FACTORS AFFECTING THE LOGISTICS COST OF BUSINESSES IN LANG SON PROVINCE, VIETNAM

Trần Thị Thanh Xuân ✉

University of Transport Technology, Vietnam

xuanttt@utt.edu.vn

Bùi Thị Thùy

University of Transport Technology, Vietnam

thuybt@utt.edu.vn

Tạ Thị Hòa

University of Transport Technology, Vietnam

hoatt@utt.edu.vn

Abstract

The article aims to study factors affecting logistics costs of enterprises in Lang Son province. Through a survey of 135 transport enterprises in the province from August 2021 to January 2022, the research points out 6 determinants including Cost; Resources; Merchandise management; Employee awareness; Cargo control and insurance; Information. In particular, Cost has the strongest impact and Employee awareness creates the weakest influence on logistics costs of local enterprises. From those findings, some solutions are proposed to reduce logistics costs of enterprises in Lang Son province in particular and the country in general.

Keywords: Determinants, costs, logistics, transport enterprises, Lang Son

INTRODUCTION

Logistics are closely linked with each other; their effectiveness is decisive to enterprises' competition. Aware of the service role of logistics, the 17th Resolution of the Lang Son Provincial Party Committee for the 2020-2025 term defined the goal of "Focusing on developing high-quality service industries; building a modern transport and logistics infrastructure network" is an essential element in the construction and economic development of the province.

The demand for logistics services in Lang Son province is increasing day by day because this is a locality located in the critical economic region of the Northeast region, adjacent to the areas and cities with a high rate of industrial development. Sound of the whole country like Bac Giang; Quang Ninh; Thai Nguyen… and especially the province has 2 international border gates: Dong Dang Railway Station border gate, Cao Loc district, and Huu Nghi international border gate; There is one national border gate: Chi Ma (Loc Binh district) and 10 border crossings with China. The province is also an import-export center and a trade-service center of the northern mountainous areas and the whole country, the logistics center of the region.

To meet the practical needs of the province's economic development, trade, and international integration, on the other hand, to effectively develop logistics services in the area, contributing to the implementation of strategic orientations and planning. Regarding the development and improvement of the competitiveness of logistics services, Lang Son needs to develop and implement a plan to develop logistics services in the area in the coming time. Therefore, the assessment and analysis of factors affecting the logistics costs of enterprises in Lang Son province are essential.

METHODS AND CONCEPTS

Based on the primary factors affecting logistics costs include [1] Cost, Transport infrastructure, [2] Business method, [3] Expertise; [4] Number of goods; [5] Cargo control, insurance; [6] Informatin. The authors propose a model to study the factors affecting the logistics costs of enterprises in Lang Son province, as shown in Figure 1.
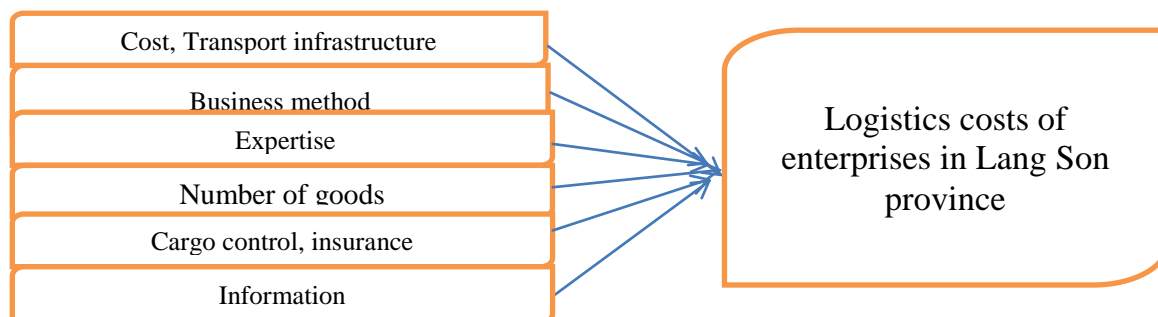

Figure 1: Proposed research model

Analytical descriptive research, combined with qualitative research. The study collects data from 06 groups of factors: [1] Cost, Transport infrastructure, [2] Business method, [3] Expertise; [4] Number of goods; [5] Cargo control, insurance; [6] Information in Lang Son province.

