The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.15423685

FACTORS INFLUENCING THE SUSTAINABLE DEVELOPMENT OF SEAFOOD EXPORTS TO THE EU: EVIDENCE FROM VIETNAMESE ENTERPRISES

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Abstract

A combination of qualitative and quantitative methods are used. Survey data were collected from 218 samples and SmartPLS was applied to process the data. The results indicate that regulations on sustainable seafood export development, government support policies, commitments to sustainable development under the EVFTA, financial resources, and competitiveness all positively affect the sustainable development of seafood exports to the EU. Furthermore, the findings reveal no significant differences in the relationships among the factors based on export experience. However, significant differences are observed for some relationships based on the number of export markets, geographical location, and types of exported products. Based on these findings, some implications are proposed to enhance the Vietnamese seafood exports to the EU.

Keywords: EU, Export, Seafood, Sustainable Development.

JEL: F14, Q01, Q17.

1. INTRODUCTION

Vietnam is currently ranked third in seafood exports, following China and Norway. One of the major seafood export markets for Vietnam is the European Union (EU). Since 2016, the EU has been the second-largest market for Vietnam's agricultural and seafood exports. However, on October 23, 2017, the European Commission (EC) officially imposed a "yellow card" on Vietnam's wild-caught seafood due to violations of regulations regarding illegal, unreported, and unregulated (IUU) fishing.

Despite this, in 2017, 2018, and 2019, the EU continued to be the second-largest market for Vietnam’s agricultural and seafood exports. By 2020 and 2021, Vietnam's seafood exports to the EU dropped to third place (after the United States and Japan) (Ministry of Industry and Trade, 2021, 2022). By 2022, 2023, and 2024, seafood exports to the EU further declined, falling to fourth place, behind the United States, China, and Japan (Ministry of Industry and Trade, 2023 & authors' compilation).

Over the past decade (2014-2024), the average growth rate of Vietnam's seafood exports to the EU has decreased by 7.6%, and since 2022, exports to the EU market have fallen to fourth place. Additionally, the proportion of seafood export value to the EU market has been steadily

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ISSN 1533-9211
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decreasing. In 2014, the share of seafood exports to the EU accounted for 18%, but by 2024, this figure is expected to be nearly 10% op (calculated by the authors).

Therefore, research is needed to increase both the value and the proportion of Vietnam's seafood exports to the EU. The Vietnam-EU Free Trade Agreement (EVFTA), effective from August 1, 2020, provides opportunities for Vietnamese exporters. Moreover, the EU is the third-largest consumer market for agricultural, forestry, and seafood products in the world (the EU imports approximately over USD 300 billion worth of agricultural, forestry, and seafood products annually, including USD 190 billion in agricultural products, USD 50 billion in seafood, and USD 59 billion in wood and wood products) (Ngoc Thuy, 2024).

In addition, Vietnamese enterprises exporting seafood to the EU face the challenge of complying with regulations and technical standards related to food safety and traceability, including critical regulations such as IUU which require seafood products to have legal origins, be transparently recorded, and be environmentally sustainable. Furthermore, EU consumers increasingly prioritize sustainably certified products. In order to export seafood to the EU market, businesses must shift towards sustainable export practices to meet the demands of this market. Therefore, it is essential to make the research about the factors influencing the sustainable development of Vietnamese seafood exports to the EU.

2. THEORETICAL BASIS, LITERATURE REVIEW AND RESEARCH MODEL

2.1. Theoretical basis

Sustainable development

The first concept of sustainable development was given by the World Commission on Environment and Development (the Brundtland Commission) in 1987 which mentioned development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (WCED, 1987). According to Ion (2012), sustainable development requires simultaneously ensuring of economic development, environmental protection and social welfare, resulting interrelationship between the three pillars: social, economic, environmental.

Sustainable development of seafood exports

Based on the three components of sustainable development, sustainable development of seafood exports can be understood that it is not merely about promoting export growth but also requires meeting strict environmental, social, and economic criteria to ensure long-term development and avoid negative impacts.

According to Nguyen Thi Thu Hien (2017), one of the key factors in building sustainable seafood exports is the application of international certifications for environmental protection and food safety, such as MSC (Marine Stewardship Council) and ASC (Aquaculture Stewardship Council) certifications to ensure that exported products not only meet quality standards but also help protect marine ecosystems and natural resources.

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2.2. Literature review

Institutional theory

The Institutional Theory of DiMaggio and Powell (1983) focuses on how organizations and their behaviours are influenced by social and institutional factors. This theory emphasizes that institutional factors, considered as external factors, play a critical role in shaping organizations and determining how they develop and function within society. Based on institutional theory, it can be observed that seafood exporting businesses are directly affected by strict standards such as environmental protection, social responsibility, and food safety. These regulations can be seen as coercive pressures, as businesses are compelled to comply in order to maintain access to the market.

Resource-based view theory (RBV)

Wernerfelt (1984) asserts that the long-term success of an enterprise depends not only on seizing market opportunities but also on how effectively it utilizes and manages its internal resources. According to Barney (1991), an enterprise should assess whether a resource is valuable, rare, difficult to imitate, or substitutable. If resources, considered as internal factors of the enterprise, are well exploited, the enterprise will enhance its competitive advantage and performance. Sustainable seafood export to the EU requires businesses to develop and effectively leverage internal resources to meet market standards for environmental protection and food safety.

