The impact of outsourcing cold chain logistics services on the financial performance of agricultural enterprises in the southeast region of Vietnam
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Abstract: This study delves into the agricultural industry and the cold chain logistics market, focusing on the impact of outsourcing cold chain logistics services on the financial performance of agricultural enterprises in the Southeast region of Vietnam. It assesses various factors influencing businesses' decisions to use cold chain logistics services, including electronic word-of-mouth, corporate image, outsourcing mindset, advantages, hazards, strategic considerations, functional features, supplier variables, interparty relationships, and environmental factors. The study's findings demonstrate high reliability, with Cronbach's Alpha coefficients ranging from 0.811 to 0.877. The observed variables in this Exploratory Factor Analysis (EFA) had factor loadings ranging from 0.535 to 0.882 (all exceeding 0.5), indicating that no variables were removed and that the observed variables met the EFA analysis requirements. The EFA categorized 56 observed variables into 12 distinct factors, clarifying the variable structure. Confirmatory Factor Analysis (CFA) validated the research model's appropriateness, confirming its effectiveness in describing relationships between variables. Overall, the study provides robust evidence supporting the reliability and validity of the research model in assessing the impact of outsourcing cold chain logistics services on enterprises' financial performance.

1   Introduction

The Southeast Region is one of the most developed agricultural production areas in Vietnam, featuring a wide variety of crops and aquaculture spread over large areas. However, maintaining the quality and value of agricultural products necessitates the use of cold chains. In the Southeast Region, cold chains are extensively used to preserve products such as vegetables, fruits, seafood, and animal products like beef, pork, and chicken [1].

Transportation companies and businesses can utilize vehicles such as trucks, container trucks, and air transport to move goods maintained within cold chains. Additionally, cold storage facilities are used to protect products from insects and bacteria. The use of cold chains in the production and transportation of agricultural products in the Southeast Region is crucial for enhancing product quality, increasing the commercial value of agricultural products, providing additional income for farmers, and reducing goods wastage [2].

Organizational behavior in the decision-making process regarding the use or outsourcing of services is a complex and significant research area that has attracted considerable attention from the economic and management research community. Various theories have been proposed to explain this organizational behavior, including notable theories such as Transaction Cost Economics (TCE) by Coase (1937), Core Competency Theory (CCT) by Prahalad and Hamel (1990), and Relationship Theories (RT) proposed by Klepper (1995). A review of related studies indicates significant differences in demonstrating the impact of factors on outsourcing decisions. This variance is due to each author using different foundational theories or drawing from empirical studies. However, most research is based on three main theories: TCE, RBV, and CCT. Thus, each study typically explains only one or a few factors influencing the extent of outsourcing by businesses and does not fully generalize the factors affecting outsourcing, such as follows:

First, studies using the TCE theory emphasize two important factors influencing outsourcing: benefit and risk factors. According to TCE, these studies highlight the role of cost savings for businesses [3-8]. Additionally, the TCE theory suggests that outsourcing also depends on the considerations and attitudes of business managers toward this activity [6,7]. However, TCE-focused studies often overlook the role of organizational functional characteristics, the compatibility of outsourcing activities with strategic orientations, and the ability of service providers to meet requirements.

Second, studies using the RBV and CCT theories also emphasize the benefits of leveraging resources from external organizations/individuals [7,12]. Additionally, the RBV and CCT theories discuss the influence of organizational functional characteristics, outsourcing

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strategies, and the ability of service providers to meet requirements on the use of services [7,13,14]. However, studies based on RBV and CCT are limited by a lack of attention to the influence of managers' attitudes on outsourcing services and the risk factors when businesses outsource.

Previous global research has shown that earlier studies mainly focused on assessing factors influencing decisions to outsource logistics services in specific countries, cities, or sectors such as pharmaceuticals, construction, etc. Due to cultural and economic differences and income levels, these studies show that the factors influencing the use of logistics services in these countries are different and cannot be used to analyze the use of logistics services in developing countries like Vietnam.

Given the theoretical and practical urgency, the author decided to choose the topic " The Impact of Outsourcing Cold Chain Logistics Services on the Financial Performance of Agricultural Enterprises in the Southeast Region of Vietnam". The study will provide a comprehensive understanding of the cold chain logistics market and the agricultural sector in the Southeast Region, including the factors influencing the decision to use cold chain logistics services by agricultural businesses there.

