การยกระดับความสามารถในการส่งออกในช่วงวิกฤตโรคระบาดของผลิตภัณฑ์อาหารแปรรูปแช่แข็งผ่านโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออก

ENHANCING CAPABILITIES OF FROZEN PROCESSED FOOD EXPORTING ENTREPRENEURS DURING THE EPIDEMIC CRISIS THROUGH THE EASTERN ECONOMIC CORRIDOR DEVELOPMENT PROJECT

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บทคัดย่อ

การยกระดับความสามารถในการส่งออกของผลิตภัณฑ์อาหารแปรรูปแช่แข็งในช่วงวิกฤตโรคระบาด จากการจัดการความเสี่ยง บนโซ่คุณค่า และความได้เปรียบทางการแข่งขัน เป็นแนวคิดที่เพิ่มประสิทธิภาพการส่งออก โดยเฉพาะในเขตโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออก ซึ่งมีสถานประกอบการอย่างหนาแน่น การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษา 1) อิทธิพลของโซ่มูลค่าที่ส่งผลต่อประสิทธิภาพในการส่งออกของอาหารแปรรูปแช่แข็งผ่านโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออก 2) อิทธิพลของโซ่มูลค่าที่ส่งผลต่อประสิทธิภาพในการส่งออกของอาหารแปรรูปแช่แข็งผ่านโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออกโดยมีความได้เปรียบในการแข่งขันเป็นตัวแปรคั่นกลาง 3) อิทธิพลของความเสี่ยงที่ส่งผลต่อประสิทธิภาพในการส่งออกผลิตภัณฑ์อาหารแปรรูปแช่แข็งผ่านโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออก และ 4) อิทธิพลของความเสี่ยงที่ส่งผลต่อประสิทธิภาพในการส่งออกผลิตภัณฑ์อาหารแปรรูปแช่แข็งผ่านโครงการพัฒนาระเบียงเศรษฐกิจพิเศษภาคตะวันออกโดยมีความได้เปรียบในการแข่งขันเป็นตัวแปรคั่นกลาง การวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณ มีกลุ่มตัวอย่าง คือ ผู้ประกอบการอาหารแปรรูปแช่แข็ง จำนวน 400 บริษัท ใช้การสุ่มตัวอย่างแบบหลายขั้นตอน ขนาดของกลุ่มอย่างใช้เกณฑ์ 20 เท่า ของตัวแปรสังเกตได้ เก็บรวบรวมข้อมูลแบบสอบถาม และวิเคราะห์ข้อมูลด้วยแบบจำลองสมการโครงสร้าง ผลการวิจัยพบว่า 1) โซ่มูลค่ามีอิทธิพลทางตรงเชิงบวกต่อความได้เปรียบในการแข่งขันอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 2) โซ่คุณค่ามีอิทธิพลทางอ้อมต่อประสิทธิภาพในการส่งออก

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ผลิตภัณฑ์อาหารแปรรูปแช่แข็งผ่านความได้เปรียบในการแข่งขันอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 3) การจัดการความเสี่ยงมีอิทธิพลทางตรงเชิงบวกต่อประสิทธิภาพในการส่งออกผลิตภัณฑ์อาหารแปรรูปแช่แข็งอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 และ 4) การจัดการความเสี่ยงมีอิทธิพลทางอ้อมเชิงบวกต่อประสิทธิภาพในการส่งออกผลิตภัณฑ์อาหารแปรรูปแช่แข็งโดยมีความได้เปรียบในการแข่งขันเป็นตัวแปรคั่นกลาง อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ผลการวิจัยครั้งนี้ สามารถเป็นแนวทางในการกำหนดนโยบายหน่วยงานที่เกี่ยวข้องทั้งภาครัฐและเอกชน รวมทั้งนำไปปรับใช้กลยุทธ์การจัดการความเสี่ยง ผ่านโซ่คุณค่าและความได้เปรียบทางการแข่งขัน เพื่อยกระดับการส่งออกของธุรกิจอาหารแปรรูปแช่แข็งภายในประเทศ