Some related empirical studies:

There are several related studies in Vietnam. Hong et al. (2017) conducted a study on Vietnam's fisheries and aquaculture development's policy: are exports performance targets sustainable?. The research result indicates that lack of a comprehensive attention to the need for sustainability and comprehensive action plans to increase Vietnam's seafood exports can have many negative impacts on the environment, the economy and society.

Many of these negative impacts are already affecting Vietnam's export performance, such as low value-added, weak reaction in the international market fluctuations, limitations in traceability, food safety issues and a lack of branding/eco-certification. Hoang et al. (2021) assess the influence of corporate social responsibility and Government environmental regulation on sustainable growth and development of Vietnamese seafood enterprises.

The results show that both social responsibility, government environmental regulation, and ecosystem innovation strategies have a statistically significant positive impact on enterprise sustainable business growth of Vietnamese seafood enterprises. At the same time, the ecosystem innovation strategies are fully mediating in the relationship between Government environmental regulation and enterprise sustainable business growth. Nguyen Thi Quynh Van and Lai Hong Minh (2022) provided an analysis of sustainable export development of Vietnam's seafood products in the context new generation FTA's towards 2030. It mentions the seafood industry in Vietnam also faces many challenges from fierce competition in the international market, as well as to meet increasingly strict regulations of importing countries,

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ISSN 1533-9211
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especially difficult markets such as the US, EU and Japan. New generation of FTAs (CPTPP, EVFTA) will open new opportunities in developing export markets with major countries, and at the same time come with great challenges for Vietnam's seafood exporters.

Not only they need to compete with other seafood enterprises in the domestic market, but also sustainable development of seafood exports will need to be set as a goal or an indispensable objective. Tran Thuy Linh and Do Duc Binh (2024) conducted a study on sustainable export practices to the EU, with a specific focus on the textile and garment sector. The research applied qualitative and quantitative methodologies. The findings revealed that external factors influencing sustainable textile and garment exports to the EU comprised four key elements: sustainable export regulations, the intensity of market competition, mass media influence, and rules of origin requirements. Meanwhile, internal factors included three main components: technological innovation capacity, human capital, and a humanistic organizational culture.

Abroad, some studies related to this topic include as follows. According to Tvaronavičienė et al. (2014), the study focused on sustainable development facets: exporting industrial sectors in Lithuania. The paper aims to reveal factors affecting patterns of development exporting companies attributed to industrial sector and its sub-sectors of Lithuanian economy.

Methodology of the investigation is based on development of theoretically grounded questionnaire, targeting revealing factors impacting international competitiveness of industrial companies. Impact of factors, attributed to external business environment, and role of factors attributed to internal development forces are to be indicated. Obtained results, is expected, and would allow to foresee trends and main drivers of further development of exporting Lithuanian industrial sectors.

Zeriti et al. (2014) using a sample of U.K. exporters, they find that various macro and microenvironmental factors are responsible for sustainable export marketing strategy adaptation, which shapes the nature of sustainable export marketing strategy fit and its export venture performance outcomes.

The results indicate that sustainable export marketing strategy adaptation is the outcome of the differences between home and export markets in terms of economic and technological conditions, competitive intensity, customer characteristics, and stakeholder pressures. Moreover, the performance relevance of sustainable export marketing strategy adaptation requires adequate fit with these macro- and microenvironmental factors.

Through the literature review of, to the best of our knowledge, further research is needed on the factors influencing the sustainable development of seafood exports to the EU.

2.3. Research models, hypotheses and scales

A review of relevant literature indicates that the factors influencing seafood exports to the EU can be categorized into enterprise's external and internal factors**.** Based on institutional theory, resource-based view theory, related empirical studies mentioned in 2.2 and Tran Thuy Linh and Do Duc Binh (2024)'s study, the research model is suggested as follows:

ISSN 1533-9211

DOI: 10.5281/zenodo.15423685

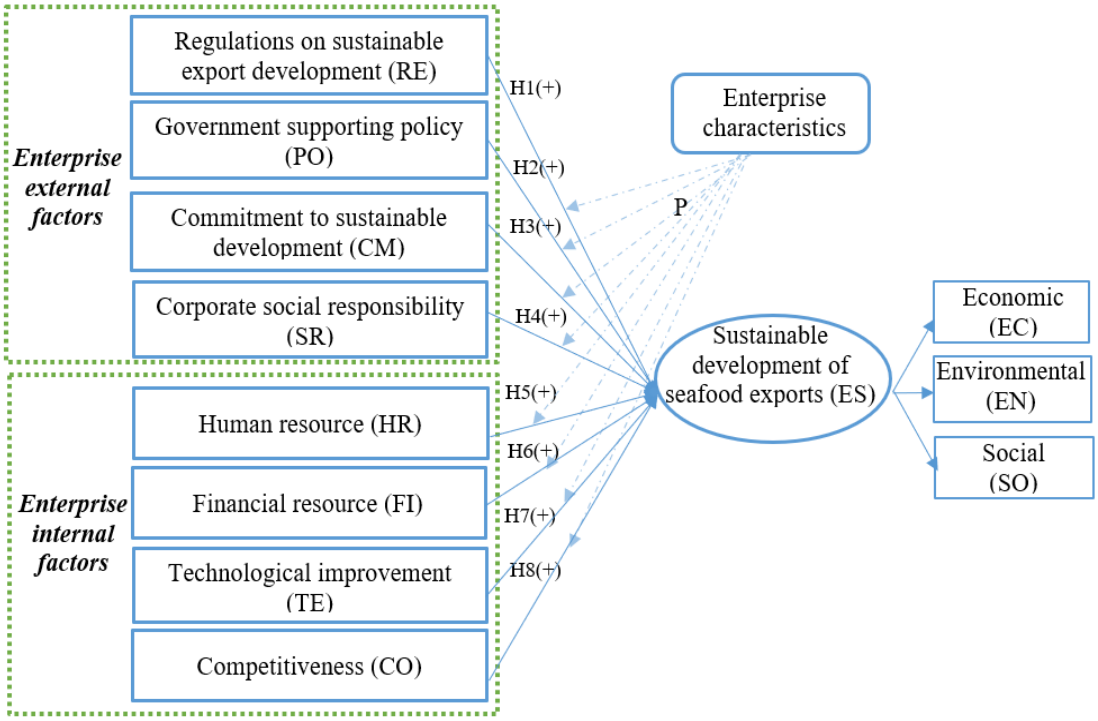

Figure 1: Proposed research model

Enterprise's external factors

Regulations on sustainable export development (RE)

From an institutional theory perspective, regulations regarding sustainable seafood export development are governed by governments, regional bodies, and importing countries through legislation and binding commitments. Developing countries face significant challenges in complying with these regulations (Gabriel et al., 2015). Notable regulatory requirements from both the exporting and importing countries which include those related to hygiene, quality and food safety, fisheries exploitation, environmental management, and traceability. These regulations create pressure that compels entrepreneurs to comply with environmental protection standards. Several studies have demonstrated the impact of regulations on sustainable seafood export development, such as those by Hoang Thi Minh Nguyet et al. (2021) and Tran Thuy Linh and Do Duc Binh (2024). Therefore, the following hypothesis is tested:

H1: Regulations on sustainable seafood export development have a positive impact on sustainable development of seafood exports

Government supporting policy (PO)

In the seafood industry, such policies may include tax incentives, credit support, trade promotion assistance, and customs procedure reforms (Quy et al., 2023). Each country designs policies aligned with its specific economic conditions to support sustainable development. In Vietnam, small and medium-sized enterprises (SMEs) account for 98% of all businesses. Due

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ISSN 1533-9211
DOI: 10.5281/zenodo.15423685

to their limited resources, SMEs require strong government support to sustain and grow their operations and to transition toward more sustainable practices to meet market demands. Numerous studies have demonstrated the impact of government support policies on sustainable development (Lamoureux et al., 2019; Do, 2021; Treepornjaroen et al., 2022;). Therefore, the following hypothesis is tested:

H2: Government supporting policy has a positive impact on sustainable development of seafood exports

Commitment to sustainable development in EVFTA (CM)

The EVFTA's commitments are strictly enforced and comprehensively cover a wide range of key aspects of international trade, particularly those related to compliance with regulations on environmental protection, sustainable exploitation and fishing practices, labour rights, and environmental safeguards (Dang Thi Phuong Hoa, 2022; Nguyen Dinh Dap, 2022). The impact of these commitments on sustainable export development has been empirically validated in the study by Tran Thuy Linh and Do Duc Binh (2024). Therefore, the following hypothesis is tested:

H3: Commitment to sustainable development in EVFTA has a positive impact on sustainable development of seafood exports

Corporate social responsibility (SR)

According to Sharma (2019), corporate social responsibility (CSR) involves the integration of social perspectives into business growth, as enterprises draw their human resources from society and thus have an obligation to give back. In the seafood industry, CSR initiatives help significantly reduce negative impacts on marine ecosystems, contributing to the protection of the environment and aquatic resources - critical factors for ensuring the long-term sustainability of seafood exports. Ngo & Ngo (2023) demonstrated the impact of CSR on the sustainable development of Vietnamese enterprises in general, while the study by Hoang et al. (2021) showed the positive influence of CSR on the sustainable development of businesses in Vietnam's seafood sector. Therefore, the following hypothesis is tested:

H4: Corporate social responsibility has a positive impact on sustainable development of seafood exports

Enterprise's internal factors

Human resources (HR)

Human resources represent the knowledge and skills of enterprise employees (Delić & Smajlović, 2014). The successful organizations consider their workforce as the biggest source of sustainable competitive advantage (Jusufi & Ramaj, 2020). Tran Thuy Linh and Do Duc Binh (2024) demonstrated the positive impact of this factor on the sustainable export development. Therefore, the following hypothesis is tested:

H5: Human resource has a positive impact on sustainable development of seafood exports

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Financial resource (FI)

Financial resources refer to the pool of capital that can be mobilized and allocated to meet the funding needs of production and business activities, as well as to pursue long-term strategic goals (Pham Thi Van Anh, 2020). Abundant financial resources enable firms to invest in production technologies, develop management systems that comply with international standards, and cover the costs associated with meeting environmental and traceability requirements under new-generation free trade agreements. Some studies have demonstrated the impact of financial resource on sustainable seafood export development, such as Jouffray et al. (2019); Hieu et al. (2024). Notably, in order to achieve such innovation capacity, enterprises must have sufficient financial resources. Therefore, the following hypothesis is tested:

H6: Financial resource has a positive impact on sustainable development of seafood exports

Technological improvement (TE)

Technological improvement is defined as the iterative exchange of technology across organizational boundaries to improve performance and generate new value for enterprises (Randhawa et al., 2016). In the seafood industry, technological innovation capacity is reflected in activities such as research and development (R&D), the application of technologies for product innovation and process improvement aimed at minimizing environmental impact, and enhancing management practices and traceability systems to meet increasingly stringent standards and regulations imposed by governments and importing countries. Studies by Rowan (2023) and Tran Thuy Linh and Do Duc Binh (2024) also highlight the positive influence of technological improvement on sustainable export development. Therefore, the following hypothesis is tested:

H7: Technological improvement has a positive impact on sustainable development of seafood exports

Competitiveness (CO)

According to Porter (2008), competitiveness is the ability to create products with unique technology processes to create high added value following customer needs, with low cost, high productivity to increase profits. According to FAO (2020), competition in seafood exports arises not only from price factors but also from compliance with sustainability standards. Therefore, the competitiveness of seafood exporting enterprises - encompassing innovation capacity, product quality, production technology, the ability to comply with international standards, and brand reputation which plays a pivotal role in ensuring sustainable export development. Previous studies have confirmed the relationship between competitiveness and sustainable development (Arifin, 2013; Gligor & Jurcut, 2014). Therefore, the following hypothesis is tested:

H8: Competitiveness has a positive impact on sustainable development of seafood exports

Differences in relationships in the research model based on enterprise's characteristics

According to Leonidou et al. (2002), assessing the differences in research outcomes across groups with varying firm characteristics, such as level of market involvement, experience, firm

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size, and other diverse forms of exporting enterprises is essential to determine how the strength of relationships varies across different samples. This provides a basis for proposing more comprehensive and targeted research implications for specific types of enterprises (Morin et al., 2015). Balasubramanian et al. (2020) also highlighted that variations in international market involvement and export scale among exporting firms lead to differences in sustainable export performance. Therefore, the following expectation is tested:

P: There are differences in the relationships in the research model based on enterprise's characteristics (export market, geographical location, export experience and export products)

3. RESEARCH METHODOLOGY

Method

This study applied a mixed method of qualitative and quantitative methods. The qualitative method was conducted through in-depth interviews with 4 experts who are at the management level in export seafood enterprises. After this step, the factors affecting the sustainable development of seafood exports in the research model are confirmed to be appropriate and the measurement scales have been adjusted to be suitable for the current research context. All scales are formed in Table 1. Next, the main survey was implemented online. The second step of the quantitative method was undertaken to assess measurement model, structural model and multi- group analysis.

Sample collection and statistical analysis

Survey samples are seafood export enterprises, locating in Ho Chi Minh City and provinces in the South of Vietnam. Because of time and resource limitations, the sample-taking method is convenience. PLS-SEM was applied to test hypotheses.

Scales

Dependable variable of sustainable development of seafood exports (ES) is the second-order construct. All independent variables are the first-order constructs. They are shown with some adjustments after the qualitative step in the table below:

Table 1: The research scales

Code	Variables	Source
Regulations on sustainable export development (RE)		
RE1	Legal regulations enhance the development of sustainable exports in conformity with the regulations of importing countries	Adjusted from Amara & Chen (2021)
RE2	Regulations of importing countries promote environmentally responsible and ethical behavior among enterprises	
RE3	Regulatory conformity with enterprises' future strategies acts as a driving force for sustainability development	
Government supporting policy (PO)		
PO1	We are supported to participate in social activities	Adjusted from Do (2021)
PO2	There are no difficulty in handling administrative procedures	
PO3	There are preferential tax policies in production and business activities	

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Code	Variables	Source
PO4	Accessing credit resources are supported by the Government easily	
Commitment to sustainable development (CM)		
CM1	We are committed to implementing international labor standards	Tran Thuy Linh and Do Duc Binh (2024)
CM2	We are committed to sustainable environmental and climate practices	
CM3	We are committed to complying with origin and traceability requirements	
Corporate social responsibility (SR)		
SR1	We cares deeply about the community	Nguyen & Nguyen (2023)
SR2	We are strongly concerned about environmental protection	
SR3	We are strongly concerned about customer rights	
SR4	We are actively engaged in social initiatives	
Human resource (HR)		
HR1	Our employees exhibit a high level of professionalism in their duties	Nguyen Thi Le et al. (2020)
HR2	Our employees are highly adaptable to changes in products, technology, and the work environment	
HR3	Our employees have high professional skills and are well-equipped to meet job demands	
Financial resource (FI)		
FI1	We maintain a strong financial base and have sufficient borrowing capacity to support stable business operations	Adjusted from Radzi et al. (2017)
FI2	We implement efficient accounting practices and employ a professional operations management system	
FI3	We effectively utilize public financial assistance and relevant subsidies	
FI4	We maintain close financial oversight to ensure adequate funding and manage financial resources with transparency and accountability	
Technological improvement (TE)		
TE1	We integrate automated machinery into its processing and manufacturing operations	Nguyen Thi Le et al. (2020)
TE2	We employ flexible machinery systems that support effective product innovation	
TE3	We utilize machinery and equipment that are designed for quick and flexible adjustments	
TE4	We are implementing a shift from manual labour tools to automated technologies	
Competiveness (CO)		
CO1	Our company is capable of managing all competitive threats from rivals	Adjusted from Nguyen Thi Le et al. (2020)
CO2	Our company can fulfill large orders as requested by customers	
CO3	Our company can deliver products tailored to customers' specific needs	
CO4	Our company can offer products at competitive market prices	
Sustainable development of seafood exports (ES)		
Economic sustainability (EC)		Adjusted from Tran Thuy Linh and Do Duc Binh (2024)
EC1	The scale and growth of our seafood exports to the EU have been steadily expanding	
EC2	The structure of our export markets and the range of seafood products we export to the EU have been steadily growing	
EC3	Our seafood exports to the EU play a role in promoting regional economic development	
Environmental sustainability (EN)		