2 Literature review

As of right now, there's no one cohesive explanation explaining the beginnings and development of outsourcing [14]. When attempting to understand outsourcing operations in the context of their research, researchers frequently turn to a variety of pertinent ideas. The paper uses particular theories as follows, which are based on the results of empirical investigations and the applicability of theories for the outsourcing in the Southeast Region.

2.1 Transaction Cost Economics - TCE

According to the TCE theory proposed by Coase (1937), saving transaction costs in business operations plays a crucial role for enterprises. This can affect their competitiveness and survival. TCE emphasizes that to save costs, enterprises can take advantage of opportunities by utilizing the resources of external organizations and units. Therefore, the TCE theory can explain the question "Why do businesses need to use outsourcing services?". This decision depends on comparing internal transaction costs and external transaction costs. If internal costs are higher than external costs, enterprises tend to outsource more and vice versa [15].

From this argument, according to TCE, the decision to outsource depends on the cost-saving benefits. Expanding from Coase's (1937) TCE theory, Williamson (1975) emphasized that TCE theory, widely studied in relation to outsourcing, provides an essential tool for enterprises in deciding to use Outsourcing Services (OS). However, TCE primarily focuses on the benefits to enterprises and may not account for the risks of encountering increased transaction costs, opportunism, or the risk of service providers shirking

responsibilities. This can negatively affect the effectiveness of the enterprises' operations, particularly for SMEs when using OS [7].

Therefore, according to TCE, the decision to use outsourced resources depends on perceptions of benefits, risk assessments, and the attitude of the manager towards outsourcing activities in the enterprise, especially in SMEs in the Southeast Region.

2.2 Resource Based Views and Core Competency Theory

The Resource-Based View (RBV), proposed by Barney (1991), emphasizes the uneven distribution of resources among enterprises. Smaller enterprises often struggle with competition and become more vulnerable than larger enterprises due to competitive pressures and internal resource shortages. To address this issue, many enterprises have expanded outsourcing to utilize external resources to reduce competitive pressure [16]

Developed the Core Competency Theory (CCT) based on the Resource-Based View (RBV). According to CCT, in a volatile business environment, enterprises must identify their core competencies to develop and enhance their competitive advantages. Each organization typically possesses unique internal strengths that need to be leveraged to maximize benefits and capitalize on business opportunities. To achieve this, enterprises implement strategies that utilize their capabilities to attain sustainable competitive advantages. Fundamental resources of enterprises include manpower, knowledge, information technology, capital, and assets [15]

Although the CCT is often applied to analyze competitive advantages in the business operations of international corporations, CCT also plays a significant role in studies on the use of outsourcing services [9,12,13]. According to Dominguez (2005), outsourcing non-core activities is the most effective method for leveraging resources within an enterprise. Research on outsourcing, especially in SMEs, often applies CCT to analyze factors affecting the decision to use Outsourcing Services (OS) [10,11,14]. Based on CCT, the decision to use external resources depends on the nature of the jobs within the organization. Kamyabi and Devi (2011) indicate that SMEs mainly outsource non-core functions, focusing on core activities to optimize performance. However, there are cases where enterprises with sufficient internal resources still choose to outsource, even core activities, as the decision to outsource also depends on the enterprise's operational strategy [14].

To further explain CCT, Hale (2006) noted that enterprises often choose outsourcing when managers and employees do not have enough time to perform internal business tasks. Enterprises cannot perform these tasks as effectively as outsourcing can. Therefore, to ensure the effectiveness of outsourcing activities, enterprises need to: assess internal capabilities to choose outsourcing activities; evaluate the selection of service supply partners; assess the

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effectiveness of outsourcing activities within the organization [17].

From these arguments, it is clear that combining the Resource-Based View and Core Competency Theory helps to identify and explain factors influencing the extent to which SMEs in the Southeast Region use external resources. The decision to outsource can depend on several factors, including: assessing the benefits that outsourcing activities bring to the enterprise; the enterprise's outsourcing strategy; the ability of the service supply partner to meet requirements; and the functional characteristics of the enterprise.

