying also key factors influencing the project's outcome. Kim, H.U.(2004), in his study on the effect of government funding support on the performance of SMEs, criticized the existing literature, saying the most of the previous studies on this subject focused more on strategies on how to improve funding programs than measuring the actual effectiveness of existing programs, and that their evaluations of the effectiveness of a funding support program based on more specific evidence, in other words, using concrete data of individual companies receiving

funding assistance. His analysis, using Ashenfelter's(1978) model, found that there was no real difference in terms of operating profit between companies that were beneficiaries of government funding and those that were not, although in some rare cases, government funding produced adverse effects on the operating profit of beneficiary firms. This study also reported that government fund support proved particularly ineffective, when provided to recent start-ups and young companies. Kim, W.G.(2007) estimated the relationship between labour productivity and R&D intensity, using a fixed effects model with data results from 18 industrial and yearly panel data between 1993 and 2005. Song, H.J. et al.(2006) compared SMEs receiving funding support from government with compared marketing support programs in place at that time to determine which of them are most effective. Marketing support programs by the government which proved the most effective were marketing training programs, programs sponsoring participation in exhibitions, and programs providing support for designing websites and publishing catalogues, product certification programs and overseas market development support programs. Ashenfelter(1978) investigated the effect of a job training program by the U.S governments. This study evaluated the effectiveness of a job training program conducted by the U.S government, sometime around 1964 by looking at whether there was any significant difference in wages between workers who attended the program and workers who had not.

## **3 RESEARCH MODEL AND HYPOTHESES**

### **3.1 Research Model**

Drawing on previous studies, the following research model was developed to determine how government support programs for SMEs and venture firms influence the growth and development of the e-business industry. For the government support program, the most dominant technology development fund support and marketing support were determined as variables. And for the development of the e-business industry, its unique elements vis-à-vis those of other industries-namely, the fostering of human resources, competitiveness enhancement, profitability, and increase in technological – were determined as variables.

Based on the existing researches examined above, a research model, as shown in <figure 1>.

All question items were measured on the basis of a 5-point-Likert scale.

### 3.2 Research Hypotheses

- H1: The government support program will have a positive (+) impact on enhancing competitiveness.
- H1.1: The technology development fund support will have a positive (+) impact on enhancing competitiveness.
- H1.2: Marketing support will have a positive (+) impact on enhancing competitiveness.
- H2: The government support program will have a positive (+) impact on profitability.
- H2.1: The technology development fund support will have a positive (+) impact on profitability
- H2.2: Marketing support will have positive (+) impact on profitability.
- H3: The government support program will have a positive (+) impact on increasing technological assets
- H3.1: The technology development fund support will have a positive (+) impact on increasing technological assets.
- H3.2: Marketing support will have a positive (+) impact on increasing technological assets.
- H4: The effects of the government's support program on the development of the e-business industry will differ according to industry type
- H 4.1: The effects of the technology development fund support on the development of the e-business industry will differ according to industry type
- H 4.2: The effects of the marketing support on the development of the e-business industry will differ according to industry type

## 4 RESULTS OF EMPIRICAL ANALYSIS AND DISCUSSION

### 4.1 Characteristic of Research Sampling

Questionnaires were used when surveying the SMEs and venture firms which received the governmental support. Members of KITIA were surveyed online, while members of the IT SoC Association and of the Daegu and Gyeongbuk Development Council via e-mail and clients of various banks were surveyed

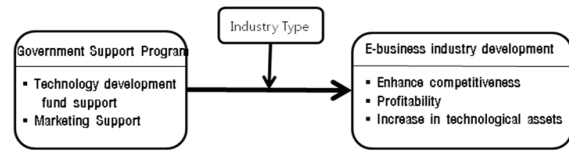


Figure 1: Research Model.

offline. 250 answered copies of the questionnaire were collected from which any copies were removed from corporations not related to e-business along with other disqualified copies, leaving a final total of 131 effective copies. Specifically, the CEOs and other high-ranking officials of corporations were surveyed who could provide responsible answers and better know their organizations in an effort to effectively examine the effects of the government support program on the development of the e-business industry. The characteristics of the respondents and the sampled corporations are outlined in Table 1, Table 2.