The sample was selected by non-probability method, in a convenient form with a survey panel. In this empirical study, there were 30 observed variables, so we surveyed and interviewed 135 transportation, warehousing, import-export, and manufacturing enterprises. We were doing business in Lang Son province from August 2021 to January 2022.

After the survey results are available, the authors process information, locate the scores, and synthesize them into a complete database using SPSS 20.0 software to support the data analysis. The tool to summarize survey and survey data is an Excel spreadsheet. The study used the statistical disaggregation method to summarize data and used statistical tables and charts to present the results of data aggregation.

RESEARCH RESULTS

Check the quality of the scale

The study has shown 5 scales representing influencing factors (30 observed variables) and 1 scale representing logistics costs (with 6 observed variables).

The analytical results (Table 1) show that all scales' Cronbach's Alpha coefficients have values above 0.70. The lowest is the Professionalism scale ($\alpha=0.702$), the highest is the Business Methods scale ($\alpha=0.770$).

Table 1: Characteristic variables and good quality scale

Variable group	Cronbach's Alpha	Conclude
1. CP (CPK1-10)- Warehouse costs	0,708	Acceptable
2. RE (RE1-5)- Enterprise business method	0,770	Acceptable
3. EA(EA1-3)- Specialize	0,702	Acceptable
4. CM (CM1-6)- Number of goods	0,746	Acceptable
5. CI (CI1-4)- Cargo Control, Insurance	0,763	Acceptable
6. IT (IT1-1)- Information	0,758	Acceptable

Exploratory factor analysis (EFA)

Research results show that, KMO = 0.869, satisfying the condition: 0,5<KMO<1, EFA analysis is appropriate for accurate data. Correlation test of observed variables in representative, Bartlett test with Sig.<0.05, observed variables have a linear correlation with representative factor.

From the results of Table 2, it can be seen that the characteristic variables all have factor loading coefficients greater than 0.512; in which there is a factor representing the factors affecting the logistics costs of enterprises that are rearranged differently from the original theoretical model:

Component 1: Includes variables: CP2, CP3, CP4, CP5, CP6, CP7, CP8, CP9, CP10, which are expenses related to the operation of the enterprise's facilities. Name this group's Costs (CP).

Component 2: Includes variables: RE1, RE2; RE3, RE4, RE5. Resources for businesses to operate. Name it Resources (RE).

Component 3: Includes variables: CM1, CM2, CM3, CM4, CM5, CM6, related to goods management. Name Commodity Management (CM).

Component 4: Includes variables: EA1, EA2, EA3, which is employees' level of management and awareness. Name this group Employee Awareness (EA).

Component 5: Includes variables: CI1, CI2, CI3, CI4, including jobs: Inventory control, insurance, and contracts between businesses and customers. Name this group Cargo Control, Insurance (CI).

Component 6: Including variables: IT1, IT2. Including activities: Forecasting demand, information in the distribution. Name this group Information (IT).

Table 2: Rotated Component Matrix

Component	Contents	Component					
		1	2	3	4	5	6
CP2	Road transport costs	.526					
CP3	Cost of river transport	.797					
CP4	Rail transport costs	.785					
CP5	Cost of river port premises	.679					
CP6	Warehouse space costs	.843					
CP7	Quality of river port warehouses	.655					
CP8	Warehouse quality	.825					
CP9	Select warehouse location	.818					

CP10	Transaction costs	.602			
RE1	Mode of operation		.549		
RE2	Investment capital of the enterprise		.654		
RE3	Affiliate partners		.648		
RE4	Shipping method		.836		
RE5	Source of raw materials		.865		
CM1	Amount			.774	
CM2	Setort			.763	
CM3	Inventory of finished products and raw materials			.647	
CM4	storage costs			.579	
CM5	Ordering costs			.597	
CM6	Goods collection			.702	
EA1	Professional expertise		.716		
EA2	English		.882		
EA3	Information technology		.763		
CI1	Customer service;				.825
CI2	Inspect the goods				.819
CI3	Insurance				.652
CI4	Contract				.512
IT1	Demand forecasting				.838
IT2	Information in distribution				.760

Thus, the scale quality tests and EFA model tests identify 6 scales representing the factors affecting enterprises' logistics costs, and 1 scale represents logistics costs with 30 feature variables.

