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How Do Hidden Champions Differ from Normal Small and Medium Enterprises (SMEs) in Innovation Activities?

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ABSTRACT

Several studies have concluded that hidden champions have unique characteristics when they are compared with other small and medium enterprises (SMEs). However, most of their research has limitations that they highlighted managerial perspectives such as marketing strategies or leadership in investigating their success factors with a qualitative analysis including case studies and interviews. Thus, this paper aims at examining the innovation of hidden champions by considering inclusive perspectives of both technological and managerial aspects to analyze their characteristics in a quantitative manner. For this, several factors to compare hidden champions and normal SMEs are suggested, concentrating on technological as well as managerial perspectives. In addition, statistical analyses such as t-test are performed to test several hypotheses related to hidden champions. The results of the analyses will provide useful implications in understanding the success factors of innovative SMEs and supporting such promising hidden champions in technological and economic perspectives.

Key words: hidden champions, SMEs, success factors, innovation survey, quantitative analysis.

INTRODUCTION

Globalization of R&D and marketing renders the level of competition broad and intensive, causing a critical problem in increasing profits by focusing on domestic market. Thus, many companies necessarily try to extend their market to global market and gradually obtain more market share. In particular, small and medium enterprises (SMEs) that have constraints on resources and infrastructures in human and finance should consider globalization and innovation for existence in this turbulent circumstance. In the perspective of national innovation policy, the role of SMEs is extremely important because the national competence in export is dependent on SMEs rather than large companies. In addition, the globalization of SMEs can catalyze the creation of new growth engines. Recently, the portion of SMEs in export has been dropped in many countries. Moreover, the strategies of SMEs that focus on national and regional markets will be meaningless when the research results of Fraser [5] that global markets will account for approximately 80% of international markets are recognized. Thus, the industrial policies need to support the globalization of SMEs for exploring the potential of economic growth. Hidden champions that are smaller but highly successful companies, concealed behind inconspicuousness and invisibility are highlighted as a new model of innovation of SMEs. Hermann Simon who created the concept of hidden champions analyzed 500 of the world's best unknown companies. Several researchers showed that unique characteristics of hidden champions existed in comparison with other companies. They are normally small and medium enterprises (SMEs) and most of them produce inconspicuous products, exporting most of their products.

However, most of their research has limitations that managerial perspectives such as marketing strategies or leadership are emphasized in investigating their success factors with a qualitative analysis including case studies and interviews [17]. Therefore, this research aims at examining the inclusive perspectives including both technological and managerial aspects to analyze the characteristics of hidden champions in a quantitative manner. For this, first, the concepts of hidden champions are defined by referring existing research. Second, several factors to compare hidden champions and normal SMEs are suggested, concentrating on technological as well as managerial perspectives. In this research, technological innovativeness, technological protectiveness, market initiative and global network are chosen to show the differences between hidden champions and normal SMEs. Third, the innovation

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survey data of SMEs that are collected by science, technology and policy (STEPI) of Korea are gathered and recoded to be fitted to the statistical test of the analysis. Fourth, statistical analyses such as t-test are conducted to test several hypotheses that investigate the differences between hidden champions and normal SMEs as well as between the two types of hidden champions. The results of the analyses will provide useful implications in understanding the success factors of innovative SMEs and supporting such promising hidden champions in technological and economic perspectives.

The structure of this paper is organized as follows. First of all, theoretical background on hidden champion and SMEs is provided by performing existing literature reviews. Then, the research framework that is designed in this research to investigate the characteristics of hidden champions is explained by covering the procedure, important factors and hypotheses. The next section deals with the results and discussions to elaborate the findings from original data and the hypotheses. Finally, in the part of conclusion, the summary, limitations and future research of this paper will be presented.