Table 1: Characteristics of the sampled corporations.

Category		Count (%)
Industry type	Internet	3(2.3%)
	Mobile	9(6.9%)
	Structuring Infrastructure	3(2.3%)
	IT SoC	27(20.6%)
	IT manufacturing	63(48.1%)
	Others	26(19.8%)
Location	Seoul metropolitan areas	63(48.1%)
	Provincial areas	68(51.9%)

### 4.2 Analysis of the Reliability and Validity of the Measurement Tool

The results of the reliability test indicated that the Cronbach's Alpha value of all the research variables ranged from 0.6 to above 0.8, showing a good degree of reliability (Table 3). A factor analysis was conducted to test the validity of the measurement tool, the major factor analysis was selected, and for the factor rotation, the Varimax rotation was selected from among the orthogonal rotation methods. Finally factor numbers with an Eigenvalue over 1 were selected, as shown in Table 4, Table 5.

### 4.3 Analysis of Correlation between Variables

The correlation between all variables was found to be low except in the case of the correlation between

profitability and competitiveness enhancement which at 0.631 represented a positive correlation, as in the existing researches Table 6.

Table 2: Characteristics of respondents.

Category		Count (%)
Gender	Males	124(94.7%)
	Females	7(5.3%)
Age	<20 years old	2(1.5%)
	21-30 years old	34(26%)
	31-40 years old	65(49.6%)
	>50 years old	30(22.9%)
Education	High School or under	2(1.5%)
	Junior college(attending)	7(5.3%)
	University(attending)	58(44.3%)
	Graduate School(attending)	64(48.9%)
Job	R&D	44(33.6%)
	Administration	76(58%)
	Sales	1(0.8%)
	Production	1(0.8%)
	Others	9(6.9%)
Position	Employees	2(1.8%)
	Assistant Managers	12(10.6%)
	Managers	11(9.7%)
	Deputy General Managers	10(8.8%)
	General Managers	9(8%)
	Executives	32(28.3%)
	CEOs	37(32.7%)

Table 3: Results of the Reliability Test.

Research variables		No. of items	Alpha's coefficient
Government support	Technology development fund	4	.608
	Marketing support	3	.803
e-business Industrial development	Enhance competitiveness	5	.627
	Profitability	3	.621
	Increase technological assets	3	.624

Table 4: Factor analysis of the independent factors.

	Factor	
	Factor 1	Factor 2
Technology development2	<b>.829</b>	.123
Technology development4	<b>.803</b>	.091
Technology development1	<b>.660</b>	.336
Technology development5	<b>.507</b>	.442
Marketing2	.170	<b>.934</b>
Marketing3	.191	<b>.901</b>
Marketing1	.218	<b>.807</b>

Table 5: Factor analysis of the dependent variables.

	Factor		
	Factor1	Factor2	Factor3
Competitiveness3	<b>.832</b>	.148	.093
Competitiveness2	<b>.811</b>	.168	.117
Competitiveness5	<b>.720</b>	.393	.015
Competitiveness4	<b>.563</b>	.081	.307
Competitiveness1	<b>.517</b>	.414	.137
Profitability4	.170	<b>.854</b>	.115
Profitability1	.259	<b>.812</b>	.149
Profitability3	.292	<b>.761</b>	.091
Technological3	.139	.017	<b>.861</b>
Technological2	.367	.153	<b>.635</b>
Technological1	-.074	.481	<b>.599</b>

Table 6: Correlation between the research variables.

Variable	Technology Support (1)	Marketing support(2)	Competitiveness(3)	Profitability(4)	Tech. assets(5)
(1)	1				
(2)	.529**	1			
(3)	.461**	.221*	1		
(4)	.277**	.079	.587**	1	
(5)	.303**	.073	.540**	.908**	1

#### 4.4 Verification of the Hypotheses

A multiple regression analysis was conducted to verify the hypotheses on the relationship between the government support program and the development of the e-business industry, the results of which are shown in Table 8. A moderated regression analysis was conducted to test the mediating effects of industry type on the relationship between the government support program and the development of the e-business industry. After industry type was set as a dummy variable (IT Manufacturing =0, non-IT Manufacturing = 1), it was established as an interaction term with the independent variable, i.e. government-supported industry, and was included in the regression analysis to test hypothesis 4. As a result, the moderating effects of industry type were found to be statistically insignificant at the significance level of 5 of all interaction terms; therefore, hypothesis 4 was rejected.

