On exploring factors for enhancing export competitiveness in IT Convergence industries*

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Abstract

Purpose - The IT convergence industry, which is the subject of this study, is the main strategy field during the 4th industrial revolution era. Against this background, it is urgent to establish policy measures to survive and spread export products in the global industries.
Research, design, data and methodology - In order to achieve this goal, we conducted the Importance - Performance Analysis (IPA) and found that it is necessary to develop tailor - made marketing support for small and medium sized IT exporters and to develop export strategy products with competitive technologies.
Results - Above all, customized marketing support for IT export-related SMEs was needed. Next, in the first quadrant, strategic products, qualitative level, global, value added, and information systems were included, and it was found that 'development of export strategic products with competitive technologies' was necessary. In the third quadrant, related variables calculated at present time are not urgent variables.
Conclusions - In this study, it would be necessary to calculate the additional implications of the variables that are not considered in this study, including future studies, because the methods considered here as analysis variables are carried out in comparison with the previous studies.

Keywords: Convergence, Export, Information Technology, IPA, the fourth industry revolution.

JEL Classifications: C10, C11.

1. Introduction

The information technology (IT) convergence industry, which is the subject of this study, is the main strategic field of information technology in the fourth industry revolution (Han & Han, 2013). As a result, it can be regarded as an industry that has a very important and sensitive impact on the domestic economy. Therefore, it is necessary to nurture

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a self-sustaining industrial base that has its own competitiveness in a global environment and has a profit source in various industries, rather than a concentrated industry in any one sector. This will enable the domestic economy to have a positive and hopeful future.

Under this background, it is urgent to establish policy measures to survive and spread export products in the global and global industries. The development of these export industries has the effect of improving the employment of domestic employment and the structure of related industries(Jeju Research Institute, 2011). Therefore, this study is aimed to explore the factors that promote the export of small and medium sized IT convergence industry in Jeju region under the open trade environment of free trade agreement (FTA).

Finally, based on the analysis results of this study, it can be effectively applied and utilized as a strategy for establishing and enforcing factors for export activation of small and medium IT convergence industries.

2. Theoretical background and Analysis process

2.1. Theoretical background

There are many studies on export determinants related to export activation or competitiveness to be discussed in this study(Courant & Deardorff, 2011; Moran, 1988; Zou & Stan, 1998). In particular, in terms of export marketing, Zou and Stan (1998) divides the determinants into seven categories: management characteristics, firm characteristics and competitiveness, industry characteristics, overseas market characteristics, domestic market characteristics, marketing strategies, and management attitudes and perceptions Respectively. There are three types of export decision factors that distinguish these studies in detail: managerial aspect, corporate aspect, and environmental aspect(Terjesen, & Hessels, 2009).

More research on exporting SMEs focuses mainly on research to determine determinants that affect export performance(Zhou, Wu, & Luo, 2007; Kang, 2012). Therefore, this study can be regarded as a meaningful study in that it is a company in Jeju area which is a spatial area of this study. In other words, it is meaningful to find the determinants of export performance of SMEs in terms of size. In particular, the study of Kang(2012) statistically analyzed the aspects of innovativeness of SMEs affecting exports. Here he emphasized the innovation of SMEs. As a limited study in Jeju, Park and Park(2012)presented policy implications for export growth strategies through comparing export competitiveness of Korean and Chinese flavors. Lee and (2012) emphasized the necessity of export support projects in Jeju. In order to analyze the support measures for export activation of products in Jeju region, the study was conducted to investigate the effect of import / export And the level of support policy was analyzed by the method of performance analysis.

Therefore, in this study, we try to explore the factors of export activation by the IPA method in terms of comprehensive policies including support policies based on the preceding studies. In particular, this study approaches the competitiveness of IT convergence industry in terms of export competitiveness.

2.2. Analysis scope

This study mainly focuses on exploring the factors for export activation of the fusion and composite industries. These IT convergence industries create new creative values through the synergy between IT and traditional industries or new technologies such as IT and NT (nanotechnology), BT (biotechnology) and CT (cognitive technology) It is defined as a technology leading to change and future economic change(Han & Han, 2013). In other words, between IT and existing traditional industries (medical, automobile, energy, construction, machinery, shipbuilding and textile) or between IT and NT, BT It can be seen as an industry that leads socio-cultural change and future economic change by creating new creative value through the synergy effect of the same new technology. In this study, most existing industries are based on IT infrastructure. Therefore, this study covers all industries related to existing IT industry as a comprehensive concept.