Literature Review:

Global Strategy of SMEs:

Recently, the capacity for innovation is recognized as one of the core aspects leading to a competitive advantage amongst firms. A regional context that supports innovation and entrepreneurial initiative sometimes encourages competitiveness [15]. However, according to a study which analyzes the relationship between export and economic growth, the export of SMEs plays a critical role in supporting the economic growth [13]. The globalization of SMEs is considered an inevitable factor for continuous growth and a solution on economic crisis [12]. In addition, the outcome of a company is influenced by the structure of company, market, industry and global strategy, indicating that the importance of strategic selection should be emphasized in case of global companies [1].

In general, existing research on global-leading SMEs shows that there are three common characteristics – technological innovation, market strategy and location strategy. First, SMEs which possess the capability for technological innovation can lead a global market. Ventures whose top managers have abundant experience on global market have high-quality of competence and obtain a profitable position [7]. Second, SMEs which concentrate on market strategy can get customer satisfaction. Global managers pursue a global strategy in choosing product strategy, marketing strategy and production [9]. Particularly, export-oriented companies reinforce a lot of global strategy on distribution, marketing and promotion in comparison with domestic-oriented companies [10]. Finally, a location strategy deals with the location of market, classifying it into subsequent markets such as developing countries and developed countries.

Innovation of SMEs:

Although many researchers have studied the concepts, types and mechanism of innovation, there have been very few research on an innovation model specialized for SMEs. Most of related literature deals with entrepreneurial traits or structural characteristics [6], the role of SMEs in the supply chain management [3] and obstacles of their innovation in developing advanced technology [2]. Consequently, there is little examination of the embeddedness of innovation of SMEs [16]. According to Edwards et al. [4], while SME's flexibility and specificity can be advantages in accelerating innovation, few of them have sufficient capacity to manage the whole innovation process by themselves. In general, they lack the resources and capabilities in manufacturing, distribution, marketing, and extended R&D funding. Consequently, while many studies have shown that SMEs tend to have a higher R&D productivity than larger firms, there is still much debate on the innovativeness of SMEs.

SMEs have an obvious role in innovation and encouraging innovation in SMEs is an important policy to stimulate economic development at the local and national levels [8]. Thus, a way to facilitate innovation in SMEs has been explored to discover which factors contributed to the innovation success. Since technology becomes so complex that it cannot be handled by a firm alone and the capability of SMEs is relatively insufficient for critical innovation, collaboration between firms is increasingly regarded as an important factor for success. Thus, SMEs have engaged in various modes of collaboration [11]. In particular, common collaboration modes of SMEs are based on bi-firm networks and include alliances with other firms. Inter-firm collaboration is important for SMEs with limited complementary assets who need to leverage their technology externally [14].

Research Framework:

Research ideas and Procedure:

Many researchers have introduced various types of successful SMEs to provide the direction of national policies. Among others, the concept of hidden champions is regarded as a new and practical notion in export-oriented nations such as Chile and Korea. If unique success factors of hidden champions are characterized by analyzing their differences, many SMEs can reflect them as best practices for innovation. Thus, first of all, the differences between hidden champions and normal SMEs need to be investigated to show the main characteristics of hidden champions. In addition, idiosyncratic types of hidden champions can be analyzed to elaborate the research on hidden

champions. This paper highlights a type of hidden champions that focus on the export trade from the beginning of establishment. This kind of companies can be called as born-hidden champion in order to distinguish them from acquired-hidden champions that become to have the characteristics of hidden champions after the companies are founded as normal SMEs. The pairs of types in each analysis are compared with innovation survey data because the data is public data that the research institute of government collects to generate public reports. Figure 1 shows the diagram of SMEs that this paper considers in order to investigate the important characteristics of hidden champions.

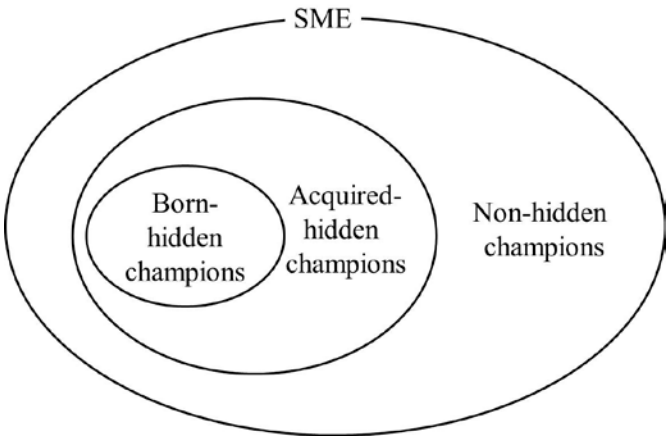

Fig. 1: Types of hidden champions.

