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The role of innovation in creating a competitive advantage

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ABSTRACT

This study examined the innovation that leads to a competitive advantage in the frozen food business in the context of small-sized and medium-sized enterprises (SMEs). The research process consisted of three parts: 1) a literature study; 2) an empirical research study using questionnaires as a data collection tool; and 3) an analysis and conclusion of the research results using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM). The findings showed that innovation enhanced the advantages in competition via external factors. These external factors were divided into two groups: micro-oriented factors and macro-oriented factors. The external factors at the micro level had more influence on the innovation development of the frozen food businesses than those at the macro level. The results showed that entrepreneurs, especially SME entrepreneurs, need to adapt and readily prepare themselves to face upcoming economic changes, which are about to occur not only at the global level but also at the regional and the country levels. In addition to the internal contexts within the organization, external factors are also important, especially those that will lead to the development of innovation. Innovation will become the strategic tool in this important competition for the improvement, creation, and enhancement of business to create competitive advantages equal to or better than those in foreign countries in order to realize sustainable development.

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Introduction

Small- and medium-sized enterprises (SMEs) play an important role in the economic and social development of a country. The roles of SMEs are reflected in the creation of jobs and income, and improved trade balance and are the main mechanisms in revitalizing and enhancing national economic advancement via income generation and job creation. In addition, SMEs are the starting point of development into an industry. Most large companies at present developed from SMEs (Oduntan, 2014; Robu, 2013). SMEs are a major type of company, accounting for 95–99 percent

of all businesses, with additional job creation totalling more than 60–70 percent (The Organization for Economic Co-operation and Development [OECD], 2016). In 2015 in Asia, SMEs accounted for 96 percent of the total enterprises and created more than 50–85 percent of the total employment positions within each Asian country. In addition, SMEs accounted for a large proportion of the GDP within their respective countries, ranging from 30 to 53 percent, while 19–31 percent of the goods exported by each Asian country came from SMEs (ASEAN Secretariat, 2015). Therefore, SMEs in ASEAN are clearly not only important for job and income creation but are also an economic pillar of ASEAN. In the first quarter of 2017 in Thailand, the GDP of SMEs was 4.9 percent higher than in the previous quarter, having increased by 4.3 percent in the previous year, while the national GDP had expanded by only 3.3 percent. The proportional Thai GDP increased from 42.2 percent in 2016 to

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42.5 percent in 2017, a difference of more than THB 1.61 million ([The Office of SMEs Promotion, 2017](#)).

At present, SMEs have become the link between macroeconomics and microeconomics (similar to the human spine, which is the nerve center of the body). The economy of a country grows steadily and sustainably as SMEs continually develop. Governments in many countries have national policies to support and promote SMEs in order to increase the competitive potential of the country. For example, Thailand has mandated a plan to promote SMEs from 2017 to 2021 that includes an increase in the growth rate of SMEs, especially in the food industry, which is seen as the main factor in human sustainability. Based on the trends in global food consumption, which give rise to changes in the types of food consumed, changes in the lifestyles of consumers in various sectors will change accordingly. These trends will especially foster the growth of the frozen food industry, which arises from the transformation of raw materials into high-quality goods with added value that are easy to prepare and consume, that lengthen people's lives, and that can be preserved for a long time. The creation of higher added value can be found in the processing industries, such as the canned food industry, the dairy industry, and the frozen food industry. The frozen food processing industry at the SME level is grouped into the processing industry, which in Thailand had a national GDP in 2014 of THB 3,644,648 million, or 27.7 percent of the total GDP of the country. The SME portion of this GDP is valued at THB 1,226,531 million, or 33.7 percent of the total processing industry's GDP contribution ([The Office of SMEs Promotion, 2016](#)).