In particular, as the growth of the IT market, which has been continuing in the Korean economy since the late 1990s, has slowed down, strategies to create new industries based on existing core technologies and strategies to preemptively utilize fast technologies must be pursued. In order to strengthen the competitiveness of the industry in order to create new markets, it is urgent to combine IT technology with new technologies such as NT, BT and CT to create new markets. By concentrating investment in R & D that combines commercialization technology with fast emerging technologies, export strategies for securing new growth engines should be established in order to dominate new markets.

2.3. Analysis method

In order to carry out the study purpose of this study, firstly, related measurement items of the export competitiveness factor in the IT fusion and the composite industry are grasped through the existing research. Second, based on the selected factors, And the characteristics of these. In other words, the policy implication is derived through the Importance-Performance Analysis (IPA) method based on the questionnaire to achieve the above-mentioned research purpose. The questionnaire was drawn up based on the factors selected above, and the questionnaire was divided into 5 items(Lim, Lee, & Kim, 2008; Kim, & Kim, 2012) for the search for factors of export competitiveness in the IT fusion and hybrid industry. The questionnaire responses were measured by the Likert 5 - point scale and the severity and satisfaction were examined separately. In January 2019, this survey was conducted with a total of 100 replies to IT and trade workers (including students).

3. Analysis results

In this study, IPA analysis was conducted using the SPSS 18.0 statistical package, and the factors presented in the previous study (Kim & Kim, 2012) were used as IPA analysis items. In particular, there are cases where IPM (Importance-Performance Map) analysis based on PLS-SEM (Partial Least Squares - Structural Equation Modeling) is performed. This method focuses on the relative importance of the total effect on total satisfaction as the final dependent variable(Hair et al., 2016; Garson, 2016). However, in this

study, we also use the existing IPA analysis method because the questionnaire includes the additional importance questionnaire items. As a result of the analysis, it was confirmed that the average of the final variables utilized in this study is much lower than the importance (Table 1).

Table 2 shows the statistical significance of the significance and satisfaction difference shown in Table 1

(Table 2).

In this study, we conducted a T-test on the Paired sample to analyze the difference of the mean value between the importance and satisfaction of each variable calculated in the table. All the variables showed statistically significant difference. Therefore, it is basically shown that the IPA analysis to be conducted in this study is meaningful.

Table 1: The importance and performance level of each factor

Export Activation Factor	Abbreviation	Importance level	Performance level
Strengthen global competitiveness of export industries / items in Jeju	Global	4.11	3.63
Customized marketing support for exporting SMEs	Marketing	4.12	3.52
Efficient overseas marketing one-stop service establishment	One-stop	3.92	3.55
Extension of incentives on tax decrease and export SMEs	Incentive	3.96	3.52
Expansion of export base such as improvement of distribution system	Export base	4.04	3.54
Identification of export growth items and differentiate support systems among companies	Support systems	3.97	3.48
Securing competitiveness of the product quality level	Quality level	4.11	3.68
Development of export strategy products with competitive technology	Strategy products	4.14	3.68
Customized program management based on size and capacity of exports	Program	3.94	3.49
Production of high value-added products using Jeju's local resources	Value added	4.03	3.65
Attracting and fostering competitive export-oriented manufacturing-oriented company	fostering company	4.04	3.58
Competitive export product development utilizing regional characteristics	Export product	4.01	3.71
Established international direct flights of sea and air	Direct route	3.91	3.54
Establishment of joint logistics center utilizing airport, port harbor	Logistics center	3.94	3.56
Establish export and logistics information system	Information system	4.04	3.60

Table 2: The results of the mean difference test for the importance and performance of each factor

Abbreviation	Average			t-value	Significance
	Importance	Performance	Difference		
Global	4.11	3.63	0.48	5.30	0.00
Marketing	4.12	3.52	0.60	6.36	0.00
One-stop	3.92	3.55	0.37	4.36	0.00
Incentive	3.96	3.52	0.44	5.36	0.00
Export base	4.04	3.54	0.50	6.83	0.00
Support systems	3.97	3.48	0.49	5.78	0.00
Quality level	4.11	3.68	0.43	6.27	0.00
Strategy products	4.14	3.68	0.46	5.09	0.00
Program	3.94	3.49	0.45	4.98	0.00
Value added	4.03	3.65	0.38	4.89	0.00
Attractingcompany	4.04	3.58	0.46	5.15	0.00
Export product	4.01	3.71	0.30	4.45	0.00
Direct route	3.91	3.54	0.37	4.70	0.00
Logistics center	3.94	3.56	0.38	4.41	0.00
Information system	4.04	3.60	0.44	5.62	0.00