Four steps in this research are conducted in order to analyze the characteristics of hidden champions. First, the results of community innovation survey (CIS) which the STEPI collected in 2010 are used to define Korean hidden champions. As a result, SMEs which have more than approximately 40 billion dollars in scale of revenue, 30% in the ratio of export and revenue, 5 billion dollars in scale of profit. This criterion comes from minimum value of companies which were chosen as 33 hidden champions by various institutes such as Economist and Small & Medium Business Administration (SMBA) of Korea. From the criterion, 154 companies from total 1740 companies are derived as possible hidden champions. Second, the types of SMEs are identified on the historical basis of concentrated market (born-hidden champions and acquired hidden champions). Among 154 companies, 51 companies are included in born hidden champions and 103 companies are investigated as an acquired hidden champion. Third, critical factors to examine the characteristics of hidden champions are defined from literature review. Fourth, the comparison between hidden champions and non-hidden champions, as well as born-hidden champions and acquired hidden champions is conducted to show the differences by applying t-test analysis. Figure 2 depicts the overall procedure of this research.

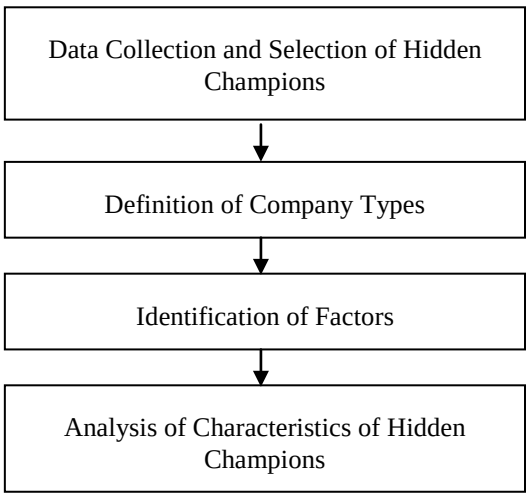

Fig. 2: Overall procedure of this research.

Analytic Factors:

Basically, the analysis of a subject is performed on the basis of relevant factors that are derived from the predefined research concept. Important factors of this paper should be defined to investigate the differences of hidden champions. In this paper, four factors are identified to analyze the characteristics of hidden champions from previous research. The factors are derived from a triad framework of innovation: technology, market and collaboration. This paper concentrates on three perspectives of innovation to shed light on the innovation of hidden champions. In particular, since the technology part can be decomposed into inputs and outputs, the factor set include two parts of technology in detail. Four factors can be explained by several indicators that measure the factors. The first factor is *innovativeness* which is measured by using R&D intensity and innovation level. R&D intensity is very useful to examine the innovativeness because R&D investment can boost innovation of both product and process. In addition, the innovation level means how early a company introduces its product to a market, indicating that an innovative company can deploy its outputs very early. The second factor is *appropriateness* of innovation that is achieved from innovative activities. In order to possess competitive edge, SMEs should protect their technology and knowledge from other competitors. Thus, the level of appropriateness of hidden champions is analyzed by investigating the degree that they possess intellectual property. Third, *market initiative* is a critical factor to develop a new market and extend an existing market into an extra market. Therefore, this research examines the degree of global marketing and how much they conduct product innovation for the purpose of escalating their market share. Finally, the fourth factor is *globalization* which enables hidden champions to collaborate other companies, university, suppliers, customers and so on. In this paper, the degree how much hidden champions collaborate with global partners is investigated to analyze the level of utilizing the global network. Table I summarizes the four factors, describing the detailed variables.

