

# Grouping of Cost Involved in Seafood Export of Tamil Nadu- Exploratory Factor Analysis

S.Rajamohan and D.Joel Jebadurai

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## Abstract

*Cost plays an important role in every aspects of the product from the processing to till packaging of the product. Seafood manufacturers are adopting the strategy to reduce the cost of the product upto their maximum effort. The efforts are mainly for the reasons of reduce the cost of product and offer the product with low cost. The researcher has identified twelve cost involved in the processing plant of the exporter to reach the goods in the hands of the importer. The survey conducted with the 230 seafood exporters of Tamil Nadu by using the simple random sampling method. The researcher found the four groups among the twelve costs involved in seafood export by applying the exploratory factor analysis. The researcher would like to thank the authorities of Indian Council of Social Science Research for providing fund to complete the research work successfully.*

**Keywords:** *Cost, Seafood, Factor analysis*

## 1. Introduction

In the international market, exchange of goods is possible only through fixing the cost of the product. Cost is the sacrifice made for various monetary activities involved in seafood export. In recent days, seafood exporters are cost maker for the product they are exported. It is because of the seafood products exported from Tamil Nadu having the higher demand in the market. But the raw fish availability makes a significant impact on the cost of the seafood.

### Types of cost

Cost is an amount that has to pay in terms of monetary valuation of such as material, effort made by the labour and so on for to obtain something. The followings are the cost involved in the export process.

### Raw material procurement cost

Raw material procurement is a predominant cost involved in the seafood export. It occupy major portion of the total cost involvement in the export. In seafood the raw fish cost is high due to the reasons of scarcity and non-availability of the expected size of the fish.

### Labour cost

Labour costs contribute the significant impact on the seafood export. Seafood companies are selecting the labour from the nearby rural women only for the processing work. The amount paid them as a wages are also nominal level only.

### Customs clearance expenses

Customs duty is paid for to obtain the clearance from the customs authority for the export. It is decided by the customs authority. But it is decided based on the value of seafood products exported to the international market.

*Dr. S. Rajamohan, Professor, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamilnadu, India. Email: srajamohan1988@gmail.com, Phone: +91 9994590559 (Corresponding Author)*

*Dr. D. Joel Jebadurai, Assistant Professor, Acharya Institute of Graduate Studies, Department of Commerce and Management, Acharya Institutes Bangalore- 560 107 Phone: +91 9943172016, Email: Joeljebadurai64@gmail.com*

### Cargo handling expenses

It is an expenses incurred in the process of loading and unloading of goods in various places such as factory, berthing place in the port and customs verification in the importers place.

### Marine insurance premium

Marine Insurance is paid to the exported goods for the purpose of safeguard the goods from any cyclone and environmental evils.

### Transportation expenses

Transportation costs contribute the significant parts in the total cost of the product. There are different types of transportations involved in the export. For the purpose of transport the goods from exporter go down to harbour some kinds of charges involved, that is comes under the transportation charges. The cost of the transport is moderately involved in the export.

### Port usage cost

Port is the place to boarding the seafood in the ship for to transport the buyer place. For the purpose of using the port for loading the goods usage cost to be paid to the authorities.

### Electricity cost

Electricity is important in every parts of the export process of seafood. It is needed for the purpose of sustain the seafood in freezing condition without perish in very short time. So, the electricity cost is higher for the seafood companies.

### Warehouse rent

Every seafood exporters are having their own go down for to safeguard the seafood. If the exporter doesn't have a go down means, they utilise the private go down service operators. For that purpose they have to pay the rent to the warehouse service provider.

### Freight charges

Charges that have been paid for the transportation of the goods from the shipping yard to the importers place are called as freight charges.

### Container usage cost

Containerization is important to reach the goods in the hands of importers in good conditions. Reefer container is used for the seafood exporting. For the purpose of utilizing the container the trade party have to pay the amount.

### Packaging cost

Packaging cost is involved in the final stage of the seafood export. The packaging cost of seafood is depends on the types of seafood products exported and the country chosen for the trade.

### *Factor influencing the cost level of the seafood*

The following are the factors determining the level of cost of the seafood products in the international market.