According to survey results in the past few years, consumers have paid more attention to healthy ratios or amounts of food and are concerned with freshness, cleanliness, and production standards in addition to convenience, comfort, and taste. Therefore, many producers are more interested in exploring this aspect of the market seriously and are preparing to develop ready-to-eat, healthy, frozen food in boxes or smart meals. Food products in the smart meal group, including smart diets, smart health food, smart veggies, and smart soup, are being introduced to respond to the needs of those consumers who place more and more importance on healthy food. This market has a high potential for growth. However, SMEs still face many problems, such as competition from within and outside the country ([Research Center of Kasikorn Bank, 2017](#); [The Office of SMEs Promotion, 2017](#)). The key to increasing the capacity and creating a competitive advantage for SMEs is innovation ([Plessis, 2007](#)). [Virameteeikul \(2011\)](#) stated that innovation can create sustainable growth that leads to competitive advantages in both internal and external markets. Therefore, this research focused on the aspects of innovation that lead to competitive advantages in the frozen food industry in the context of SMEs.

Literature Review

Factors Affecting Innovation

Innovation and new ideas come from factors within and outside an organization ([Chen, Duan, Edward, & Lehaney,](#)

[2006](#); [Chong, Chong, & Gan, 2011](#)). In terms of internal factors, thoughts, new ideas, and innovation come from the transfer of knowledge among employees, regardless of whether they work in the same department ([Argote & Ingram, 2000](#); [Distanont, Haapasalo, Rassameethes, & Lin, 2012](#)). Apart from that, innovation and new ideas that come from outside the organization are also important ([Blonder & Pritzl, 1992](#); [Distanont et al., 2012](#); [Hamel, Doz, & Prahalad, 1989](#); [Littler, Leverick, & Bruce, 1995](#); [Millson, Raj, & Wilemon, 1992](#)). Several researchers have found that new knowledge, viewpoints, and ideas from outside one's own organization give rise to more innovations than from within companies ([Hillebrand & Biemans, 2004](#); [Littler et al., 1995](#)). The transfer of knowledge between organizations comes in the form of downstream transfer, such as the transfer of knowledge between businesses and customers. Upstream knowledge transfer refers to the transfer of knowledge between businesses and suppliers, universities, or other organizations. The transfer of knowledge between an organization and outside agencies is a horizontal transfer—the transfer of knowledge between a business and its competitors for the purpose of new product development or innovative development, which ultimately leads to improved business performance and competitive advantage. [Distanont \(2018\)](#) discovered that outside factors that influence the innovation of SMEs can be classified into two groups: outside factors at the micro level, which are market-oriented (customers, suppliers, and the industry), and outside factors at the macro level, which have an international context. This study's scope is the outside factors at both the micro level (customers, suppliers, and the industry) and the macro level (international context) that influence the innovation of SMEs.

1) Market Orientation

- 1.1) *Customers*: A review of several research papers found that input from customers leads to the creation of business innovation through important factors such as the receipt of information pertaining to the company's products and services and a good relationship with customers, which fosters new ideas and viewpoints in the development of products and services ([Asomaning & Abdulai, 2015](#); [Ekanayake & Abeysinghe, 2010](#); [Rakthin, Calantone, & Wang, 2016](#)).
- 1.2) *Suppliers*: [Distanont et al. \(2012\)](#) revealed that the transfer of knowledge between suppliers and companies is an important factor in the development of new products and services. The exchange of knowledge and the introduction of new ideas and recommendations for new raw materials or other suggestions useful for the development of new production processes and products can all lead to the creation of innovation ([Hoegl & Wagner, 2005](#); [Primo & Amundson, 2002](#); [Rosell & Lakemond, 2012](#)).
- 1.3) *Industry*: Competitive components are another important factor in the creation of innovations ([Asomaning & Abdulai, 2015](#); [Narver & Slater, 1990](#)). Pressure from the industry or competitors in the

market is especially powerful in this regard, be it in the development of new products for the market, the continuing improvement of the production process, or even the introduction of new applications for technologies. These are all pressures that threaten other industries that cannot stand on their own but are prepared to face the challenges, change, and continually develop (Tseng, Tan, & Siriban-Manalang, 2013). Christensen (1997), who developed the disruptive technology theory, has discussed the birth of destructive innovation and implied that large companies that control the market tend to face problems when coming up with new inventions because they fall into a success trap. At the same time, if there is continuously high competition in the industry among equal-sized businesses, the opportunity to develop new innovations will be higher. In addition to other pressures from within the industry that encourage businesses to reinvent innovations, the exchange of data and information and cooperation in joint research and development in the industry are further aspects that lead to new knowledge and innovation in an organization (Inauen & Schenker, 2011).