Table 1: Factors to Analyze the Characteristics of Hidden Champions

Factors	Indicators
Innovativeness	R&D Intensity(%), Innovation Level(5-Likert scale)
Appropriateness	Patent Application(Count), Degree of Intellectual Property(5-Likert scale)
Market Initiative	Degree of Global Marketing(5-Likert scale), New Market Creation(Count)
Globalization	Global Collaboration(%), Global Information Collection(Count)

Hypotheses:

The proposed four factors are utilized to compare the features of hidden champions. In this paper, two different analyses are conducted to examine the detailed characteristics of such SMEs as mentioned before. First, hidden champions and non-hidden champions are compared with the four factors. In general, the technological innovation of hidden champions is emphasized and they tend to protect their technology as a form of intellectual property. In comparison with non-global leading SMEs, global leading SMEs reinforce global distribution channels, marketing, and promotion [10]. In addition, the kind of SMEs have global network that can facilitate the collaboration with global companies. Thus, this paper forms four hypotheses as follows.

H1-1: The innovativeness of hidden champions is higher than that of non-hidden champions.

H1-2: The appropriateness of hidden champions is higher than that of non-hidden champions.

H1-3: The market initiative of hidden champions is higher than that of non-hidden champions.

H1-4: The degree of globalization that hidden champions construct is higher than that of non-hidden champions.

Second, born hidden champions have superior competences in terms of technological innovation, marketing and networking. If a company tries to be an export-oriented company from the time of establishment by investing considerable R&D budgets, the company seems to be based on high technological innovation with qualified global network and sophisticate market initiatives. Thus, similar to the first group of hypotheses, four hypotheses are formulated by reflecting the differences of born-hidden champions and acquired hidden champions in various perspectives of innovativeness, appropriateness, market initiative and globalization.

H2-1: The innovativeness of born hidden champions is higher than that of acquired hidden champions.

H2-2: The appropriateness of born hidden champions is higher than that of acquired hidden champions.

H2-3: The market initiative of born hidden champions is higher than that of acquired hidden champions.

H2-4: The degree of globalization that born hidden champions construct is higher than that of acquired hidden champions.

Results:

Comparisons of Hidden Champions and Non-Hidden Champions:

This paper analyzes the differences of two types of SMEs in terms of four factors by testing the

suggested hypotheses with statistical methodologies such as t-test analysis. Since the scale of each indicator is interval scale or ratio scale, t-test can be applied to show the differences among company groups. Five indicators such as R&D intensity, patent application, new market creation, global collaboration and global information collection have counts or percentage values. On the contrary, different indicators including innovation level, degree of intellectual property and degree of global marketing are measured by 5-Likert scales, meaning that those indicators are interval scales. Table 2 shows that although two hypotheses (H1-3, H1-4) are statistically supported, different two hypotheses (H1-1 and H1-2) are not supported through the statistical analysis. First, hidden champions do not significantly spend more R&D expenditures than non-hidden champions. In addition, there is not a significant difference between two types of SMEs in the number of patent application. However, in terms of market initiative and globalization, hidden champions have higher values than non-hidden champions. Therefore, from the innovation survey, while hidden champions do not stick to a technology-oriented strategy, they have a tendency to focus on a market and collaboration-oriented strategy. Normally, hidden champions have a tendency that they do not invest huge investment on R&D and apply their innovative outputs to patents, opened intellectual property. Since they should not be conspicuous in a hidden area among the intensive competition, they do not intentionally have to inform their technological competitiveness. However, hidden champions need to spend a lot of resources to achieve a strong global market position with broad global network. Thus, they successfully utilize the advantage of open innovation and normally take a demand-pull approach to develop a product and service.

Table 2: Results of the first four hypotheses

Factors		p-value
Innovativeness	R&D Intensity	0.400
	Innovation Level	0.371
Appropriateness	Patent Application	0.061
	Degree of Intellectual Property	0.071
Market Initiative	Degree of Global Marketing	0.039*
	New Market Creation	0.000*
Globalization	Global Collaboration	0.000*
	Global Information Collection	0.018*
Note: the symbol (*) means that p-value is meaningful at the significant level of 95%.		