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Code	Variables	Source
EN1	We have adopted waste treatment technologies in both aquaculture and seafood processing operations	
EN2	We consistently uses high percentage of renewable or eco-friendly materials in its production processes	
EN3	We manufacture a wide range of products that are certified for compliance with food safety and environmental protection standards	
Social sustainability (SO)		
SO1	Our seafood export activities create a significant number of stable employment opportunities for our workforce	
SO2	Our company strictly adheres to international labour standards (ILO) and safeguards the rights and welfare of our employees	
SO3	Our employees are satisfied with the workplace environment and the company's remuneration and benefits policies	

Source: Compiled by the authors

4. RESEARCH RESULTS

4.1. Sample characteristics

218 valid responses were collected. Information about the research samples is summarized in the table below.

Table 2: Characteristics of research samples

Sample characteristics		Number of samples	Percentage (%)
Number of markets	1->2	37	16.98
	3->5	66	30.28
	6->10	71	32.57
	Above 10	44	20.18
Geographical location	Hochiminh city	37	16.97
	The Southwest	175	80.28
	The Eastwest	6	2.75
Export experience	Below 5 years	20	9.17
	5->10 years	77	35.32
	Above 10 years	121	55.5
Exported products	Live seafood	1	0.46
	Processed seafood	86	39.45
	Variety of products	131	60.09

Source: Authors calculation

4.2. Evaluation of measurement model

To evaluate the measurement model, the following steps should be taken: *(1) evaluate the reliability; (2) evaluate the convergent validity; (3) evaluate the discriminant validity* (Hair et al., 2017). Measurement model in this research is evaluated as follows:

First, the second-order construct of ES is estimated**.** Applying the repeated indicator approach, the reliability, convergent validity, and discriminant validity of all indicators are valid.

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Second, the measurement model including the second-order construct of ES and all eight first-order constructs are estimated. The results show that all constructs meet reliability, convergent validity, and discriminant validity which are indicated in the table below:

Table 3: Measurement models result

Constructs	Variables	Reliability		Convergent validity		Discriminant validity (HTMT ratio)
		Cronbach's Alpha	Composite Reliability	Loadings	AVE	
RE	RE1	0.895	0.935	0.900	0.827	<1 (Yes)
	RE2			0.944		
	RE3			0.882		
PO	PO1	0.928	0.948	0.904	0.821	<1 (Yes)
	PO2			0.902		
	PO3			0.912		
	PO4			0.906		
CM	CM1	0.940	0.961	0.947	0.892	<1 (Yes)
	CM2			0.958		
	CM3			0.929		
SR	SR1	0.918	0.942	0.893	0.802	<1 (Yes)
	SR2			0.901		
	SR3			0.920		
	SR4			0.868		
HR	HR1	0.920	0.949	0.892	0.862	<1 (Yes)
	HR2			0.953		
	HR3			0.940		
FI	FI1	0.915	0.940	0.889	0.796	<1 (Yes)
	FI2			0.921		
	FI3			0.901		
	FI4			0.856		
TE	TE1	0.892	0.922	0.816	0.748	<1 (Yes)
	TE2			0.910		
	TE3			0.818		
	TE4			0.911		
CO	CO1	0.952	0.965	0.931	0.873	<1 (Yes)
	CO2			0.937		
	CO3			0.931		
	CO4			0.937		
ES	EC	0.922	0.935	0.837	0,618	<1 (Yes)
	EN			0.835		
	SO			0.842		

Source: Authors' data processed results

4.3. Evaluation of structural model

Structural model is measured based on the following criteria (Hair et al., 2017): Collinearity assessment between constructs; Structural model path coefficients; Coefficient of determination (R^2 value); Effect size (f^2); Blindfolding and Predictive relevance (Q^2); Effect size (q^2).

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Table 4: Results of structural model evaluation

Hypotheses	Relationships	VIF	Path Coefficients	Bootstrap	p-value	Results	f^2	q^2
H1 (+)	RE -> ES	1.166	0.312	[0.233; 0.400]	0.000	Accepted	0.34	0.089
H2 (+)	PO -> ES	1.242	0.468	[0.365; 0.540]	0.000	Accepted	0.408	0.177
H3 (+)	CM -> ES	1.090	0.173	[0.097; 0.248]	0.000	Accepted	0.082	0.03
H4 (+)	SR -> ES	1.463	0.056	[-0.038; 0.162]	0.246	Rejected	0.008	0.000
H5 (+)	HR -> ES	1.225	0.047	[-0.035; 0.133]	0.259	Rejected	0.005	0.0018
H6 (+)	FI -> ES	1.434	0.132	[0.045; 0.214]	0.003	Accepted	0.032	0.0124
H7 (+)	TE -> ES	1.055	0.057	[-0.038; 0.155]	0.590	Rejected	0.012	0.0018
H8 (+)	CO -> ES	1.303	0.145	[0.077; 0.233]	0.000	Accepted	0.115	0.016
R^2 = 0.701; Q^2 = 0.436								