2.3 Relationship Theory – RT and Social Capital Theory – SCT

The topic also builds upon Relationship Theory (RT), RT theory emphasizes the significant role of cooperative relationships and economic exchanges between organizations. The result of these relationships is efficiency and benefits for all parties involved. This theory can explain why organizations, especially small and medium-sized enterprises (SMEs), often have closer business relationships.RT focuses on building agreements where each party considers the motivations to maintain the relationship to achieve efficiency for themselves from it. Therefore, RT can be applied to explain the intensity or extent of outsourcing by businesses, with the significant role of relationships between parties contributing to the decision to use outsourcing services and the operational efficiency of the business [18].

Additionally, the research is based on Social Capital Theory (SCT) developed by Bourdieu (1986). SCT emphasizes the existence of linked relationships and acquaintances among individuals, organizations, and groups within social networks. These relationships are considered the basis for building trust and mutual recognition. SCT also asserts that to create wealth, individuals, organizations, and groups need to connect with each other in society. Therefore, SCT can explain the cooperative relationship between a business and its service provider. It also refers to cases where SMEs outsource services to build relationships with supply partners, aiming to bring benefits to the business beyond just cost reduction and profit-seeking [17].

All things considered, it is clear from the above analyses that fundamental theories such as RT, TCE, RBV, CCT, and SCT can be used in conjunction to identify and explain factors influencing the choice of cold chain logistics services for Vietnamese businesses in general, and SMEs in the Southeast Region in particular. These five theories suggest that there are seven fundamental variables that SMEs in the Southeast Region may consider when deciding whether to use external resources: (1) the perceived benefits that outsourcing activities bring to the business [15,20] (2) the risks when the business outsources [20] (3) characteristics of internal resources of the business [16,17,20,21]; (4) the compatibility of outsourcing

activities with the business's operational strategy [17], [20]; (5) the ability of the service provider to meet requirements [17,20]; (6) the attitude of business managers towards outsourcing activities [19]; (7) the relationship factor between the parties [14,18,22]. Accordingly, any decision related to the use of Outsourcing Services can impact the operational efficiency of the business [17-22].

3 Research model
3.1 Peer review process

The author's research model references typical elements from Transaction Cost Economics (TCE), Resource-Based View (RBV), and Core Competency Theory (CCT) as follows: (1) perceived benefits from outsourcing activities to businesses [15-17,19,20]; (2) risks when businesses outsource [19,20]; (3) characteristics of internal resources of businesses[16,17,20,21]; (4) alignment of outsourcing activities with business operational strategies [17,20]; (5) capability to meet the requirements of service providers [17,20]; (6) attitudes of business managers towards outsourcing activities [19]; and (7) relationship factors among parties [14,18,22]. Thus, any decision related to the use of services can impact the operational effectiveness of businesses [11,17-22].

Alongside recent studies related to decisions on choosing logistics services in general. The study includes factors such as electronic word-of-mouth [23,24], corporate image [23,24], and environment [25-30].

Based on previous studies, the author proposes the following hypotheses and research models (Figure 1):

H1: Perceiving benefits will positively impact attitudes towards outsourcing cold chain logistics services by businesses

H2: Perceiving benefits will positively impact the decision to use cold chain logistics services

H3: Risk control will positively impact attitudes towards outsourcing cold chain logistics services by businesses

H4: Risk control will positively impact the decision to use cold chain logistics services

H5: Attitudes towards outsourcing will positively impact the decision to use cold chain logistics services

H6: Outsourcing strategy will positively impact the decision to use cold chain logistics services

H7: The characteristic function factor will positively impact the extent of outsourcing in businesses.

H8: The standards factor for service providers will positively impact the extent of outsourcing in businesses.

H9: The relationship factor among parties will positively impact the decision to use cold chain logistics services by businesses

H10: The environmental factor will positively impact the decision to use cold chain logistics services by businesses

H11: The electronic word-of-mouth factor will positively impact the corporate image

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H12: The corporate image factor will positively impact attitudes towards outsourcing cold chain logistics services