คำสำคัญ: ความสามารถการส่งออก วิกฤตโรคระบาด อาหารแปรรูปแช่แข็ง

Abstract

Enhancing export capabilities of frozen processed food during the pandemic by applying risk management based on value chains and competitive advantage is a concept that optimizes export in the Eastern Economic Corridor Development Project with a large number of enterprises. The objectives of this research were to study 1) the influence of value chains on the export efficiency of frozen processed food through the Eastern Economic Corridor development project, 2) the influence of value chains on export of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable, 3) the influence of risks affecting export efficiency of frozen processed food through the Eastern Economic Corridor Development Project, and 4) the influence of risks affecting export efficiency of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable. This is a quantitative research with 400 frozen food entrepreneurs as the sample group. Multistage sampling was utilized. The size of the group is 20 times of the observed variable. Questionnaires were used to collect data, and a structural equation model was used to analyze the collected data. The results showed that 1) value chain had a positive direct influence on competitive advantage at a significance level of .001, 2) value chain had an indirect influence on export efficiency of frozen processed food through competitive advantage at a significance level at .05, 3) risk management had a positive direct influence on the export efficiency of frozen processed food at a significance level at .001, and 4) risk management had a positive indirect influence on the export efficiency of frozen processed food with competitive advantage as a mediating variable at a significance level at .05 (Chi-Square/df=.820, df=35, p-value=.764, AGFI=.969, GFI=.991, CFI=1.000, RMR=005, RMSEA=.000). The results of this research can be used as a guideline to impose policies in public and private sectors, as well as to apply risk management strategies through the value chain and competitive advantage to enhance the export of frozen processed food business in Thailand.

Keywords: Export Capability, Pandemic, Frozen Processed Food

Introduction

Seafood industry is known as the most complex and regulated supply chain. However, the COVID-19 outbreak has speeded at unprecedented levels and caused the entire world to halt due to the fact that the demand in all sectors has declined. In 2019, frozen and processed seafood of Thailand had a total market amount of 1,188,523 tons. Domestic consumption accounted for 22%, while export goods accounted for 78% with approximately 173,961.78 million baht in value, or 2.28% of all Thai exports (Nation Broadcasting Corporation, 2020).

Thailand is considered as a high-potential food producer with modern production technology, international standard quality, on-time delivery, product responsibility, and varieties of products that meets the needs of the market. Thailand's key export markets are the United States (21.4%), Japan (20.7%), China (6.3%), and Australia (5.4%) respectively. The top five export products are 1) canned tuna and canned sardines, 2) pet food made from tuna, 3) shrimps, 4) squids, and 5) fish (Petchlum, 2019). The export trend of frozen processed food is likely to continuously expand due to significant strengths of Thai seafood industry, such as international standard production quality, the ability to adapt in both production and export to meet the quality, and standards required by the regulations of importing countries. The details of fresh, chilled, frozen, canned, and processed seafood are shown in Table 1.

Table 1 Details of fresh, chilled, frozen, canned, and processed seafood

Products	Value: Million (USD)		Expansion rate		Proportion
	2561 (Jan-Dec)	2562 (Jan)	2561 (Jan-Dec)	2562 (Jan)	2562 (Jan)
Fresh, chilled, frozen, canned, and processed seafood (Excluding fresh, chilled shrimp frozen and processed)	4,545.62	353.73	8.64	-2.66	100.00
1. Canned tuna	2,263.64	178.76	9.55	-3.28	50.54
2. Processed fish (tuna + other fish)	325.09	24.59	2.72	5.54	6.95
3. Other canned seafood	243.78	24.55	24.51	20.94	6.94
4. Live, chilled, and frozen squid	331.01	21.67	-4.36	-24.55	6.13
5. Fresh, chilled, and frozen fillet	258.00	20.60	3.50	10.99	5.82
6. Canned shrimps	246.08	16.65	-6.05	-9.36	4.71
7. Other shrimps	106.66	13.68	33.73	52.51	3.87
8. Canned sardine	143.12	12.32	32.13	15.14	3.48
9. Fresh, chilled, and frozen fish	176.44	12.05	-8.27	-22.86	3.41
10. Boiled chilled shrimps	158.48	6.14	160.96	-38.48	1.74