Especially, the difference value in this study is somewhat positive in that it is low compared to the previous studies, and the variables with large differences in mean values suggest a need to reduce the difference in the future. For example, the factors with the highest t value in the table are 'Export base (expansion of export base such as improvement of distribution system), t-value=6.83', 'Marketing (customized marketing support for export small business) 6.36' and so on. Therefore, it is necessary to pay attention to the interpretation with only the difference. Therefore, it is necessary to present a policy plan through relative comparison between the variables to be applied through the IPA analysis. In the IPA analysis, the importance and satisfaction of each variable are placed on a two-dimensional line, where the X axis represents the level of export activation satisfaction and the higher the level of satisfaction toward the right. And the Y axis shows the importance figures of export activation factors. In this study, the mean value of each importance and achievement was calculated as the central axis on the X axis (3.58) and the Y axis (4.02). Table 3 summarizes the factors in each quadrant section according to Fig. 1 (Fig. 1).

Table 3: Classification of factors in quadrants by IPA analysis

Section	Factors
I Quadrant (keep)	Strategic product, quality level, global, value-added, information system
II Quadrant (concentration)	arketing, export base, attracting companies
III Quadrant (low priorities)	Support system, incentive, program, direct route, one-stop, logistics center
IV Quadrant (excess)	Export product

According to the results of the analysis, in the first quadrant, strategic products, qualitative level, global value added, and information system were included. This indicates that respondents consider these factors to be significant and relatively satisfied. Therefore, this indicates that maintenance should be continued. For example, it is estimated that 'strategic product' is the highest position variable. This suggests that IT companies need to develop 'export strategy
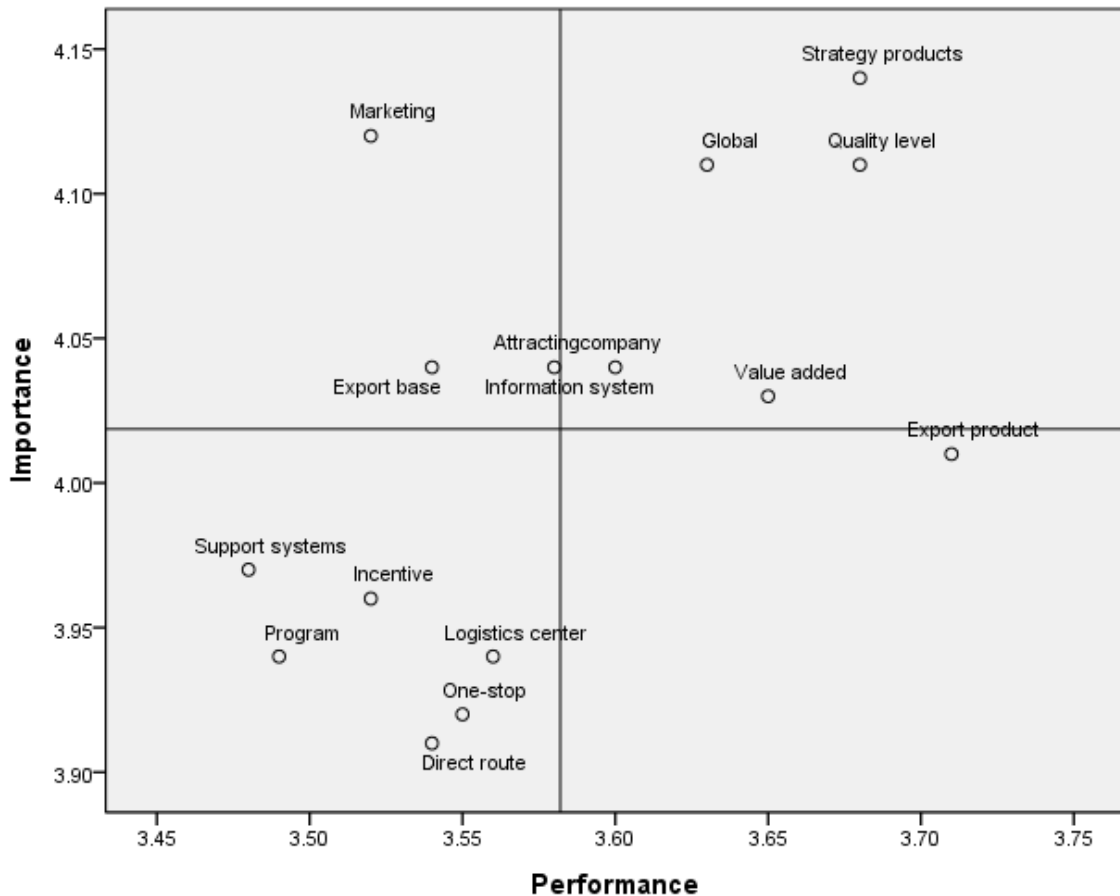