H13: The decision to use cold chain logistics services will positively impact the financial performance of the enterprise.
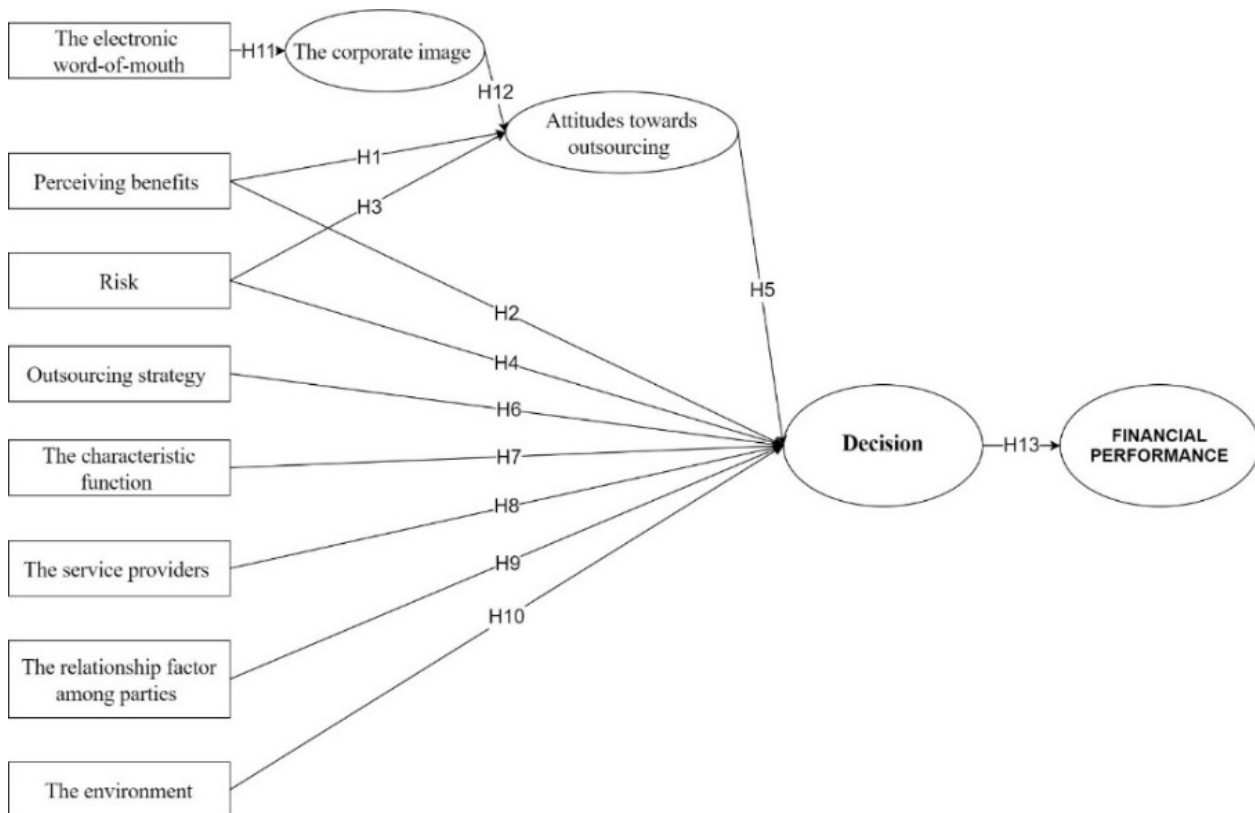

Figure 1 Research model

4   Result and discussion

The author analyzed the research results in detail, using AMOS software as the primary tool. Through this analysis, several important points were clarified:

Firstly, regarding Common Method Bias (CMB) analysis, the results do not indicate any serious issues related to Common Method Bias. This confirms that the relationships between the research concepts are not significantly affected by methodological bias, thereby enhancing the accuracy and reliability of the research findings. In the formal study, data were processed using SPSS 26.0, through Exploratory Factor Analysis (EFA) by fixing one factor without rotation. Harman's single-factor test through EFA revealed that a single factor explained 24.268% of the total variance. In this case, CMB is not considered a serious issue.

Next, in terms of Scale Reliability, Cronbach's Alpha coefficients for the scales ranged from 0.811 to 0.877, indicating strong reliability. This shows that the data have a high degree of consistency and that the measurement questions accurately and consistently represent the topics that have been researched.

By cleanly classifying 56 observed variables into 12 distinct factors, the Exploratory Factor Analysis (EFA)

helped to clarify the structure of the variables in the research model. Crucially, the validity of the scale and study model is further reinforced by the fact that no variables were taken into account for elimination.

The Bartlett's test got a Sig. = 0.000 (meaning it is less than the significance level of 0.05) suggesting that the variables are related to each other; the KMO test had a KMO coefficient of 0.903 (>0.5). This demonstrates how appropriate the EFA analysis was.