Source: Petchlum ((2019

Seafood and fishery industry was one of the first businesses economically affected by the COVID-19 outbreak due to Wuhan's Huanan Seafood Wholesale Market and the Chinese government's restrictions on seafood to prevent the outbreak. The restrictions greatly impacted consumption and production relevant to seafood and fishery industry since China alone accounted for 62% of global aquaculture production. In addition, foreign markets were also affected by the pandemic outbreak due to the greatly reduced demand in restaurants and other food businesses. Suppliers find it difficult due to limited access to logistics as a result of the COVID-19 movement restrictions. Thus, it is necessary that seafood producers realize the benefits of trading networks and control the entire supply chain by delivering their products directly to consumers, which can reduce cost while increasing the profit margin. In other words, entrepreneurs can obtain benefits in the form of reduced costs, new markets access, predictable demand, and the ability to bring a direct-to-consumer model to ensure that the seafood is fresh from the sea.

Eastern Economic Corridor or EEC is considered a channel that allow Thailand to reveal its potential in the form of economic structure revolutionization and competitiveness with policies to attract foreign investment in large industries by integrating cyber networks, real-world production, internet of things (IoT) that are beneficial in production lines and exports in the frozen food processing industry. In fact, Thai entrepreneurs are encouraged to use food technology to upgrade the quality and add value to their processed seafood products, and create a network to connect businesses in the production chain between entrepreneurs in order to integrate innovations to create new processed products to the market. In addition, the government also promotes Food Valley by developing an area to be a source of comprehensive food production city. In order to develop business models for entrepreneurs to export processed food and compete with other countries, it is necessary to study “Enhancing export capabilities of frozen processed food during pandemic through the Eastern Economic Corridor Development Project”.

Objectives

1. To study the influence of value chains on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project,
2. To study the influence of value chains on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable,
3. To study the influence of risks affecting export efficiency of frozen processed food through the Eastern Economic Corridor Development Project, and
4. To study the influence of risks affecting export efficiency of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable.

Conceptual Framework

According to the concepts of risk management (Kiser & Cantrell, 2006; Thun & Hocnig, 2011: Mei Dana et al., 2011), supply chain management (Lambert, D. M., Stock, J.R., & Ellran, L.M. (1998), and competitive advantages (Martín-de-Castro, Gregorio, et al., 2006) that affect export capability enhancement of frozen processed food during the pandemic, the conceptual framework of this study is illustrated as in Figure 1.