Source: Authors' data processed results

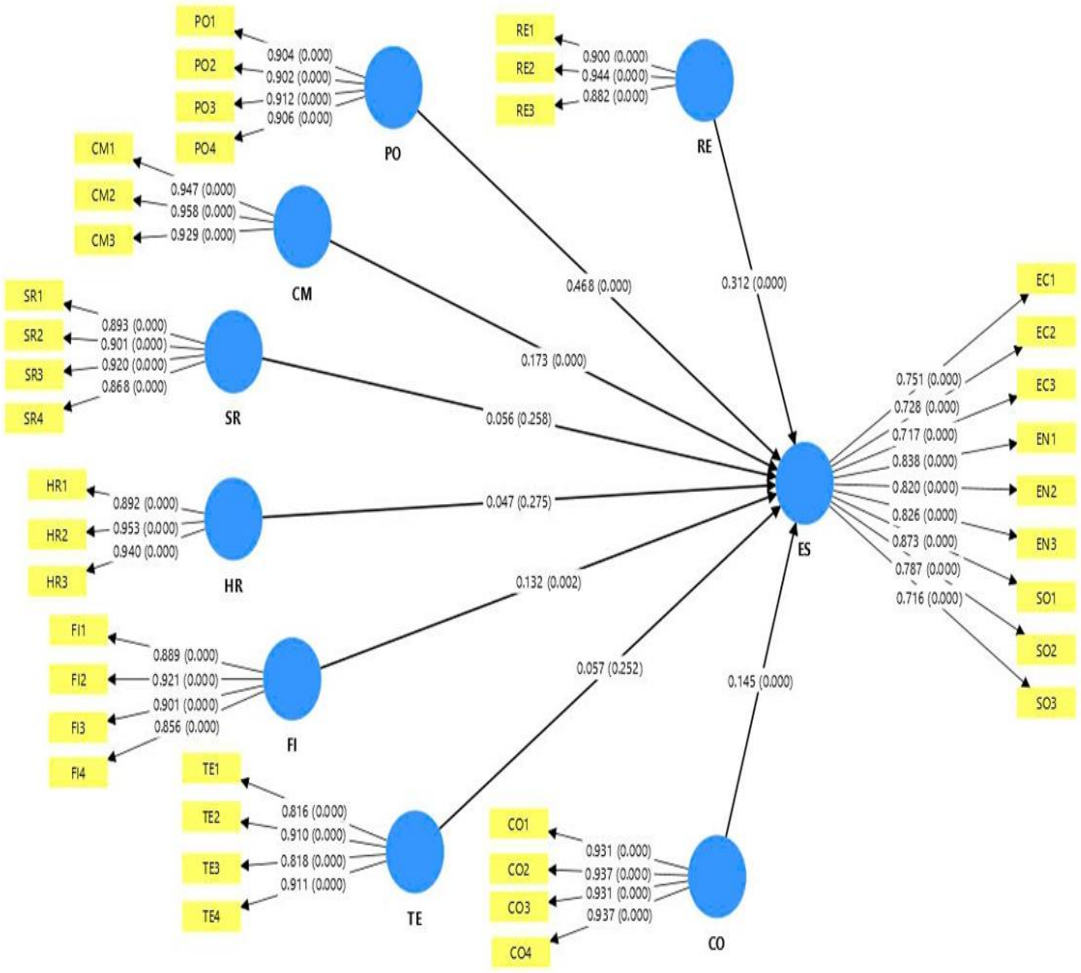

Figure 2: Structural model results

Source: Authors' data processed results

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Collinearity assessment

The results show that VIF values for the independent variables are below 5, indicating that, in line with Hair et al. (2017), the results obtained are not negatively affected by collinearity (Table 4).

Structural model path coefficients

The results show that five hypotheses are accepted, including H1, H2, H3, H6, H8; three hypotheses are rejected, including H4, H5, H7. The result of H1: Regulations on sustainable seafood export development have a positive impact on sustainable development of seafood exports which is consistent with Hoàng Thị Minh Nguyet et al. (2021). The result of H2: Government supporting policy has a positive impact on sustainable development of seafood exports which is consistent with some studies (Do, 2021; Treepornjaroen et al. (2022); Lamoureux et al. (2019). The result of H3: Commitment to sustainable development in EVFTA has a positive impact on sustainable development of seafood exports which is consistent with Tran Thuy Linh and Do Duc Binh (2024)'s study. The result of H6: Financial resource has a positive impact on sustainable development of seafood exports which is consistent with Jouffray et al. (2019); Hieu et al. (2024).

The result of H8: Competitiveness has a positive impact on sustainable development of seafood exports which is consistent with Arifin (2013); Gligor & Jurcut (2014). The result of H4 is rejected which means corporate social responsibility has not a positive impact on sustainable development of seafood exports which is consistent with Swartz (2019) showing current corporate social responsibility practices in the seafood industry may limit its ability to fully integrate sustainability throughout the supply chain. Sørensen (2011) also mentioned that corporate social responsibility has been insufficient to address the environmental and social issues in the Chilean salmon industry.

The result of H5 is rejected which means human resource has not a positive impact on sustainable development of seafood exports. This result is consistent with Nguyen (2020) discussing issues with human resource development which does not address the impact of human resources on sustainable seafood exports. The result of H7 is rejected which means technological improvement has not a positive impact on sustainable development of seafood exports. It is different from Rowan (2023) and Tran Thuy Linh and Do Duc Binh (2024). One possible reason for this disparity is that enterprises in the seafood industry may lack sufficient financial resources to invest in modern technology, which limits their ability to meet sustainable development standards (Shamsuzzoha, 2023).

Coefficient of determination (R^2 value)

This figure represents the amount of variance in the endogenous constructs explained by all the exogenous constructs linked to it, where values of 0.75 are considered to be substantial, 0.5 are moderate and 0.25 are weak (Hair et al., 2017). In our model, the R^2 coefficient (ES) is 0.701 so we can assess that this value is nearly substantial, and all undependable variables are accounted for 70.1 percent of the ES variations.