Figure 1: IPA diagram based on importance and performance of each factor

product with competitive technology' because it is small and small. In particular, in the second quadrant, marketing variables are meaningful, which is interpreted as a policy measure with a low degree of satisfaction but a high degree of importance. In other words, customized marketing support for IT export-related SMEs is essential. It also shows that export-oriented factors (expansion of export base such as improvement of distribution system) can be an appropriate policy measure. In the third quadrant, it is interpreted as a policy variable that shows both satisfaction and importance as low policy. In this study, support system, incentive, program, direct route, one stop, and logistics center were calculated. Although these measures have not emerged as urgent variables at present, they may become important if the export environment changes in the future. For example, the support system shows a very low degree of satisfaction, but it shows the highest importance among the variables in the three quarters. This suggests that it may become a necessary policy alternative in the future. Finally, in the 4th quadrant, it is interpreted as a scheme with a low degree of importance but a high degree of satisfaction. In this study, the only policy measure was to develop competitive export products that utilize local characteristics. This suggests that IT SMEs in Jeju are satisfied with the development of export products that show regional characteristics, but their level of satisfaction is lower than other standards. However, considering the position in the graph, it can be interpreted that the retention method can be considered.

4. Conclusions

Currently, the proliferation of free trade agreements (FTAs) has made it very important for local governments to establish strategic policy measures in the context of the importance of trade in the local economy(Kim, 2012). In this industrial environment, this study approaches the export competitiveness of IT convergence industry in exploring the factors of export activation by the IPA method in terms of comprehensive policy including support policy based on the previous research.

In order to achieve the above mentioned research objectives, this study compares the policy measures by IPA analysis using the measurement items of the factors of IT fusion and combined export promotion based on the existing research. As a result of applying the IPA, the marketing variables are meaningful in the second quadrant, which is the most significant in the four quadrants. This is interpreted as a policy measure with a low degree of satisfaction but a high importance. In other words, customized marketing support for IT export-related SMEs was needed. Next, in the first quadrant, strategic products, qualitative level, global, value added, and information systems were included, and it was found that 'development of export strategic products

with competitive technologies' was necessary. In the third quadrant, related variables calculated at present time are not urgent variables, but it can be seen that it will be an important measure if the export environment changes in the future. The 'support system' suggests that it may be a necessary policy alternative in the future. In the 4th quadrant, it is estimated that the export policy is a competitive policy for developing competitive export products that utilize local characteristics. This can be considered in view of the position in the graph.

5. Discussion

This study has different implications in that the existing research mainly analyzed export promotion methods in all fields, but analyzed this study only in limited IT SMEs and SMEs in the region. However, it is necessary to calculate the additional implications of the variables that are not considered in this study, including future studies, because the methods considered here as analysis variables are carried out in comparison with the previous studies. Also, currently, considering the environmental characteristics that are of low importance but may become important in the future, it will be necessary to conduct periodic analysis and time comparison. Additionally, current sample scope needs to be extended to more generalized respondents as further research in order to generalize this results.

As a result, policy makers for export promotion within the IT convergence industry can refer to the results of this study for decision making. In this study, it can be meaningful research result in the public institutions related to SMEs, since the policy implications are derived from the characteristics of merger and integration as the IT SMEs, which are likely to be the most central industries in the 4th industrial revolution.

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