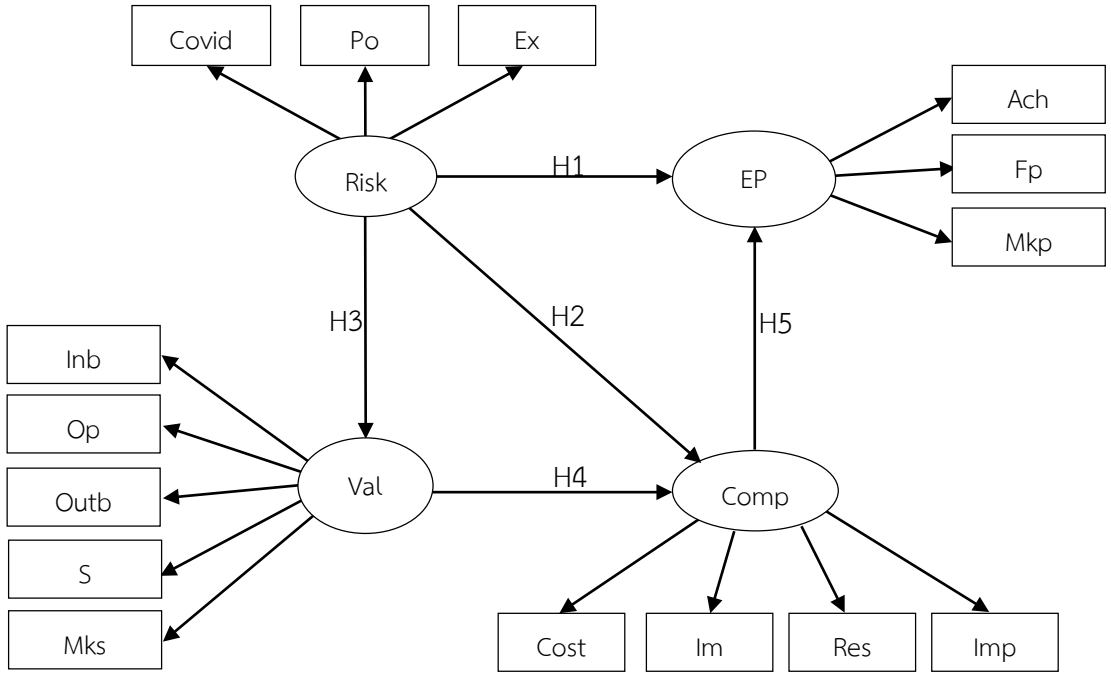


Figure 1 Conceptual Framework

Hypotheses

H1: Risk management influences the export efficiency of frozen processed foods.

H2: Risk management influences the competitive advantage of frozen processed food.

H3: Risk management influences the value chain.

H4: Value chains influence the competitive advantage of frozen processed food.

H5: Competitive advantage influences the export efficiency of frozen processed foods.

H6: Risk management influences the export efficiency of frozen processed food through value chains and competitive advantage.

Literature Review

Risk management is a systematic process of strategy formulation to identify events that may cause risks and damages to individuals or organizations. The selection of risk management methods and the implementation of alternative methods have been used to

reduce, eliminate risks, and manage risks. Supply chain risk management is essential, which helps organizations to be aware of risks arising from external and internal factors. In addition, supply chain management or logistics network is the integration of systems of agencies, people, technology, activities, information and resources to move goods or services from suppliers to customers. The supply chain activities transform natural resources, raw materials, and other materials into finished goods, and deliver them to end customers. Additionally, Lambert and Enz (2017, pp.3 -4), who studied the advancement and potential of supply chain management in the areas of cross-function in order to add value, found that supply chain management is based on relationship management (Dyer & Singh, 1998, Piercy, N., (2009). Managing corporate relationships can lead to a competitive advantage by connecting consumer relationship with supplier relationship management. Thus, the relationship management between consumers and suppliers is considered a part of the development for structuring critical business relationships in the form of collaboration (Varoutsa and Scapens, 2015). Besides enhancing operational capabilities beyond logistics and supply chain operations, there are also factors involved in optimizing performance, especially competitive advantages that make them more different and stronger than their competitors. Moreover, Porter (1985) and Barney (1991) indicated that success in operations creates a competitive advantage. In summary, organizations can gain competitive advantages with differentiation, cost advantage, niche market focus, and prompt response. In terms of competitive advantage, businesses need to increase their capabilities and operations to differentiate themselves from their competitors or outperform their competitors, and gain acceptance from consumers in the quality of products and services to build trust and recognition among Thai and international consumers.

Food cold chain is a business that increases the level of proper storage, management, and means of delivery in order to deliver quality products to consumers on time. A system with temperature-controlled environment is called a cold chain system, which keeps the products safe and fresh for consumers. In other words, cold chain system meets the needs of consumers in terms of quality and safety.