Hypothesis 1. Market orientation has a significant influence on innovations (see Figure 1).

2) *International Context:* Certain agents of the government sector fund and support the research and development of products, new production processes, and technology transfer to SMEs to enhance their knowledge and help them with the development of production processes and marketing, among other things (Nurul & Abd, 2016). Others implement various rules and regulations that serve as important factors in enforcing businesses to develop innovations—the governments of various countries have employed such measures (Zhang & Zhu,

2015). The government's proclamation of various policies in particular leads to innovation. A study by Patanakul and Pinto (2014) showed that government policy that fosters the development of business results in organizational changes and increased innovational output. In addition, the government can promote innovation by enacting laws that enhance innovation or promote international business.

Hypothesis 2. International context has a significant influence on innovation (see Figure 1).

Innovation and Creation of Competitive Advantage

Innovation has been studied for quite some time, but because of the differences in the viewpoints and backgrounds of each individual researcher, no definition that is generally well accepted can be constructed. In the past, Schumpeter (1949) defined innovation as similar to new directions in exploiting the existing resources of a business for new things such as new products, new production methods, new suppliers or sources of raw materials, the utilization of new markets, and new methods in business management. Evan (1966) defined innovation as a process of developing new ideas. Drucker (1994) stated that innovation is an important tool of the entrepreneur in creating competitive potential in business and wealth by utilizing existing resources or by creating new ones, including development using new knowledge. Damanpour (1987) defined innovations as new things developed for use in an organization that are well received by personnel within the organization. Freeman and Soete (1997) stated that an innovation is a new product or process that has been improved and used commercially for the first time. From the several definitions above, this research determined the definition of innovation as “a new thing different from what already exists that has been developed using existing knowledge and that responds to the needs of the market.”

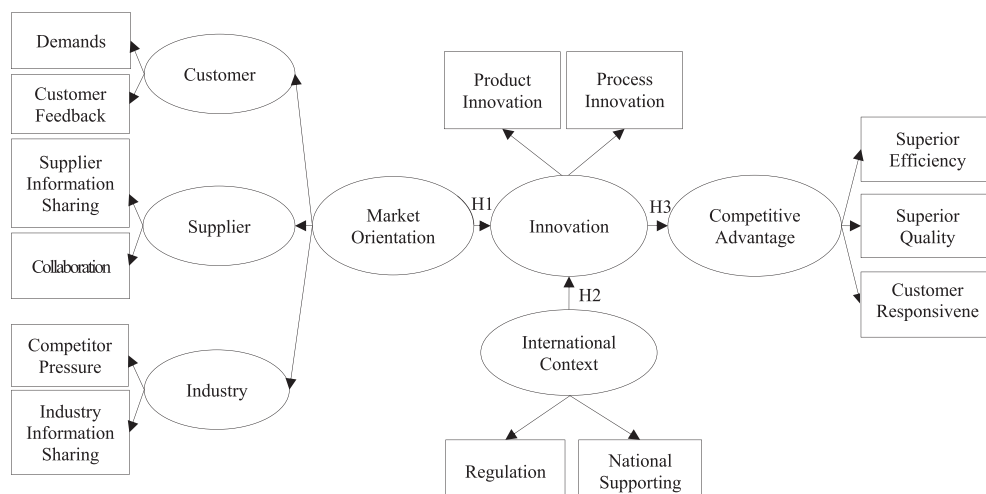


Figure 1 Research model and hypotheses

In addition, innovations have been classified into several forms, largely divided into the following: 1) target of the innovation (product innovation and process innovation); 2) degree of change (radical innovation and incremental innovation); and 3) area of impact (technological innovation and administrative innovation) (Bessant & Tidd, 2007; Schilling, 2008; Smith, 2006). The current research paper classifies innovations into two groups—product innovation and process innovation—and examines them within the frozen food industry at the SME level.