12 factors were extracted from 56 observable variables using EFA, with Eigenvalues = 1.174 (>1.0) and a total explained variance of 56.815% (>50%); no new factors were produced in comparison to the first study model that was suggested. The observed variables in this EFA instance had factor loadings ranging from 0.535 to 0.882 (all more than 0.5), indicating that no variables had yet been removed and that the observed variables matched the requirements of the EFA analysis.

Thanks to standard reaching fit indices, Confirmatory Factor Analysis (CFA) was able to further validate the excellent appropriateness of the research model with the gathered data. This offers strong proof that the research model was built successfully and is capable of effectively describing the relationships between the variables (Figure 2).

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The research's normal distribution was verified by skewness and kurtosis analysis. The data is regularly distributed, according to Kline (2015), if the absolute value of skew is two or less and less than three. A different way to assess a normal distribution is to check if the kurtosis's absolute value is equal to or less than 10. According to the results, the model's measurement questions' normal distribution was confirmed by the absolute values of skewness, which peaked at 1.022 (<3) for all of the questions, and kurtosis, which peaked at 1.321 (<10) [31].

Following these guidelines, the associations within the model were tested:

P-values for statistical significance tests had to be less than 0.05.

A direct or inverse relationship between two factors is indicated by a positive or negative value of the calculated correlation coefficient.

The stronger the influence between the elements, the higher the computed correlation coefficient's absolute value.

The ML estimate method in conjunction with linear structural analysis revealed that the model had 1443 degrees of freedom. The Chi-square corrected for degrees of freedom, or CMIN/df, was 1.614, assuring it is less than 2.00, even though the Chi-square value was p =.000 (Chi-square = 2328.590). Apart from that, other indices also satisfied the requirements: RMSEA = 0.041 (meeting the criteria <.080); CFI =.910; TLI =.904; GFI =.821 (all matching the condition >.90). Hair et al. (2011) state that a GFI > 0.8 is still regarded as acceptable. We can therefore draw the conclusion that this model is appropriate for the market data that has been gathered.
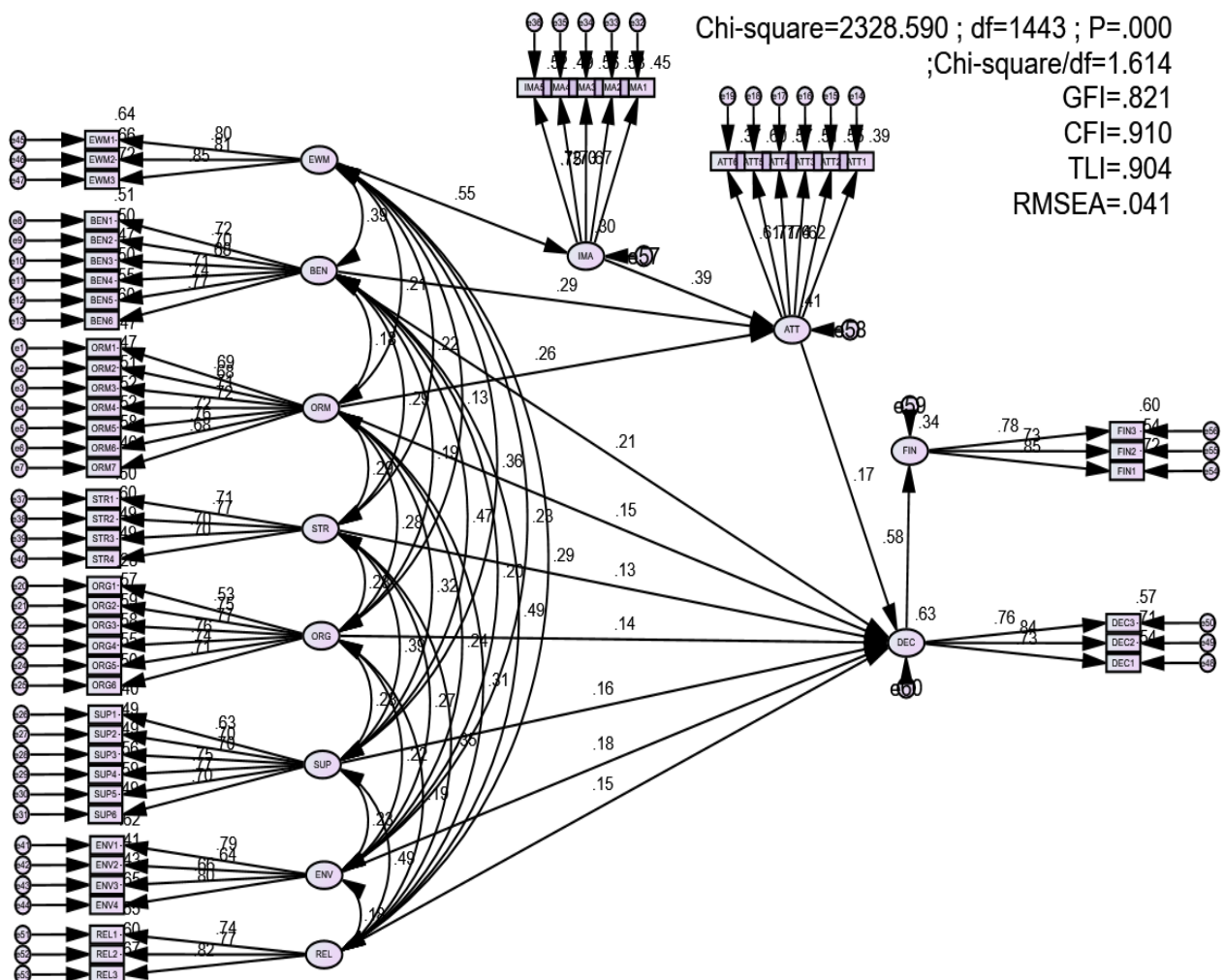
Source: author's complication
Figure 2 Standardized SEM results of the research model