Regression analysis

Based on a linear regression function of the form Y= β(0+) β1X1+ β2 X2+β3 X3 [2] we build a correlation between logistic costs and influencing factors as follows:

$$(TC)Y = \beta_{1+}\beta_2(CP) + \beta_3(RE) + \beta_4(CM) + \beta_5(EA) + \beta_6(CI) + \beta_7(IT)$$

In which β_i is the parameter to be determined, we choose the logistics cost factor (TC) as the dependent variable Y, the independent variables are included to test the influence on logistics costs, respectively: Cost (X_1);; Resources (X_2);; Merchandise management (X_3);; Employee awareness (X_4);; Cargo control, insurance (X_5);; Information (X_6).

The test results on IBM SPSS 20 software are shown in Table 3.

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.583	.083		31.276	.000
	CP	.469	.083	.429	5.656	.000
	RE	.450	.083	.412	5.423	.000
	CM	.328	.083	.383	5.058	.000
	EA	.165	.083	192	2.537	.013
	CI	.043	.083	.050	.661	.510
	IT	.369	.083	.430	5.678	.000

The authors performed an ANOVA analysis of variance to test the model's fit. The results (Table 4) show that Sig.<0.01, it can be concluded that the given model is consistent with the actual data. In other words, the independent variables are linearly correlated with the dependent variable with 99% confidence.

Table 4: Analysis of variance (ANOVAb)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.824	11	6.075	11.522	.000
	Residual	60.105	114	.527		
	Total	126.929	125			

From the above test results, we have the regression function of logistics costs of enterprises in Lang Son province as:

TC = 2,583 +0,469(CP) +0,450(RE)+0,328(CM)+0,165(EA)+0,43(CI)+0,369(IT)

CONCLUSION AND POLICY IMPLICATIONS

Concluding remarks

Research results show that the factors affecting logistics costs of enterprises in Lang Son province are: Cost; Resources; Merchandise management; Employee awareness; Cargo control, insurance; Information. The factor that has the most substantial impact on logistics costs of enterprises in Lang Son province is Cost, and the weakest effect is Employee awareness.

Policy implications

Based on research results, the authors propose some solutions to reduce logistics costs of enterprises in Lang Son as follows:

Firstly, Cost, Transport infrastructure: Logistics costs include 3 types: Transportation costs, warehousing, and storage costs. In which transportation costs account for > 68%. Currently, the logistics costs of enterprises in Lang Son province are higher than the standard level of the world and the region. Reducing logistics costs to increase competitiveness is an urgent problem that needs to be solved today for businesses in Lang Son province. When companies reduce logistics costs, they improve service quality. For Lang Son province to achieve the goal of an international transit hub, it is necessary to have synchronous solutions from the central to local levels, specifically: Complete highway projects border patrol road projects. Ensure progress of traffic infrastructure works connecting international border gates. Roads, railways, and waterways transport goods to Huu Nghi international border gate; Chi Ma national border gate; Tan Thanh sub-border gate; Coc Nam sub-border gate; Other border gates. Therefore, the State should build and synchronously connect the road, rail, and river transport systems and the warehouse system of Lang Son. This is one of the reasons why the logistics costs of enterprises increase.

