

The International Cargo through Put Amount of Beibu Gulf Affecting Guangxi Economy Development

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Abstract:- As one of the key strategic policies of China, Beibu Gulf can be considered as a key port of Chinese Western region economy development. There still are many problems of it in its operation. Due to its rapid development, its cargo handle volume can be considered as one method in import and export improving. It also would be one significant development of Chinese and ASEAN countries' economy. With the settlement of Regional Comprehensive Economy Partnership Agreement, Beibu Gulf's economy position is becoming more and more important. With this precondition, to raise its service quality to improve its logistics performance would take more attention than other behaviors. To find out the relationship between the cargo handled volume and the import and export, it should be one of the keys in improving a region's economy.

Keywords: *Beibu Gulf, Cargo Handle Volume, Import and Export*

1. Introduction

As one of a very important Chinese strategic regional economy plans, Beibu Gulf Port has acted its position for more than 6 years. Moreover, this port also is the main port of Guangxi, China to connect with the world, especially in the RCEP region. Furthermore, the recent research shows the importance of it in China.

A. *Beibu Gulf Port*

As one of the strategic economy behaviors, Beibu Gulf located in Guangxi province face to South Sea of China, which is taking the responsibility on handling the cargo transportation to the southeast Asian. It also takes the job on the development of Guangxi, China.[2] Beibu Gulf contains three main ports which are Beihai, Fang Chenggang, and the Qinzhou, which can help the Guangxi as one of the free-trade zones of China. The recent data shows that this port has an increasing the logistics effect in the international trade service. It is meeting point of 3 economic circles of South China, Southwest China, and ASEAN. And Guangxi Zhuang Autonomous Region founded Beibu Gulf Port Co., Ltd. for promoting administration and economy development.

There are 4 major transportation method in these cities as follow:

- Road
- Track
- Water
- Multi-modal transportation

B. *The Relationship Between Port's Cargo Handling Volume and Port's Performance*

To research and evaluate the port's performance in logistics operation aspect as the research field. The aim of this research is to bring up the performance to add the value of the products to make a better turn-up of Asian economy. Furthermore, this will be a very good chance to build Asian countries as European Union to increase the comparative to face the world's economic shock under the Covid-19 situation, which still unknown when would be controlled.

There is a very important factor affects the trade goes fluent, which is the imbalance of the countries' development, no matter in the infrastructure and the economy. For example, China and Thailand, according to the Data which

is published by United State, the GDP of China and Thailand in the same period. Chinese GDP goes about 3-4 times more than Thailand's. To set the ball rolling, the author raises an idea to use the closest spot to make a better performance.

What we need to face is that how to enter a foreign market to perform the logistics. All the parties who take part in the trade would like to choose the most suitable logistic system to make the best profit of themselves. To make them be realized, they need to enter the foreign market and compete with the local logistic companies, furthermore, being localization in the foreign market. Especially to make the customers to be royal to it to make the league to earn more profit in this agreement to make a better development of the economy. There are a very important factor affects the trade goes fluent, which is the imbalance of the country's development, no matter in the infrastructure and the economy. For example, China and Thailand, according to the Data which is published by United State, the GDP of China and Thailand in the same period. Chinese GDP goes about 3 -4 times more than Thailand's. To set the ball rolling, the author raises an idea to use the closest spot to make a better performance.

Moreover, with the development of International Trade develop from massive goods to pieces, new Incoterms 2010 is now going to transfer to 2020, which is to take care of the small amount international trade, especially for e-commerce developing. Such as DHgate, Alibaba, and so on. According to these development, new border trade become a new trend of trade development. How to use the service quality measurement to evaluate the efficiency of a new logistic system. Base on the background information above, it is not hard to figured out the performance of Beibu Gulf Cities are not doing a good job [2]. The factors from out surrounding cannot be handled by the logistics performance, but we still can have an improving by raising the service quality of its performance to get more chances from the cooperating with other ports and organizations.

2. Literature Review

A. Logistics Progress

The logistics progress would be a key evaluating factor of this passage. Cause in this passage would develop the relationship between the service quality and logistics performance.

According to the Oxford Dictionary, "PROCESS" means "A series of action that you take to achieve your result." The logistics process means the process of moving the cargo from one site to another, during which need to consider the package, place, time, and the other relevant behaviors. To consider this series of behaviors, it contains not only in storage, inventory, and dispatch.

The operation function is responsible for making/sending valuable cargo and services, which is the main reason for any organization's existence.

The operations function of the organization concerns with the process of transforming input resources into useful outputs and thereby adding value to some entity; this constitutes the primary and central function of virtually every organization. [10] Lumír Peč ený, Pavol Meško, Rudolf Kampf and Jozef Gašparík [9] defined logistics is a complex science which improves the quality of commercial processes and which enables a company to react to demands of a market as well as of a customer faster. [12]

At the operational inbound logistics planning stage, these pre-selected logistics courses and resources will be continuously detailed and integrated into the production plant by pre-services processes during the ramp up.[14] And the logistics process including:

- Transportation
- Inventory
- Cargo Handling

Especially in the transportation process, the safety and the completely existing will be one of the key factors of service quality. Moreover, the service quality of the logistics organization would be considered as one of the keys affecting factors.