1. INCO Terms
2. Availability of the fish
3. Competition in the market
4. Credit period offered to the importer
5. Payment system

## 2. Objectives of the Study

- To study the various cost involved in seafood export
- To find out the groups among the cost involved in seafood export

## 3. Methodology

The study is primarily based on the primary data. It is collected from the seafood exporters of Tamil Nadu by using the interview schedule. Simple Random Sampling method is used to collect the 230 responses from the total of 283 seafood exporters in Tamil Nadu. The total number of respondents list has been collected from the Marine Product Export Development Authority Websites. Exploratory Factor analysis method is used to find out the group among the various types of cost involved in the seafood export.

## 4. Results and Discussions

### *Cost Levied on Seafood Export –Factor Analysis*

Cost refers to monetary valuation or the amount that has been paid for the purpose of produce the products. Cost plays the significant role in the fixation of the price of goods. If the cost of the product is high, definitely it will have a higher impact on the price of goods. The researcher has identified major twelve cost involved in the seafood export. It involved from the processing to hand over the seafood in the boarding of ship. The respondents are asked to provide their opinion in the scaling of very high, high, medium, low and very low column. The researcher has used the multivariate technique by name factor analysis in order to classify the related variables.

Factor analysis consist of Kaiser-Mayer-Olkin (KMO) and Bartlett's test, principal component extraction method with the rotation of Varimax with Kaiser Rotation method with the objective of to identify the groups among the cost and find out the significance of the cost involved in the seafood export.

There are 12 cost involved in the seafood production to export. These costs are correlated with each other. In order to group the related variables, the researcher has decided to use the factor analysis. Before grouping the variable, the normality has to be ascertained. Hence for ascertaining the normality KMO has been used. The (KMO) measures of sampling adequacy index used to examine the whether the data are appropriate to examine the factor analysis. The values are range between 0.5 and 1.0 indicates the factor analysis is appropriate. The values below 0.5 imply that the factor analysis is not appropriate, either to collect more data or to rethink which variables to include. If the KMO value lies between .7 and .8 is good for factoring.

Bartlett's test of sphericity is a test in statistics used to examine the shape of normal distribution and also verify the smoothness of the curve. Table.1 explains two tests they are Kaiser-Mayer-Olkin (KMO) Measures of Sampling Adequacy and Bartlett's test of sphericity. It gives the statistics of KMO, Bartlett's test of sphericity and chi-square analysis of association, degrees of freedom and the probability value.

**Table.1 Cost Involved in Seafood Export-Kaiser-Meyer-Olkin (KMO) and Bartlett's Test**

KMO and Bartlett's test		
Kaiser-Mayer-Olkin (KMO) Measures of Sampling Adequacy	<b>.765</b>	
Bartlett's test of sphericity	Approx. Chi-square	<b>503.168</b>
	Degrees of freedom	<b>66</b>
	Sig.	<b>.000</b>

**Source:** Primary Data

Table.1 shows that the KMO value of 0.765, which indicates that the degrees of common variance among the variables is quite high, therefore factor analysis can be conducted.

#### *Cost Involved in Seafood Export- Principal Component Analysis*

The principal component analysis has been administered for grouping the factor of the various cost involved in the seafood export process. It is a method of data reduction. The proportion of the variance of particular item due to common factor is called as communality. The initial value of the communality in a principal component analysis is 1. The cost involved in the export process is placed in the components column. The extraction communalities estimate the variance in each variable accounted for the factors in the factor solution. The value is less than .5 indicates variables that do not fit well with the factor solution and should possibly be dropped from the analysis. Table.2 shows the extraction value of the respondents cost involved in the export process.