Comparisons of Born-Hidden Champions and Acquired Hidden Champions:

For the advanced analysis, this research defines two types of hidden champions: born hidden champions and acquired hidden champions. Basically, since a born hidden champion tends to target global markets innately, it can have unique characteristics that let it distinguishable from acquired hidden champions. First of all, born-hidden champions can be described as technological innovators and active patent applicants because the differences between two types exist, being supported through t-test analysis. They concentrate on the development of new technology on the basis of technological capability, emphasizing the protection of technological innovation. In particular, they have strong relationship with global companies and universities. However, in terms of market initiative, two types of hidden champions have no differences because the market initiative is a critical factor which can distinguish hidden champions from non-hidden champions. Table 3 depicts the results of analysis according to types of hidden champions.

As a result, born hidden champions show better results than non-hidden champions in market initiative and global network, and born-hidden champions have superiority in innovativeness, appropriateness and global network in comparison with acquired hidden champions. Even though no significant results are derived in the statistical analysis on the market initiative factor, the average value of born hidden champion is higher than that of acquired hidden champion. Therefore, born-hidden champions can have higher values than non-hidden champions in four factors.

Table 3: Results of the second four hypotheses

Factors		p-value
Innovativeness	R&D Intensity	0.000*
	Innovation Level	0.027*
Appropriateness	Patent Application	0.000*
	Degree of Intellectual Property	0.052

Market Initiative	Degree of Global Marketing	0.084
	New Market Creation	0.172
Globalization	Global Collaboration	0.007*
	Global Information Collection	0.044*
Note: the symbol (*) means that p-value is meaningful at the significant level of 95%.		

Discussions:

Several findings can be recognized from two types of analyses. First, hidden champions generally stick to market-oriented strategies. Since they pursue a market pull strategy rather than technology push approach, 'market initiative' and 'globalization' factors are very important to the innovation activities of hidden champions. Traditional arguments on the selection of innovation strategy between the market pull and technology push have existed to discuss the characteristics of specific industries or companies. In the case of hidden champions, their success factors are summarized as market-oriented and global strategies with technological competitiveness posterior. Moreover, they sometimes hide their superior technology in order to be hidden in a niche market. Second, in spite of the market-oriented strategy of hidden champions, born hidden champions put emphasis on the technological innovation. Since the companies target the global markets with highly developed technology and potential market opportunities, they naturally have to possess the high level of technological competence. When they are compared with acquired hidden champions, the differences of R&D intensity and innovation level are conspicuous. Third, in terms of market initiatives, since global marketing and new market creation are a general mission of hidden champions, most of them try to explore global new markets. Thus, although the differences between hidden champions and normal SMEs exist in the comparison analysis, the differences between born hidden champions and acquired hidden champions are not statically supported. Fourth, when it comes to the globalization factor, the nature of hidden champions focuses on the export of products or services, the level of globalization is generally high among them. Thus, the globalization of hidden champions is implemented better than normal SMEs. However, interestingly, the globalization of born hidden champions is higher than that of acquired hidden champions. Many researchers might think that since most of hidden champions pursue the globalization approach, the differences between two types of hidden champions do not exist. However, the statistical results show that born hidden champions perform the global-oriented strategy from the beginning of establishment. Therefore, the level of globalization is naturally higher in comparison with acquired hidden champions. The born hidden champions generate a strong global collaboration and information collection channel. Thus, if a company wants to be a born hidden champion, it should consider these results.

Conclusions:

The importance to find hidden champions has been emphasized because the analysis about their success story can provide ample information for policy makers who play a role in supporting SMEs. In the perspective of national innovation system (NIS), since a policy that intensively bolsters large companies might be irrelevant in this turbulent environment and a global era, the role of SMEs should be highlighted. Even if a few studies deal with the definition of hidden champions and the identification of success factors of them qualitatively, the quantitative approach was not conducted. Thus, this paper tackles the analysis of hidden champions with quantitative innovation survey data, defining the types of hidden champions. Consequently, in general, hidden champions emphasize the influence of market initiative and global network. Additionally, born hidden champions which focus on export to global market based on technological capability from the establishment retain high level of technological innovativeness and a lot of patents compared to acquired hidden champions. The results will be helpful to devise a support program of governments. In addition, companies can plan an effective strategy to derive their competitiveness.