With p-values less than 0.05, Table 1 demonstrates that all of the hypotheses were accepted and that these factors

significantly influence the decision to engage cold chain logistics services. The values of the standardized

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regression coefficients, a metric that illustrates the degree to which independent variables affect the dependent variable in a regression model, are also shown in Table 1. Here's a more thorough examination of these coefficients for every hypothesis under study:

H1 and H2 (Perception of Benefits): With coefficients of 0.292 and 0.206, respectively, the standardized regression coefficients show that the perception of benefits has a considerable impact on attitudes toward and decisions to use cold chain logistics services. This suggests that a favorable opinion of the advantages of the service can encourage a favorable attitude as well as a favorable choice to utilize it.

H3 and H4 (Risk Control): Regression coefficients of 0.262 and 0.145 suggest that risk control not only improves the outsourcing attitude but also positively impacts the decision to use the service, although the effect is stronger on attitude than on the direct decision.

H5 (Outsourcing Attitude): The outsourcing attitude has a moderate impact on the decision to employ the service, as indicated by its coefficient of 0.174. This indicates that adopting a good attitude towards outsourcing is crucial in order to influence real decisions.

H6 to H10 (Other factors such as outsourcing strategy, functional characteristics, supplier standards, relationships among parties, environmental factors): These coefficients range from 0.129 to 0.184, indicating that each factor significantly impacts the decision to use the service, but not as strongly as perception of benefits or risk control.

H11 and H12 (Electronic Word of Mouth and Corporate Image): With coefficients of 0.55 and 0.393, respectively, high regression coefficients show the significant impact of corporate image and electronic word of mouth on the outsourcing attitude and the choice to employ the service. This illustrates how crucial it is to create and preserve a favourable company reputation in the eyes of the public.