At present, innovation is an important factor in several aspects of business competition. Innovation enables businesses to present new or improved products to the market before their competitors and thus increase their market share. Several organizations have been successful and thrive because of innovation, which creates competitive advantages for them (Goksoy, Vayvay, & Ergeneli, 2013; Lim, Chesbrough, & Ruan, 2010). Innovation is a strategy that companies use to create a competitive advantage, producing things that nobody else can, doing things better than everyone else, or introducing superior, cheaper, and faster services (Aziz & Samad, 2016). This strategy enables the organization to create long-term competition by gathering knowledge, skills in technology, and experience in creativity and development and introducing new ideas in the form of product innovation, process innovation, or business model innovation. This not only has positive results for the organization but also fosters the growth of the entire national economy (Abbing, 2010; Cottam, Ensor, & Band, 2001). The competitive advantages can result from goods and services that exhibit outstanding differences from the typical products in the respective domain or that have a lower cost than those of the competitors (Porter, 1998). In addition, Porter (1998) stated that components of competitive advantage originate from the ability of a business to maximize the efficiency of its production process, to develop superior quality goods and services, and to develop services to which customers respond with high satisfaction rates.

Hypothesis 3. Innovation has a significant influence on competitive advantage (Figure 1).

Methods

This study adopted a quantitative methodology using a questionnaire as a tool in data collection. Statistical techniques were used to analyze the survey data to test the hypotheses. These techniques included exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM). The population used in this study was 279 SMEs in the frozen food industry registered as SMEs with The Office of SMEs Promotion. The sample was selected via purposive sampling from SMEs located in central Thailand, totaling 155 SMEs. This group is the largest group of SMEs in the Thai frozen food industry, accounting for 56 percent. Additionally, the majority of frozen food companies in central Thailand are already equipped with high-tech machinery in the food processing and working processes. The determination of the sample size was based on sustainability in terms of the principle of SEM. According to the literature review and related studies,

the ideal sample size for the principle of SEM should include more samples than variables—at least 200 samples (Merchant, Li, Karpinski, & Rumrill, 2013). Therefore, this research used purposive sampling, collecting data from 155 SMEs. The informants were high-level administrators who were experts in administration. The data were collected via questionnaires: four were administered in each SME (620 questionnaires in total). Of these, 500 sets, or 80.65 percent, were returned.

Results and Discussion

The questionnaire was validated using an Index of Item Objective Congruence (IOC) and the reliability was tested using Cronbach's Alpha. The number obtained from the IOC, from three experts in the organization, showed the IOC to be higher than 0.5. Then, the reliability was tested using a pilot test with a group possessing qualifications similar to the samples. In total, 30 sets of questionnaires were tested and the Cronbach's Alpha value was .980.

The results of factor analysis from EFA were based on the criteria: 1) the eigen value of each factor must be above 1, and 2) factor loading must be higher than 0.5. The objective in the stage of survey factor analysis is to identify the relationships of factors that affect the performance of technology transfer. Additionally, survey factor analysis was used with the principal component analysis method (which is the most acceptable option for extracting the main component) and the varimax rotation method with consideration of the statistics KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy), approximate chi-square, total variance explained and significance (Sig) as shown in Table 1.

After that, the results from EFA analysis were used to analyze the structural equation model (SEM) which was used to assess the overall research model, which is presented in Figure 2. The results of the research model suggest that the overall fit of the model with the data was good (CMIN/df = 1.738, GFI = 0.991, AGFI = 0.958, RMSEA = 0.038) (Table 2). These values were consistent with empirical data, and when they were analyzed using the model, as shown in Figure 2, the p-value was significant at .001 (***), .01 (**), and .05 (*). The results of the linear structural relationship test among parameters in the model through path analysis can be used to conclude the relationship among parameters as presented in Figure 2 and Table 3.