Unfortunately, the outbreak of the COVID-19, which is a new public health crisis, has threatened the world by causing severe acute respiratory syndrome (Suphan et al., 2020). Despite the fact that the Covid-19 spreads among people, it does not affect the quantity of raw materials, production, and export of seafood products of Thailand (Turakit, 2021). However, other several industrial sectors are quickly and severely affected. It is vital that all stakeholders be aware of the problem and find solutions in order to survive since all industries are important variables in driving Thai economy (Saenyen et al., 2020).

Research Methodology

This quantitative research concentrated on the data collected from manufacturers and distributors in the frozen food processing industry for export.

Population and Samples

The population in this research were frozen food processors for export, a total of 2,269 companies registered with the Ministry of Commerce. The samples in this research were frozen processed food for export producers. The sample size was based on 20-time criteria suggested by Hair et al (1995). The total number of parameters in this study consisted of 15 parameters, or 300 samples. For data loss prevention, 35% of questionnaires were added. Thus, the total sample size was 405, and the sample size applied in this study was 400 samples. Multi-stage random sampling was utilized by determining the population in the frozen food processing industry. The allocation of the sample size by the terrain layer was also used (Niyangkoon, 2005). Stratified random sampling was applied to provide the population an equal chance of being chosen (National Statistical Office, 2012). A simple random sampling method was used by collecting data from an executive and a worker per a company.

Data Collection and Analysis

To collect data, 400 sets of questionnaires were sent on an online platform, and on telephone.

To analyze the collected data, descriptive statistics, including percentage, mean, and standard deviation: S.D. were used. Moreover, inference statistics, such as correlation coefficient, regression, and structurer equation model were also used.

Research Results

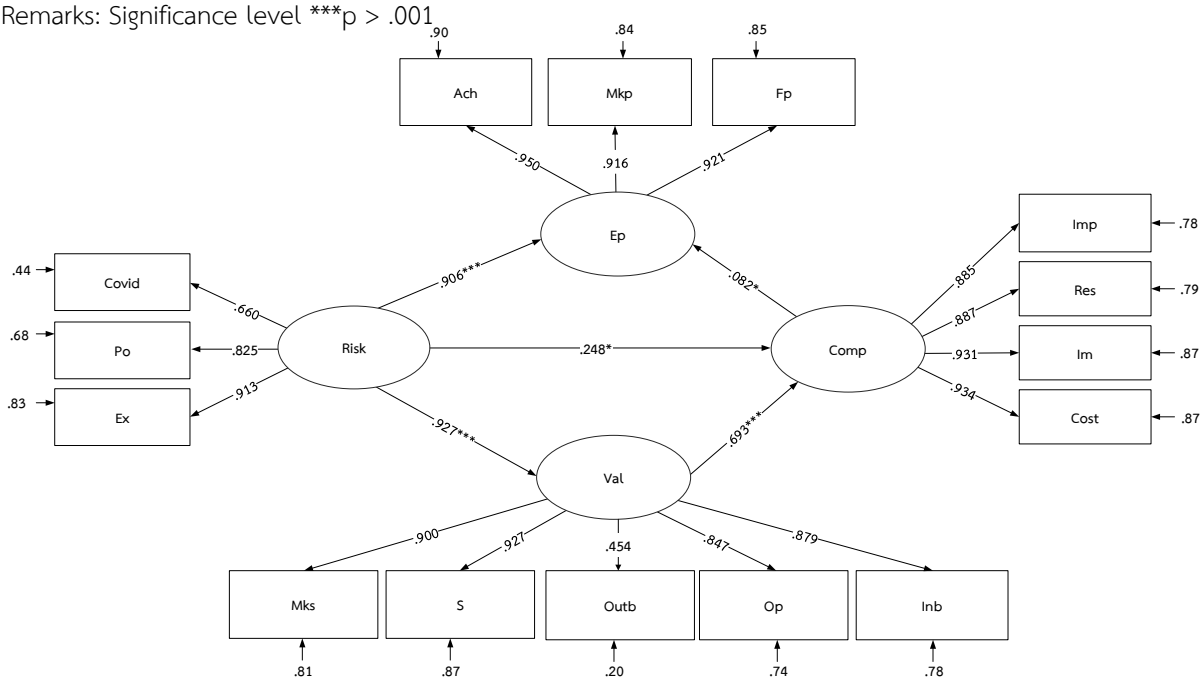
1. The results of coherence of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project. Table 2 Confirms component analysis results of export capability enhancement.