Table 7: Results of the Regression Analysis.

Independent variable	Competitiveness enhancement			Profitability			Increase in technological assets		
	$\beta$	t	p	$\beta$	t	p	$\beta$	t	p
Technology Development support	.486	5.239	.000***	.327	3.260	.001***	.367	3.721	.000***
Marketing Support	.135	2.669	.009***	-.095	-.944	.347	-.121	-1.226	.222
F value	17.315			5.745			7.305		
R <sup>2</sup>	.214			.083			.102		

Table 8: Results of the Hypotheses.

Hypothesis	Independent variables	Dependent variables	Moderating variables	Finding
H1.1	Technology development fund support	Competitiveness enhancement		Supported
H1.2	Marketing support	Competitiveness enhancement		Supported
H2.1	Technology development fund support	Profitability		Supported
H2.2	Marketing support	Profitability		Rejected
H3.1	Technology development fund support	An increase in technological assets		Supported
H3.2	Marketing support	An increase in technological assets		Rejected
H4.1	Technology development fund support	e-business industry development	Industry type	Rejected
H4.2	Marketing support	e-business industry development	Industry type	Rejected

## 5 CONCLUSIONS

### 5.1 Summary of the Research

This study, targeting Korea's e-business-related SMEs and venture firms, examined the effects of the government support program on the development of the e-business industry, and verified whether the effects of the government support program on the development of the e-business industry differed according to industry type, i.e., IT manufacturing and non-IT manufacturing.

The findings of the research indicated the following: First, as regards the government support program, the technology development fund support was found to have significant positive effects on all areas including the enhancement of corporate competitiveness, profitability, and increase in technological assets. The technology development fund support – whether direct or indirect motivated corporations to make R&D efforts, thereby influencing their competitiveness enhancement, increase in technological assets, and profitability. Second, as regards the government support program, market support was found to have significant positive effects on corporations' competitiveness enhancement and increase in technological assets, but not on their profitability. From the short-term

perspective, the marketing support-although small-scale and indirect-enhance corporations' marketing awareness and ability, and thus enhanced their competitiveness and technological assets, but did not have any direct effects on their profitability. This can be interpreted to mean that it may take more time to improve profitability on the basis of enhanced competitiveness and an increase in their technological assets. Lastly, there was no difference in the relationship between the government support program and the development of the e-business industry according to industry type.

### 5.2 Implications and Limitations of the Research

This study further developed the existing research model, and thus re-established independent variables from holistic and macro perspectives, and dependent variables from micro perspectives. The study included all the relevant institutes' diverse technology development fund programs and marketing support programs in the independent variables, namely the government support program, and limited the dependent variable to the e-business industry. In fact, it is the foregoing features which give this study its particularity.

Also, given the characteristics of the IT industry and the e-business industry, such as their rapidly



changing speed and their core technologies' importance, the protection, reliability and development speed of the technologies of such industries receive greater emphasis than in other industries. Thus, these points were conceptualized into "technological assets", which was then established as a dependent variable, giving the study a profound meaning.

Despite these theoretical and working implications, the study has several limitations, outlined below, which it is hoped will be tackled in future research:

First, this study targeted only the beneficiaries of the government support program, and thus the possibility that the respondents were led into giving affirmative answers cannot be excluded. Such, any future research will be able to produce more accurate results if it includes non-beneficiaries as well.

Second, apart from questionnaire-based surveys, if both the government's and the private sector's databases on the government support program had been utilized along with their databases on industrial trends, more objective and precise results may have been produced.

Third, it would be worthwhile to utilize as a mediating variable the frontline industries relating to the e-business industry- such as the IT SoC and IT industry – in an effort to observe via which paths the government support program has direct and indirect effects on the development of the e-business industry.

Lastly, if new variables such as IT support and education support were added to the independent variables-technology development fund support and marketing support of the government support program and examined, and if dependent variable-such as technological property- that reflect the major characteristics of the e-business industry, along with their measurement items, were developed and examined.

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