Second, Business method: Lang Son enterprises should be well aware of the role of supply chain logistics: The logistics management department is often combined with other administrative departments, making the management of logistics costs continuous and closely linked. In addition, goods to reach users have to go through a few intermediaries, and all parties try to reduce profiteering for themselves. They are lowering costs for these intermediaries lower freight costs. Therefore, it is necessary to form a separate department for supply chain logistics so that businesses can closely coordinate with other functions because a decision of this function impacts other parts*.*

Third, Expertise: Human resources are the top concern of any country—a skilled and competent human resources team. In Lang Son province, there should be a more focused policy, prioritizing training and improving the quality of human resource management for the logistics service industry. According to the survey results in Lang Son province, the average number of employees has also increased, focusing on international transportation (freight purchase), freight forwarding services, warehousing, while businesses Enterprises are performing full-service logistics, integrated (3PL) or multimodal transport account for only about 10%. Also, according to this survey, the rate of trained employees (mainly self-trained and self-learner) is 72%; the Provincial Association of Transport Enterprises should have links with training institutions of short-term classes at reputable training institutions so that the company's

staff can be fostered with more professional knowledge. Another critical point is that the province has international border gates a large volume of import and export goods, so it is essential to cultivate employees' foreign language skills. Especially with the current opening trend, Chinese English... have become languages to help employees work more effectively and access the international working environment and have more ability to use the system. New and modern information technology of international stature. Due to the large volume of import and export goods, it is essential to cultivate employees' foreign language skills. Especially with the current opening trend, Chinese English... have become languages to help employees work more effectively and access the international working environment and have more ability to use the system. New and modern information technology of international stature. Due to the large volume of import and export goods, it is essential to cultivate employees' foreign language skills. Especially with the current opening trend, Chinese English... have become languages to help employees work more effectively and access the international working environment and have more ability to use the system. New and modern information technology of international stature.

Fourth, Number of goods: The procedures for warehouse control, Customs, Insurance, and administrative procedures have been simplified managerial procedures in warehouses, river ports, etc., train stations. Adjustment to reduce the area applied to international transshipment loading and unloading services to be more competitive with regional carriers. It is necessary to closely coordinate among members in the supply chain; the supply chain needs to reduce many intermediaries reduce the circulation of documents through many stages, from the supply of raw materials to the distribution of goods to consumers. Use; reduce forwarding costs, reduce transportation costs in the transport chain. The members of the transport chain should know the parties directly related to themselves and other members and the results of the logistics costs of the enterprise, from which there is a way to control goods and insurance in all stages.

Fifth, Cargo management solutions: In fact, the association of import-export enterprises and logistics service enterprises is still limited, not tight, and trusting. This is one of the reasons why the country's logistics services are less developed than required. The rate of outsourcing logistics nationwide, in general, is still meager, from 25-30%; in Lang Son province, this rate is 10.12% -15.23%. Enterprises in Lang Son province do not habit hiring outside package, integrated (3PL) or multimodal (4PL) logistics companies, but often undertake the transportation themselves. When businesses do it themselves, it means investing colossal capital in building warehouses, equipment, and means of transport. Solutions to hire 3PL companies; External 4PL will be effective and reduce logistics costs

Sixth, information: Nowadays, forecasting transportation needs to plan, arrange and coordinate vehicle is essential for every business. This is a vital link of each logistics business to

meet the needs in a timely and accurate manner to avoid errors in vehicle delivery and delivery and reduce delivery costs.

In addition, Lang Son province should regularly exchange relevant information to help import-export and logistics businesses grasp the situation provide professional support towards building a logistics transaction portal in each area.

In addition, the research team also recommended the Lang Son provincial government, the Lang Son Department of Transport to set up a management board for logistics services; organize conferences to connect businesses, accompany businesses in the field of river ports, warehousing and logistics; Continue to implement solutions to reform administrative procedures, attract goods to Lang Son province.

REFERENCES

Bản tin chuyên ngành Xuất nhập khẩu - Logistics kỳ 2 tháng 9/2021

Cục thống kê tỉnh Lạng Sơn (2021), Niên giám thống kê năm 2020.

Sở Công thương tỉnh Lạng Sơn (2021), Báo cáo thực hiện kế hoạch công thương năm 2020.

Sở Giao thông tỉnh Lạng Sơn (2021), Báo cáo tổng kết năm 2020.

Trịnh Thị Thu Hương (2018), Chi phí và năng lực logistics, Nhà xuất bản Lao động.

Trang thông tin điện tử logistics Việt Nam (2021), Ban biên tập Báo cáo logistics Việt Nam khảo sát tại tỉnh Lạng Sơn