**Table.2 Cost involved in seafood export-communalities**

<i>Components</i>	<i>Initial</i>	<i>Extraction</i>
Raw material Procurement cost	1.000	.638
Labour cost	1.000	.508
Customs clearance expenses	1.000	.548
Cargo handling expenses	1.000	.580
Marine insurance premium	1.000	.586
Transportation expenses	1.000	.715
Port usage cost	1.000	.675
Electricity cost	1.000	.609
Warehouse rent	1.000	.633
Freight Charges	1.000	.683
Container usage cost	1.000	.500
Packaging cost	1.000	.601

Extraction method: Principal Component Analysis

**Source:** Primary data

Table.2 explicates the variance of the 12 variables ranging from .500 to .715. It shows that the 12 variables exhibit the considerable variance from 50 percent to 70 percent. Hence it could be concluded that all these 12 variables are capable of segmenting themselves with respect to the cost levied on export to form the predominant factors.

#### *Cost Involved in Seafood Export-Total Variance*

The total variance analysis is important to know the rotated sum of square value. The rotated four factors are determined based on the total Eigen values of the factor should be greater than one. The total cumulative variance explained by the total percentage of variance by each retained four factors. Table.3 gives the individual variances of the predominant factors emerged out of 12 factors.

**Table.3 Cost Involved in Seafood Export- Total Variance**

<i>Cost</i>	<i>Initial Eigen Values</i>			<i>Rotation Sums of Squared Loadings</i>		
	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>
Raw material procurement cost	3.329	27.739	27.739	2.355	19.623	19.623
Labour cost	1.473	12.278	40.017	1.802	15.015	34.638

Customs clearance expenses	1.100	9.710	49.186	1.479	12.327	46.965
Cargo handling expenses	1.074	8.951	58.137	1.341	11.172	58.137
Marine insurance premium	.887	7.389	65.526			
Transportation expenses	.756	6.302	71.827			
Port usage cost	.709	5.911	77.739			
Electricity cost	.630	5.254	82.992			
Warehouse rent	.623	5.192	88.184			
Freight charges	.568	4.732	92.916			
Container usage cost	.516	4.301	97.217			
Packaging cost	.334	2.783	100.00			
Extraction Method: Principal Component Analysis						

**Source:** Primary data

As could be seen from Table.3 is that, Eigen values are greater than one for four factors. From this, it is confirmed that, the twelve costs are grouped into four predominant factors. The rotated sums of squared loading are greater than 50 percent. The 12 variables are reduced into four predominant factors with the individual variances 19.623, 15.015, 12.327 and 11.172. It is also found that the total variance of the 12 variables is found to be 58.137 percent which is greater than the bench mark of 50 percent. Moreover, it confirms that the factor segment is the meaningful one.

#### *Cost Involved in Seafood Export-Rotated Component Matrix*

The rotated sum of square value indicates the cumulative percentage of variance is 58.137. Hence the factorization is more suitable for the cost involved in seafood export. Table.4 explains the value of rotated component matrix for the cost involved in seafood export.

**Table.4 Cost Involved in Seafood Export-Rotated Component Matrix**

Factors	Components			
	1	2	3	4
Raw material procurement cost	.811			
Warehouse rent	.782			
Packaging cost	.695			
Labour cost	.620			
Freight charges		.725		
Customs clearance expenses		.624		
Marine insurance premium		.606		
Container usage cost		.556		
Electricity cost			.776	
Cargo handling expenses			.639	
Transportation cost				.806
Port usage cost				.750
Rotation Method: Varimax with Kaiser Normalization Rotation Method				

**Source:** Primary data

Table4 portrays that the various types of cost are categorized into four factors. First factor consist of four variables namely raw material procurement cost (.811), warehouse rent (.782), packaging cost (.695), labour cost (.620) and all these factors are termed as "Processing Cost".

Second factor consist of freight charges (.725), customs clearance expenses (.624), marine insurance premium (.606) and container usage cost (.556). All these cost are known as "Clearing and Forwarding Cost".

The third factor is generated with two variables namely electricity cost (.776) and cargo handling expenses (.639). These factors are collectively called as "Utility Cost". Fourth factor comprises of two factors such as transportation cost (.806) and port usage cost (.750). These two factors may be called as "Service Cost".

## 5. Conclusion

The researcher has found the five groups in the twelve costs involved in the seafood export. The seafood companies operated in Tamil Nadu may be focused on the major four groups of cost for the smooth flow of trade and make the gain in the market.

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