As Luptak raised in 2017, the operational research can be considered as a resource to find an optimal solution while evaluating various factors. [9]

B. *The 7Rs Theory*

Logistics theory often refer 7 “rights” (short as 7RS as following) must achieves in simultaneously for customer satisfaction. They are right product in the right quality, quantity, at the right place, right time and to the right customers at the right cost. [14] According to the 7RS theory, right time, right place and the right customer equals to the lean time, correct place and the customer demand which are also increasing the repeating purchasing of the international trade of the region to increase the economy.

And Seyhan Teoman [13, 14] consider a new 7RS as the following Table 1:

Table 1: Definition of the Generic and Customized 7Rs of Logistics

7Rs of Logistics		
Right Customer	Definition of the Generic 7Rs	Definition of Customized 7Rs
Right Product	Providing services meeting requirements of a specific market or region	Providing services fitting the requirements of any customer regardless market or region
Right Place	Product-specific service design with appropriate equipment and resources	Being capable to service for any kind of product (in any size, weight, or nature)
Right Time	Delivery of the customer order at the destination predefined by the customer	Delivery of the customer order at any location desired by the customer, even it is not a predefined destination
Right Quantity	Delivery of the customer order at the scheduled time or time-window	
Right Quality		
Right Cost (Price)	Delivery of the customer order in safe and good conditions	Delivery of the customer order in the condition that meets product-specific quality standard, as well as in customer-specific conditions
	Delivery of the customer order at the lowest possible cost	Delivery of the customer order at the price that the customer is agreed to pay provided that the above six are met

3. Methodology

A. *Data Collection*

The data is collected from Chinses Port Year Book from 2000 to 2022, Guangxi Statistical Year Book, Beibu Gulf Port Company and Beibu Gulf Office of Guangxi Zhuang Autonomous Region. [2,5,6,14] And the research will focus on the discovering the relationship of service quality and logistics operation process. The data will set the range from year 2000 to 2021 for the reality and the time effective.

B. *Measurement of Port's Performance and the Variable Selection [15]*

The variable will be selected from the total amount of the import and export, the passenger's amount, and the data of the cargo handled volume of the Beibu Gulf zone will contain different relation but this article focus on the relationship between the service quality raise to the GDP, total amount of import and export, cargo throughput, freight traffic, tertiary industry, exchange rate between Chinese yuan and US Dollars, and interest rate of Chinese yuan can be considered as one of the factors of export and import volume. And the last data of cargo handled volume also shows the effectiveness of the ports' effectiveness. The table was done by using the principal component analysis (PCA), which is a technique of factor analysis. The stepwise procedure developed by Hair, Anderson, Tatham, & Black [7] was chosen to carry out this PCA, with the aim of condensing the information contained within many variables (e.g., questionnaire items) into a small set of new composite dimensions while ensuring minimal data loss.[16]

C. Co-relationship Analysis

The process which is measuring the degree of correlation between two things and expressing it with appropriate statistical indicators that is called correlation analysis. Since the variables studied in this paper are all normal continuous variables and the relationship between them is linear, the correlation between binary isometric variables can be determined by the Pearson correlation coefficient. The calculation formula of the simple correlation number is as follows:

$$Y=C_0+X_1+X_2+X_3+\dots+X_6$$

The value arrange of the correlation coefficient is from 0 to 1. The absolute value of the correlation digital is closer to 1, indicating that the stronger the correlation is. Meanwhile the correlation number is closer to 0, the weaker the correlation degree. In general, the correlation strength of the variable is judged by the following four norms: the correlation coefficient is 0.8-1.0, it is strong correlation; The correlation coefficient is 0.6-0.8 strong where the X1 equals to the import and export amount, X2 equals to the passenger's amount, and X3 equals to the Beibu Gulf economy development. With this precondition, it shows the relationship among these 4 factors. And because the data of X is not equals to 0, so the X1, X2, and X3 are start from the data of year 2000-2021, we can figure out the formula's data according to the below Table 2:

Table 2. Data for Beibu Gulf from Year 2000-2021

Year	Total Exports and Imports (100 million USD) [2]	Freight Traffic (10 000 tons) [2]	International Cargo Throughput (10000 tons) [6]	Gross Domestic Product/GDP (100 million yuan) [2]	Tertiary Industry (100 million yuan) [5]	Exchange Rate (to US Dollar)	Interest Rate (%)
2000	203789.00	31270.00	1768.00	2080.04	791.78	8.2784	5.85
2001	179715.00	33267.00	1856.00	2279.34	933.78	8.2770	5.35
2002	243032.00	33392.00	1995.00	2523.73	1076.99	8.2770	5.49
2003	319173.00	33457.00	2406.00	2798.17	1183.44	8.2770	5.55
2004	428847.00	37118.00	3200.12	3305.12	1343.84	8.2768	5.76
2005	518289.00	41025.00	3669.00	3742.14	1513.09	8.1917	5.76
2006	667398.00	45454.00	4855.23	4417.77	1788.78	7.9718	6.30
2007	927686.00	50152.00	9408.00	5474.79	2185.93	7.6040	7.02
2008	1324179.00	84950.00	11923.00	6455.43	2567.15	6.9451	6.48
2009	1420599.00	95076.00	15331.00	7112.91	2972.11	6.8310	5.40
2010	1770609.00	113445.00	17437.00	8552.44	3447.57	6.7695	5.85
2011	2333084.00	136143.00	18673.00	10299.94	3998.33	6.4588	6.40
2012	2947369.00	161368.24	20189.00	11303.55	4615.30	6.3125	6.25
2013	3283690.00	151155.00	20392.00	12448.36	5171.39	6.1932	5.73
2014	4055305.00	137794.30	20482.00	13587.82	5934.49	6.1428	5.51
2015	5126215.00	149727.36	21862.00	14797.80	4156.47	6.2284	4.30
2016	4789694.00	160774.11	23986.00	16116.55	4005.97	6.6423	4.30
2017	5721023.00	174656.00	25568.00	17790.68	4608.56	6.7518	4.30
2018	6233834.00	190668.07	29567.00	19627.81	5167.42	6.6174	4.31
2019	6820238.00	183051.55	25568.00	10302.09	5648.63	6.8985	4.27
2020	7038496.00	187456.31	29567.00	21237.14	5971.57	6.8976	3.87
2021	9170155.00	216183.81	35821.00	12148.78	6562.05	6.4515	3.84

D. The Result Analysis

The analysis is under program SPSS, and the first check is the co-relationship between the Indicator and the Variables of the table 2. At the table 2, the author set the total export and import amount as the indicator and the other as Variables. Then following the formula to check the r:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}$$

From the SPSS program runs, the result can be seen as the table 3 and table 4 as following:

Table 3 The ANOVA A

Model		Sum of Squares	Degree of Freedom	Mean Square	F	Sig. (=significance)
1	Regression	6372303994265630	6	1062050665710930	338.23	.000b
	Regression Standardized Residual	40820304312283.10	13	3140023408637.16		
	Total	6413124298577920	19			
a Dependent : VAR00001						
b Predictor : (Factor), VAR00007, VAR00006, VAR00004, VAR00005, VAR00002, VAR00003						

Table 4. Model Analysis B

Model	R	R2	Adjusted R2	Standard estimation error	D-W test
1	.997a	.994	.991	1772011.12	2.104
a Predator (Factor) , VAR00007, VAR00006, VAR00004, VAR00005, VAR00002, VAR00003					
b Dependent : VAR00001					

And the result's testing result as table 5 as following:

Table 5. The Analysis Result of Indicator a

Model 1	Unstandardized indicator B	Standard error	Standard indicator Beta	t	Sig. (=significance)	Col linearity Tolerance	VIF	
1	Variable	-25954870.5	15710918.58		-1.652	0.122		
	VAR00002	85.861	42.422	0.305	2.024	0.064	0.022	46.364
	VAR00003	1245.367	344.088	0.708	3.619	0.003	0.013	78.168
	VAR00004	-123.078	166.667	-0.041	-0.738	0.473	0.157	6.374
	VAR00005	662.838	1274.709	0.07	0.52	0.612	0.027	37.224
	VAR00006	5835109.217	1477720.903	0.269	3.949	0.002	0.105	9.479
	VAR00007	-4578853.304	1123142.255	-0.211	-4.077	0.001	0.183	5.451
Indicator a : VAR00001								

According to the tables above, the result shows the significance of the variables are high. While the R shows 0.997 and R2 0.994. With this aspect, it can be considered the reliable of the model is very high and it can explain the exports and imports value. As it also shows the negative digital in some variables like freight traffic, the GDP digital and the interest rate of Chinese Yuan. Because in the year of 2019 to 2021 is the period of COVID-19 disaster [2]. It shows the decreasing of the cargo amount and the export and import amount.

4. Conclusion

This paper's data is collected from the year books and the relevant statics books from the government. It is published once but with the authority. Then the authors are using the regression to analyze the relevancy among

these variables. To show the relationship with how the Beibu Gulf's performance help's Guangxi Zhuang Autonomous Region. Especially in the relationship between the GDP index and the export and import value.

As it shows in the tables, the export and import value can be affected by the 6 variables in Table 1. The amount will be affected by the changing of these variables, and there is also a linkage among the others. The international cargo throughput value has a positive effect on the export and import value, which means with the increasing of the throughput amount the export and import value will be increasing, too. However, the exchange rate does not affect the export and import amount very much while there is a negative effect on it.

And the analysis also shows other variables affecting the economy development in Guangxi. Even the exchange rate of Chinese Yuan is decreasing but the amount of export and import, GDP do not get any decrease and the turnover still in a positive trend.

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