Table 2 shows the results of confirmation component analysis of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project. The model conformity index was obtained as follows: χ^2 = 67.153, χ^2/df = 1.178, df = 57, p-value = .168, AGFI = .956, GFI = .979, CFI = .999, RMR = .007, RMSEA = .021. The conformity index meets the specified criteria: χ^2/df = 1.178 which is lower than 2 while RMSEA, RMR, and SRMR index are lower than .05. GFI, AGFI, NFI, and TLI indexes are more than .95. Thus, export capability enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project consist of 4 components: Risk, Val, Comp, and Ep. Risk was measured by 3 observable variables: Ex, Covid, and Po. Val was measured by 5 observable variables: S, Mks, Outb, Op, and Inb. Comp was measured by 4 observable variables: Im, Imp, Res, and Cost. Ep was measured by 3 observable variables: Ach, Mkp, and Fp. The results of the causal factor model analysis of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project are shown in Figure 2.

Table 2 Causal factor model analysis of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project

Latent variables	Risk			Val			Comp			Ep			r^2
observable variables	β	*b*	S.E.	β	*b*	S.E.	β	*b*	S.E.	β	*b*	S.E.	
Ex	.918***	1.000	-	-	-	-	-	-	-	-	-	-	.843
Covid	.682***	.907	.055	-	-	-	-	-	-	-	-	-	.466
Po	.832***	.958	.040	-	-	-	-	-	-	-	-	-	.693
S	-	-	-	.911***	1.000	-	-	-	-	-	-	-	.830
Mks	-	-	-	.902***	.987	.034	-	-	-	-	-	-	.813
Outb	-	-	-	.496***	.663	.056	-	-	-	-	-	-	.246
Op	-	-	-	.863***	.973	.038	-	-	-	-	-	-	.745
Inb	-	-	-	.900***	.993	.035	-	-	-	-	-	-	.811
Im	-	-	-	-	-	-	.936***	1.000	-	-	-	-	.877
Imp	-	-	-	-	-	-	.881***	.938	.032	-	-	-	.776
Res	-	-	-	-	-	-	.896***	.974	.032	-	-	-	.803
Cost	-	-	-	-	-	-	.922***	.966	.028	-	-	-	.851
Ach	-	-	-	-	-	-	-	-	-	.885***	1.000	-	.784
Mkp	-	-	-	-	-	-	-	-	-	.911***	.946	.034	.830
Fp	-	-	-	-	-	-	-	-	-	.918***	.983	.034	.843
χ^2 = 67.153, χ^2/df = 1.178, df = 57, p-value = .168, AGFI = .956, GFI = .979, CFI = .999, NFI =.991 TLI = .997, RMR = .007, RMSEA = .021													

Remarks: Significance level ***p > .001



χ^2 = 28.716, χ^2/df=.820, df=35, p-value=.764, AGFI=.969, GFI=.991, CFI=1.000, RMR=005, RMSEA=.000

Figure 2 Causal factor model analysis of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project

In Figure 2, the causal factor model of export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project shows that χ^2 = 28.716, df = 35, p-value = .764, which is more than .05. χ^2 /df = .820, which is less than 3.00. AGFI = .969, GFI = .991, CFI = 1.000, which is more than .95. RMSEA = 0.000, which is less than 0.05. RMR = 0.005, which is less than .05. They are consistent with the specified criteria at an acceptable level.