Table 1 Results of testing the research hypotheses

Hypotheses	Unstandardized Regression Coefficient	P value (p < 0.05)	Standardized Regression Coefficient	Hypothesis Testing
H1: Perceiving benefits will positively impact attitudes towards outsourcing cold chain logistics services by businesses	0.255	0.000	0.292	Accept
H2: Perceiving benefits will positively impact the decision to use cold chain logistics services	0.206	0.000	0.206	Accept
H3: Risk control will positively impact attitudes towards outsourcing cold chain logistics services by businesses	0.245	0.000	0.262	Accept
H4: Risk control will positively impact the decision to use cold chain logistics services	0.155	0.005	0.145	Accept
H5: Attitudes towards outsourcing will positively impact the decision to use cold chain logistics services	0.2	0.001	0.174	Accept
H6: Outsourcing strategy will positively impact the decision to use cold chain logistics services	0.12	0.015	0.129	Accept
H7: The characteristic function factor will positively impact the extent of outsourcing in businesses.	0.126	0.003	0.145	Accept
H8: The standards factor for service providers will positively impact the extent of outsourcing in businesses.	0.173	0.006	0.162	Accept
H9: The relationship factor among parties will positively impact the decision to use cold chain logistics services by businesses	0.142	0.01	0.153	Accept
H10: The environmental factor will positively impact the decision to use cold chain logistics services by businesses	0.169	0.000	0.184	Accept
H11: The electronic word-of-mouth factor will positively impact the corporate image	0.491	0.000	0.55	Accept
H12: The corporate image factor will positively impact attitudes towards outsourcing cold chain logistics services	0.338	0.000	0.393	Accept
H13: The decision to use cold chain logistics services will positively impact the financial performance of the enterprise	0.737	0.000	0.581	Accept

Source: author's complication

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5   Conclusions

In conclusion, this study developed an effective evaluation model to explore the factors influencing the decision to utilize cold chain logistics services in the Southeast region of Vietnam. The research confirms that various factors, including the perception of benefits, risk control, outsourcing strategy, functional characteristics, service provider standards, relationships among parties, environmental conditions, and electronic word-of-mouth, significantly impact the attitudes and decisions of businesses regarding the use of these services.

The findings, with p-values less than 0.05, indicate that all hypotheses (H1 to H13) were accepted, demonstrating the significant influence of these factors. Notably, the perception of benefits (H1 and H2) and risk control (H3 and H4) showed strong effects on attitudes and decisions, while electronic word-of-mouth and corporate image (H11 and H12) had substantial impacts on attitudes toward outsourcing.

To improve cold chain logistics services and positively influence businesses' decisions to outsource these services, the following suggestions can be made based on the proposed hypotheses:

Clearly articulate the benefits of cold chain logistics services, such as cost savings, improved product quality, and extended shelf life. Use case studies and success stories to demonstrate real-world advantages (H1, H2).

Implement and promote robust risk control measures, including real-time tracking, temperature monitoring, and contingency plans for potential disruptions. Communicate these measures effectively to build trust and confidence among businesses (H3, H4).

Work with businesses to develop tailored outsourcing strategies that align with their specific needs and goals. Provide consultation services to help them understand the strategic benefits of outsourcing cold chain logistics (H6).

Continuously improve the functional characteristics of logistics services, such as speed, reliability, and flexibility. Ensure that the services are adaptable to different types of products and varying business requirements (H7).

Adhere to high standards in service provision, including certification and compliance with industry regulations. Regularly audit and update service protocols to meet or exceed industry benchmarks (H8).

Build strong, collaborative relationships with businesses. Regular communication, transparency, and responsiveness to client needs will enhance trust and cooperation (H9).

Adopt environmentally friendly practices, such as using energy-efficient refrigeration units and reducing carbon footprints. Highlight these practices in marketing efforts to appeal to environmentally conscious businesses (H10).

Encourage satisfied customers to share positive feedback online. Utilize social media, review platforms, and testimonials to build a positive online reputation, which will, in turn, enhance corporate image (H11).

Invest in branding and public relations to strengthen the corporate image. A strong, positive corporate image will improve businesses' attitudes towards outsourcing (H12).

Provide clear evidence of the financial benefits of using cold chain logistics services. Use financial projections, ROI analysis, and performance metrics to show how outsourcing can lead to cost savings and increased profitability (H13).

By implementing these suggestions, cold chain logistics service providers can improve their offerings, build stronger relationships with businesses, and encourage more companies to adopt their services, ultimately leading to better financial performance for both parties

The study emphasizes the importance of understanding regional and economic contexts when analyzing service utilization decisions in developing economies. It provides a foundation for tailoring service offerings and adjusting legal frameworks to support the growth of the cold chain logistics sector in Vietnam and other emerging countries. Practical implications for service providers and government regulators include enhancing the business environment to allow stakeholders to evolve and adapt within specific market dynamics.

However, the study's focus on the Southeast region limits its generalizability to the entire country and broader market dynamics. Additionally, due to limited resources, not all potential influencing factors and financial outcomes were analyzed. Future research should consider a more comprehensive approach, including additional variables and wider geographical coverage, to better understand the decision-making processes regarding cold chain logistics services in Vietnam.

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