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Effect size (f^2)

The change in the R^2 value, when a specified exogenous construct is omitted from the model, can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs or not. f^2 are those values of 0.02, 0.15, and 0.35, respectively, representing small, medium, and large effects (Cohen, 1988) of the exogenous latent variable. Effect size values of less than 0.02 indicate that there is no effect. The result in Table 4 shows that

$f^2_{SR->ES}$=0.008; $f^2_{HR->ES}$=0.005 and $f^2_{TE->ES}$=0.012 which indicate that there are no effects of SR, HR and TE on ES

$f^2_{FI->ES}$=0.032 which shows the small effect of FI on ES.

$f^2_{CM->ES}$=0.082 and $f^2_{CO->ES}$= 0.115 which shows the nearly medium effects of CM and CO on ES.

$f^2_{RE->ES}$= 0.34 and $f^2_{PO->ES}$= 0.408 which shows the large effects of RE and PO on ES.

Blindfolding and Predictive relevance (Q^2)

In addition to evaluating the magnitude of R^2 values as a criterion of predictive accuracy, researchers should also examine Stone-Geisser's Q^2 value (Geisser, 1974). This measure is an indicator of the model's out-of-sample predictive power or predictive relevance. Q^2 values larger than 0 suggest that the model has predictive relevance for a certain endogenous construct. The result shows that the dependent constructs are higher than 0 for ES (Q^2=0.436) which supports the predictive capacity of our model.

Effect size (q^2)

Similar to the f^2 effect size approach for assessing R^2 values, the relative impact of predictive relevance can be compared by means of the measure to the q^2 effect size. As a relative measure of predictive relevance, values of 0.02, 0.15, and 0.35 indicate that an exogenous construct has a small, medium, or large predictive relevance, respectively, for a certain endogenous construct. This figure must be computed manually because the Smart-PLS software does not provide them. The result is showed as below:

$q^2_{SR->ES}$=0.000; $q^2_{HR->ES}$=0.0018 and $q^2_{TE->ES}$=0.0018 which show SR, HR and TE have not predictive relevance for ES.

$q^2_{FI->ES}$=0.0124; $q^2_{CO->ES}$= 0.016 which show FI and CO have nearly small predictive relevance for ES and $q^2_{CM->ES}$=0.03 which shows CM has above small predictive relevance for ES.

$q^2_{RE->ES}$= 0.089 which shows RE has nearly medium predictive relevance for ES; $q^2_{PO->ES}$= 0.177 which shows PO has above medium predictive relevance for ES.

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DOI: 10.5281/zenodo.15423685

4.4. Multi-group analysis

The results of the multi-group analysis show that there is no significant difference in the relationships based on export experience. However, there are differences in export markets, geographical location, and exported products in some relationships, as shown in the table below:

Table 5: Results of multi-group analysis

Enterprise's characteristics		Relationship	p-value
Export markets	From 3-5 export markets (β = -0.082) and from 1-2 export markets (β = 0.48)	CO → ES	0.023
	From 6-10 export markets (β = 0.215) and from 1-2 export markets (β = -0.186)	HR → ES	0.047
	Above 10 export markets (β = -0.174) and from 1-2 export markets (β = 0.48):	CO → ES	0.017
Geographical location	Ho Chi Minh City (β = 0.716) and the Southwest region (β = 0.389)	PO → ES	0.017
Exported products	Processed products (β = -0.117) and diversified products (β = 0.089)	HR → ES	0.019
	Processed products (β = 0.345) and diversified products (β = 0.564)	PO → ES	0.007
	Processed products (β = 0.418) and diversified products (β = 0.255)	RE → ES	0.05

Source: Authors' data processed results

5. CONCLUSION AND IMPLICATIONS

To meet the research objectives, a mixed methodology combining qualitative and quantitative methods was applied. The results show that there are positive effects of regulations on sustainable seafood export development, government supporting policy, commitment to sustainable development in EVFTA, financial resource and competitiveness on sustainable development of seafood exports. In addition, the results also show that there are no differences in any of the relationships in the research model based on export experience. However, there are differences based on the number of export markets, geographical location and exported products in some relationships.

The Importance–Performance Map Analysis (IPMA) method is employed to assess the impact of factors in the model by integrating both the actual performance and the relative importance of each variable. In addition, IPMA also reveals the prioritization of factors in the model, supporting managerial decision-making and performance improvement (Martilla & James, 1977). This chart consists of a horizontal axis representing the importance of the independent variable to the dependent variable, measured by the Importance Index, with a maximum value of 1. Meanwhile, the vertical axis represents the performance of the independent variable through the Performance Index, which ranges up to a maximum value of 100 - the closer the value is to 100, the higher the performance; conversely, lower values indicate poor performance.