2. Results of the study on the export capacity enhancement of frozen processed food during the pandemic through the Eastern Economic Corridor Development Project

Table 3 Direct effect, indirect effect, and the total effect between independent and dependent variables

Dependent variables	**Val**			**Comp**			**Ep**		
Independent variables	**TE**	**DE**	**IE**	**TE**	**DE**	**IE**	**TE**	**DE**	**IE**
Risk	.927***	.927***	.000	.890*	.248*	.642*	.979***	.906***	.073*
Val	-	-	-	.693***	.693***	.000	.057*	.000	.057*
Comp	-	-	-	-	-	-	.082*	.082*	.000
EP	-	-	-	-	-	-	-	-	-
R - Square	.859			.860			.961		
χ^2 = 28.716, χ^2 /df=.820, df=35, p-value=.764, AGFI=.969, GFI=.991, CFI=1.000, RMR=005, RMSEA=.000									

Remarks: TE = Total Effect, DE = Direct effect, IE = Indirect effect.

Significance level at 0.01 (p < .01), * Significance level at 0.001 (p < .001)

Table 3 shows that

1) χ^2 = 28.716, df = 35, p-value = 0.764, which is more than 0.05. χ^2 /df = 0.820, which is less than 3.00. AGFI = .969, GFI = 0.991, and CFI = 1.000, which is more than 0.95. RMSEA = 0.000, which is less than 0.05. RMR = 0.005, which is less than 0.05. They are consistent with the specified criteria at an acceptable level. The highest value of positive direct effect of export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project was risk management (Risk) (DE = .906) with the significance level at 001., followed by competitive advantage (Comp) (DE = .082) with the significance level at 0.5, while chain value (Val) had no positive effect. This can also explain the variance in export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project at 96.1%.

2) Risk management (Risk) had a positive direct effect on competitive advantage (Comp) (DE = .248) with the significance level at0. 5. Value chain (Val) also had a positive direct effect on competitive advantage (Comp) (DE = .693) with the significance level at0. 01. This can also explain the covariance to competitive advantage (Comp) by 86.0%.

3) Risk management (Risk) had a positive direct effect on value chain (Val) (DE = .927) with the significance level at 0.01 which explain the covariance to value chain (Val) at 85.9%.

4) Factors that were not found to have a positive direct effect export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project were value chains (Val).

5) Risk management (Risk) had an indirectly effect on export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project (Ep) through competitive advantage (Comp). The indirect effect was (IE = .642) with the significance level at 0.5.

6) Risk management (Risk) had an indirectly effect on export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project (Ep) through value chain (Val) and competitive advantage (Comp) with an indirect effect (IE = .057, .000) at the significance level of .05.

Table 4 Hypothesis test results

Hypotheses	Path Analysis	Path coefficient	t	P - Value	Results
H1	Risk ---> Ep	.906	9.559	***	Accepted
H2	Risk ---> Comp	.248	2.433	.015*	Accepted
H3	Risk ---> Val	.927	24.259	***	Accepted
H4	Val ---> Comp	.693	6.594	***	Accepted
H5	Comp ---> Ep	.082	2.208	.027*	Accepted
H6	Risk --> Val --> Comp --> Ep	-	-	.051*	Accepted

Remarks: *Significance level at 0.05 (p < .05), **Significance level at 0.01 (p < .01), ***Significance level at 0.001 (p < .001)

Table 4 shows the results as follows:

1) Risk management had a positive direct effect on export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project with the significance level at .001. Risk management affected competitive advantage (Comp) with the significance level at .05, and value chain (Val) with the significance level at .001. Thus, H1 – H3 were accepted.

2) Value chain (Val) had a positive direct effect on competitive advantage (Comp) with the significance level at .001. Thus, H4 was accepted.