Table 1
Results of EFA analysis

Factor	KMO (>0.5)	Approx. Chi-Square	Total Variance Explained (>65)	Df	Sig.
Customer	0.527	1249.763	79.842	6	.000
Supplier	0.804	1571.298	78.443	6	.000
Industry	0.618	1925.806	87.536	10	.000
International Context	0.552	342.373	72.708	6	.000
Innovation	0.768	2440.516	83.017	15	.000
Competitive Advantage	0.634	3507.623	77.676	21	.000

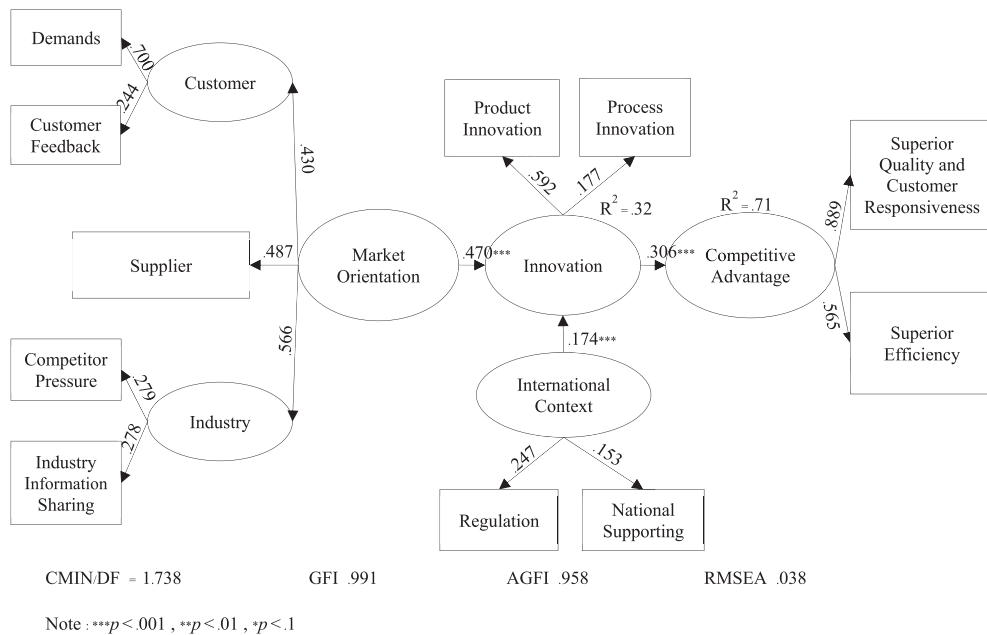


Figure 2 Relationship between innovation and competitive advantage

CMIN/df is the minimum sample discrepancy function divided by the degrees of freedom. This index is described as a measure of fit. The index is a relative chi-square statistic for which values lower than a threshold (3.0) indicate an acceptable fit between the model and the dataset (Hair, Black, Babin, Anderson, & Tatham, 2006).

GFI is the goodness-of-fit index, which indicates the proportion of the observed covariances explained by the model-implied covariances. GFI should be ≥ 0.9 for the model to be accepted (Hair et al., 2006).

AGFI is the adjusted goodness-of-fit index. This adjustment is to cater for the phenomenon of the SEM, whereby a more complex models fit the same data better than simpler models. AGFI should be ≥ 0.9 for the model to be accepted (Hair et al., 2006).

RMSEA is the root mean square error of approximation. There is good model fit if RMSEA is ≤ 0.05 (Hair et al., 2006).

As shown in Figure 2, the market orientation and the international context had a significant positive influence on innovation (parameter estimates = 0.470 and 0.174, respectively). Additionally, innovation had a significant positive relationship with competitive advantage (parameter estimate = 0.306). The results showed that market orientation and international context, which are external factors that influence innovation, accounted for 32 percent

($R^2 = 0.32$) of competitive advantages created and that innovation was responsible for up to 71 percent ($R^2 = 0.71$) of the competitive advantages in the frozen food industry at the SME level.