However, this paper has some limitations with regards to data, methods and so on. First, the survey data were collected in 2005 from manufacturing companies. Thus, up-to-date data of manufacturing and service companies should be analyzed to secure the validity of analysis. This can provide the comparison of hidden champions between manufacturing firms and service firms. Second, the criterion which derives hidden champions is different from Herman Simon's approach due to the constraint of data since CIS data do not have the information which should be provided in order to evaluate whether a company can be included in his criterion. Thus, CIS data need to be combined with other data source that can complement to the CIS data. Third, more factors such as top managers and culture of a company were not analyzed to investigate various aspects of hidden champions. Therefore, in order to sort out the aforementioned limitations, diverse future research can be studies to conduct the more detailed and important investigation of hidden champions.

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References

1. Albaum, G., J. Standskov and D. Edwin, 1998. International marketing and Export Management. Addison Wesley Lonman Ltd: London.
2. Darbanhosseiniamirkhiz, M and W.K.W. Ismail, 2012. Advanced Manufacturing Technology Adoption in SMEs: an Integrative Model. Journal of Technology Management and Innovation, 7(4): 112-120.
3. Didonet, S.R. and G. Díaz, 2012. Supply Chain Management Practices as a Support to Innovation in SMEs. Journal of Technology Management and Innovation, 7(3): 91-109.
4. Edwards, T., R. Delbridge and M. Munday, 2005. Understanding innovation in small and medium-sized enterprises: a process manifest. Technovation, 25: 1119-1120.
5. Fraser, J., and J. Oppenheim, 1997. What's new about globalization? The McKinsey Quarterly, 2: 168-179.
6. Hoffman, K., M. Parejo, J. Bessant and L. Perren, 1998. Small firms R&D, technology and innovation in the UK: a literature review. Technovation, 18(1): 39-55.
7. Ji, Y., and J. Kim, 2003. Case study on the characteristics and outcomes of Korean global venture firms. Seogang Management Reviews, 14(2): 443-457.
8. Jones, O., and F. Tilley, 2003. Competitive Advantage in SMEs: organizing for Innovation and Change. Wiley: Chichester.
9. Jung, J., 2008. Effects of resources and global strategic process on the international growth. International Management Review, 12(2): 25-53.
10. Keng, K.A., and T.S. Jiuan, 1989. Differences between small and medium sized exporting and nonexporting firms: nature or nurture. International Marketing Review, 6(4): 27-40.
11. Kleinknecht, A., and J.O.N. Reijnen, 1992. Why do firms co-operate on R&D? An empirical study. Research Policy, 21: 347-360.
12. Lee, C., 2001. The Effects of Export of Export Marketing Mix Strategies on Export Performance : An Experience of Korea. Research on International Management, 12(2): 21-24.
13. Lee, Y., 1997. Causality analysis of economic growth and export of SMEs: Comparison with large companies. Research on SMEs, 19(2): 345-364.
14. Lichtenthaler, U., 2005. External commercialization of knowledge: review and research agenda. International Journal of Management Reviews, 7: 231-255.
15. Marques, C.S., and J. Ferreira, 2009. SME Innovative Capacity, Competitive Advantage and Performance in a 'Traditional' Industrial Region of Portugal, Journal of Technology Management and Innovation, 4(4): 53-68.
16. Shaw, E., 1998. Social networks: their impact on the innovative behaviour of small service firms. International Journal of Innovation Management, 2(2): 201-222.
17. Yoon, B and S. Lee, 2011. Innovation of Hidden Champions: Analysis of Innovation Survey. Proceeding of The 2011 International Conference on Asia Pacific Business Innovation & Technology Management (APBITM), January 23-25, Bali, Indonesia.