ISSN 1533-9211

DOI: 10.5281/zenodo.15423685

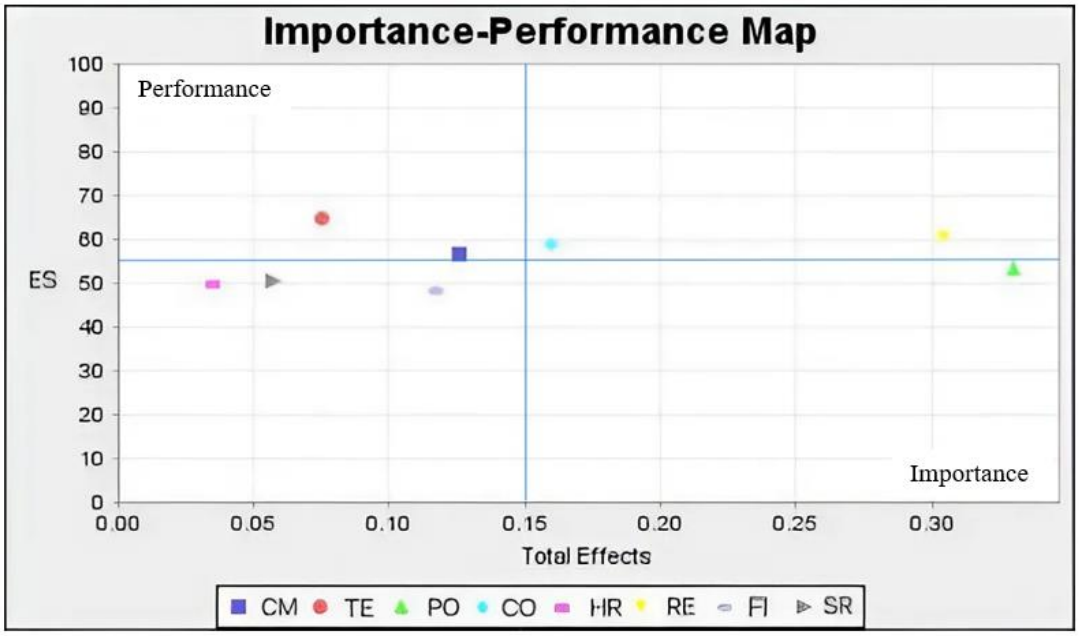

Figure 3: Importance-Performance Map Analysis

Source: Authors' data processed results

According to Henseler et al. (2009), factors with high importance but low performance should be prioritized in the development of managerial implications. Therefore, the prioritization order of the factors for proposing policy and managerial implications is PO, RE, CO, CM, FI, TE, SR, and HR. Based on the research results and Importance-Performance Map Analysis, some policy and managerial implications are suggested as follows.

First, enhancing the effectiveness of support policies. Government support policies) are identified as the most influential factor in promoting the sustainable development of seafood exports to the EU, highlighting the critical role of this factor. In addition, the multi-group analysis reveals significant differences between Ho Chi Minh City and the Southwest region, as well as between diversified and processed product groups, in terms of the impact of support policies.

In order to enhance the effectiveness of support policies, the government should strengthen and expand preferential tax policies to encourage enterprises to engage in sustainable seafood production and business, with a particular focus on supporting the Southwest region.

Additionally, improving and expanding preferential credit programs is essential to help seafood enterprises gain easier access to capital, especially for those in the Southwest region and those involved in processed products. The government should also promote programs that support enterprises in participating in social responsibility activities, which would help enhance the reputation of the seafood industry, again with special attention to the Southwest region.

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DOI: 10.5281/zenodo.15423685

Furthermore, continued reform of administrative procedures is necessary to create more favourable conditions for seafood export enterprises, ensuring smoother operations and greater competitiveness in international markets.

Second, improving the legal framework and regulations for sustainable export development. The government should prioritize collaboration with the EU to minimize the impact of strict import regulations, while also supporting enterprises in adapting to these requirements. At the same time, it is crucial to focus on improving the domestic legal framework to align with EU standards. Strengthening the enforcement of sustainable regulations will incentivize enterprises, while addressing challenges such as the IUU 'yellow card' and high compliance costs. This combined approach will help ensure that enterprises remain competitive and compliant with international regulations, promoting sustainable growth in the export sector.

Third, strengthening sustainable development commitments in the new-generation EVFTA. Enterprises should view the environmental and climate sustainability commitments in the EVFTA as a driving force to improve production processes, leverage tariff preferences, and overcome barriers such as the IUU 'yellow card'. In addition, they must raise labour standards to meet the requirements of the EVFTA and focus on fulfilling the origin requirements outlined in the agreement. By aligning with these commitments, enterprises can enhance their competitiveness in the EU market while contributing to sustainable development and compliance with international trade standards.

Fourth, optimizing financial resources. Enterprises should enhance financial management efficiency by utilizing accounting tools and professional systems, while proactively exploring public financial resources and subsidies from the government or international organizations. Strengthening their financial foundation and leveraging preferential loans will help maintain stable operations, ensuring resilience in the face of market challenges. Additionally, enterprises must enhance monitoring and transparency in the use of financial resources to ensure accountability and foster trust among stakeholders, which is essential for long-term success and growth.

Fifth, leveraging competitiveness to drive innovation. Enterprises should leverage their internal competitive capabilities to enhance production capacity and meet large orders from the EU, especially for those exporting to 3–5 or more than 10 markets, in order to strengthen their position against competitors. Additionally, they should optimize production and supply chain costs by taking full advantage of their competitive edge.

It is also crucial for enterprises to develop their competitive capabilities to flexibly adjust products based on the specific requirements of each EU market. Furthermore, leveraging their competitive advantage to develop strategies for controlling and overcoming threats from competitors will be essential to strengthening their position in the EU market, particularly when expanding from 1-2 markets to multiple markets in the EU.

Acknowledgement: This research is funded by University of Finance - Marketing.

Disclosure statement: The authors report there are no competing interests to declare.

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DOI: 10.5281/zenodo.15423685

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