The research results showed that external factors at the micro level (market orientation) influenced the development of SME innovation more than external factors at the macro level (international context). The most important

Table 2 Goodness-of-fit-indices and measure

Measurement indices	Recommended value	Value
CMIN/df	<3	1.738 (acceptable)
GFI	≥ 0.9	0.991 (acceptable)
AGFI	≥ 0.9	0.958 (acceptable)
RMSEA	≤ 0.05	0.38 (acceptable)

Table 3 Parameter results

Hypothesis	Parameter	Standardized	p
1	Innovation <- Market Orientation	0.470	.000
2	Innovation <- International Context	0.174	.000
3	Competitive Advantage <- Innovation	0.306	.000
4	Customer <- Market Orientation	0.430	.000
5	Supplier <- Market Orientation	0.487	.000
6	Industry <- Market Orientation	0.566	.000
7	Demand <- Customer	0.700	.000
8	Customer Feedback <- Customer	0.244	.000
9	Competitor Pressure <- Industry	0.279	.000
10	Industry Information Sharing <- Industry	0.278	.000
11	Product Innovation <- Innovation	0.592	.000
12	Process Innovation <- Innovation	0.177	.000
13	Regulation <- International Context	0.247	.000
14	National Supporting <- International Context	0.153	.000
15	Superior Quality And Customer Responsiveness <- Competitive Advantage	0.889	.000
16	Superior Efficiency <- Competitive Advantage	0.565	.000

component of market orientation was the industry. The influence of competitors who can introduce new goods and services into the market results in other companies in the frozen food business following suit. In addition, the exchanges of data between organizations in the development of new products and processes induces other companies to improve their production processes or goods in order to be competitive. In addition to industry, suppliers are another important component. SMEs, which are small companies, do not have much bargaining power, and therefore exchanging data and working with suppliers is a good strategy; in the frozen food industry at the SME level, most innovation comes in the form of products and production process innovations, and the data and knowledge of suppliers about raw materials and packaging is beneficial for businesses in helping them improve and develop variations of their products and in keeping their prices competitive. Customers are another important component to which the frozen food industry must pay attention—especially customer feedback on products. These data can lead to improvements and the development of new products and processes within the company. Moreover, enhancing innovation through a frozen foods association or a business network is necessary for SME in the frozen food industry. A frozen foods association can share good, useful information among members, for example trends, emerging markets, and information for improving operational processes.

Additionally, external factors at the macro level (in the international context) were also important, especially the laws and regulations of both the home country and of foreign countries all of which the business needs to follow for the sake of standards and occupational health. These requirements are constraints that force companies to improve and develop both products and production processes to meet international standards, ultimately leading to innovation in the frozen food industry. The role of innovation is an important key that leads to the creation of competitive advantages for businesses, and thus the frozen food industry must pay attention to the creation of innovation, especially external skills, knowledge, and experiences, which can foster innovation and lead to the creation of competitive advantages. For example, businesses can develop products or production processes that are superior in quality to those of competitors on the market and that respond to the needs of customers, which can help the businesses continually maintain good relations with customers and control all processes throughout the value chain startup from input to production to distribution, such that maximum efficiency and effectiveness can be achieved and maintained.

Conclusion and Recommendation

The objective of this study was to study the innovation factors that lead to the creation of competitive advantages in the frozen food industry at the SME level. The results showed that external factors that lead to innovation come in two forms. At the micro level, there is market orientation, which consists of customers, suppliers, and the industry, and at the macro level there is

the international context, which consists of regulations and national support. The research results showed that leaders of SMEs need to adjust and be ready to face economic changes occurring globally, regionally, and locally. In addition, they need to adapt to these changes. Innovation is an important weapon that can be used to improve and strengthen a business so that it can create competitive advantages equal to or greater than those of foreign businesses and thereby realize sustainable economic development. This research has only examined the context of the frozen food industry at the SME level. In the future, a comparative study between small-scale and large-scale frozen food companies should be conducted to build an in-depth understanding of the conformity, similarity, and contrast of business development at different levels. Such a study would enhance understanding of the total picture thoroughly and could be used to pave the way for the development of the frozen food industry in Thailand.

Conflict of interest

There is no conflict of interest.

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