3) Competitive advantage (Comp) had a positive direct effect on export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project with the significance level at .05. Thus, H5 was accepted.

4) Risk management (Risk) had a positive indirect effect on export capacity enhancement during the pandemic through the Eastern Economic Corridor Development Project through value chain (Val) and competitive advantage (Comp) with the significance level at .05. Thus, H6 was accepted.

Conclusion and Discussion

The causal model in this study was developed based on the empirical data, theoretical model, and conceptual model of risk management, value chain, and competitive advantage in order to study 1) the influence of value chains on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project, 2) the influence of value chains on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable, 3) the influence of risks on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project, and 4) the influence of risks on export efficiency of frozen processed food through the Eastern Economic Corridor Development Project with competitive advantage as a mediating variable. The three models were 96.1% reliable to forecast the export efficiency of frozen processed food through the Eastern Economic Corridor Development Project.

This is consistent with Khamsuk (2018), and Wang, M., Asian, S., Wood, L. C., & Wang, B. (2020), who indicated that innovation in logistics enhances logistics capabilities, and also reduces supply chain risks. It is important that the management plan strategies, policies and action plans to prevent subsequent risks. Moreover, Porter, M.E. and Miller, V.E. (1985) stated that value chain is a system that connects interdependent activities that affect cost or effectiveness in order to change to more appropriate activities. This is in line with De Waal, A., Orij, R., Rosman, J., & Zevenbergen, M. (2014), who indicated that value chain can be used to improve and increase the level of efficiency of the organization. Similarly, Escandon-Barbosa, D.,et al (2019) revealed that internal and external factors, such as innovation, market dynamics. and export business environment must be considered to determine the success of export. Monteiro, A. P., Soares, A. M., & Rua, O. L. (2019) also indicated that it is necessary to consider financial resources, access to resources, innovation, risk management, and dynamic ability to determine export performance. The reason is that dynamic capabilities demonstrate how tangible resources can be used to optimize exports by providing guidelines for

entrepreneurs to enhance their export efficiency by utilizing their available sources, connections in the international market, and export support policies. The findings reflected that export capacity enhancement of frozen processed food through the Eastern Economic Corridor Development Project during the pandemic were the results of risk management, value chain, and competitive advantage as mediating variables. This is in line with Imran, M., Hamid, S. N. B. A., & Aziz, A. (2018), and Lin, K. H., Huang, K. F., & Peng, Y. P. (2014), who discussed that to succeed in the international market and increase export efficiency, all resources must be integrated. Failure to manage all resources effectively may affect the performance of the international market. Furthermore, trust and social interactions have a positive effect on improving export efficiency. Exchange of information among exporters and trading partners indicates close relationships, trust, and social interaction, which leads to an access to information of international market and export capacity enhancement of frozen processed food through the Eastern Economic Corridor Development Project during the pandemic.

Suggestions

1. Government agencies and authorities involved in the frozen food processing industry should impose policies, and establish a main unit to work on enhancing export capabilities. The plan should include integrated action plans through the Eastern Economic Corridor Development Project in order to add value and increase competitive advantage of Thai frozen processed food.

2. In order to add value chain in the frozen food processing industry supply chain, the management should be adjusted to increase efficiency in exports based on risk management. The information technology to increase competitive advantage of the frozen food processing industry must be integrated in order to collect and store customer data from all channels of communication into the database system. In addition, the use of social media during the pandemic to enhance competitive advantage and spotlight the differentiation of a specific product or service to meet the demand of customer, and to satisfy them can lead to product loyalty.

Suggestions for Future Research

1. Factors of organizational culture that influence the performance of exporting frozen processed food should be further studied,

2. Factors of marketing communication in order to build relationships with customers in the frozen food processing industry supply chain should be further studied, and

3. Qualitative data to confirm and support more complete research in the area of frozen food processing industry supply chain should be further studied.

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