International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8 Issue-4, November 2019

Factors Influencing Spot and Forward Freight Rates in Indian Logistics Industry

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ABSTRACT: ***Logistics sector plays an important role in the economics of every country. The logistics sector in India is expected to grow to USD 215 billion by 2020, employing more than 22 million people. A separate logistics division has been put in place in the Ministry of Commerce & Industry. The growth in Indian trade and commerce is also anticipated to be equally positive. The logistics sector in India has shown a significant development over the years and has also encouraged the technology enabled start up s which has provided a big opportunity of providing seamless movements of goods across the country. In this sector there are multiple factors which drive it towards its growth and boom. As a result, in movement of freight, freight forwarders and price plays an important role. Price volatility is the most significant issue for logistics market and for the clients using the logistics services. The challenge is to study and identify the various factors influencing the spot and forward freight rates. The questionnaire was developed to carry out the research and data was collected from the freight forwarders in Delhi. Factor analysis method is used in order to identify the key factors. Nine factors were identified as mode of transport, Distance, speed and time, Fuel price and Capacity, technological Advancements, Government Policies, Environmental Issues and Market Structure. To further analyse the data descriptive analysis was done. It was found that these nine factors have a significant impact on spot and forward freight rate which can be considered and implemented in order to maintain, enhance and achieve competitive advantage in domestic and international business.***

KEY WORDS: ***Factor analysis, forward freight rate, Freight rate, Spot rate.***

I. INTRODUCTION:

In current scenario, the Indian economy is growing at a faster pace. The logistics industry in today's era has gained Importance in national and international market as a result of advancement in communication and information technologies, reduced operational cost, efficient and effective delivery performance with increased customer satisfaction level. Effective logistics system contributes in terms of creating competitive advantage as it improves quality, delivery, flexibility of products and services, leading, more often to decrease in costs.

In order to maintain this economic development, country has to put more emphasis on its transportation and infrastructure sector. Roadways, Railways, Airways and waterways are an essential mode of transport for all industry sectors, ranging from high end manufacturing, engineering, pharmaceuticals, retailing, automotive and all the sectors of the industry.

It can take from few hours to months to take goods to travel from all the modes of transportation. Time taken varies with the mode of transportation. There are also some time-sensitive goods such as medicines and documents which cannot travel by any other way and only by airways. Thus the selection of the mode of transportation is of importance for a freight forwarder.

The growth in transportation sector, good quality national highways contributes to only 2% of India's road network. [10] explains that all finished consumer goods, both imported and exported will be transported to middle class consumer and by the year 2030, it is expected that increase four times from the existing middle class population of 160million.

II. REVIEW OF LITERATURE:

According to Freight transport Association, The logistics market in today's era is highly competitive with the penetration of new technologies, reduced operational cost, efficient and effective delivery performance with increased customer satisfaction level, thus making logistics companies more effective in terms of flexibility, quality, delivery and cost. The logistic sector has a key role in supporting economy recovery and growth. Logistics has been growing in the Indian as well as in the global context. The logistics industry in Global perspectives and in Indian prospective [9].This paper highlights about the current state of the industry, including the dynamics and opportunities for growth, globally as well as in India which is based on findings from logistics industry in India as well as in other countries. For a successful economy, effective and efficient freight transportation is an essential element [7]. There are various key issues and challenges that affect freight transportation market and logistics in the future .It helps to analyse the possibilities of the development of transport and logistics services. Logistics industry has to face great uncertainty and volatilities in prices. These prices have immense effect on GDP of the country. Price volatility is most significant issue for logistics market, like high fuel pricing have had a crippling effect on logistics industry, whose business viability is determined by price of a fuel. It explains about various strategies, policies and infrastructure are needed in right place to meet the national demands. Various opportunities and barriers to,

Manuscript published on November 30, 2019.
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innovation in freight and logistics components of selected export supply chain [12]. The research was carried in New Zealand and Australia and identified number of key trends in innovation common in all sectors like use of information technology, collaboration between industry participants, transport technologies, increased transparency and further recommendations have been made to address the specific issues.

Freight transportation demand is driven from all the activities needed to move goods between locations of production to locations of consumption which include logistics and transportation [13]. In current scenario, the attention for freight modelling has been growing. In this paper, the state of the art in the representation of logistics considerations in freight transport demand models. The main focus is on the service and cost drivers of changes in logistics networks and how these affect freight transport.

The various technology used in logistics and its impact. Innovative Technology used acts as a vehicle to enhance overall competitiveness in logistics system [1]. Usage of innovative technologies has made the task more convenient, easier and faster. With the advances in the technology, logistics sector has undergone a disruptive changes in inbound logistics, in manufacturing, in maintenance and repair ,in retail logistics and even in freight transportation by the usage of internet of things, Mobile and social media and cloud computing [16]. [5] have identified 12 influencing factors affecting maritime services which included transport reliability, integrated logistics, and transport security, freight tariffs, transit time, timely delivery, service attitude, maritime expertise, direct access, convenient shipping, sailing frequency and customs clearance efficiency, transit time, transport security and customs clearance efficiency. The key affecting factors are transportation reliability, timely delivery and freight tariffs. [4] identified various factors like Flexibility ,Delivery speed, delivery precision, Environmental issues ,Costs related choice of mode of transportation ,Reliability are the most influencing.[14] The key factors that affect costs include distance, waiting time, delivery time, fuel price, cargo value -to-weight, the direction of freight routes, and load factors.

The choice of mode of transportation between Intermodal rely on the trade offs between transportation costs vs. inventory holding cost plus lead time. [2]explains the various key factors are lead time, load size, transportation cost per mile (fuel price, fuel surcharge) and the value density of products.

[6] lists major freight transportation parameters that impacts the pricing are government interventions, transport intensity ,modal split, market diversity ,operational efficiency or fuel efficiency ,Service quality , Environmental impact .

Different researchers have conducted the research regarding the key influential factors which impacts spot and forward freight rates. Few factors have been mentioned under the literature Review in the paper. It is found that few factors are most important but for another researcher it is of less importance. So looking at the previous papers, it is difficult to come to a conclusion on which are the most important factors which affects the freight forwarders.

Transportation time and reliability

The transportation time and reliability are the most important factors which impacts spot and forward freight rates [15]. Time directly affects the spot and forward rate in logistics industry. The shorter the transit time, higher is the cost. The freight arrived with in the specified delivery time affects the forward rate.

The requirement of freight forwarder for their customers like reliability, safety, delivery time, accuracy of information ,quality of service along with personal treatment are utmost important [3] .

"The service quality in transport and forwarding is also a significant determinant of demand" [11]. In the competitive environment, it is an important tool for customer retention and also it has effects on the performance and economic results of the organisation. When we have a satisfied customer, it indicates competitive advantage and if we have a dissatisfied customer it creates a bad experience which results in affecting the attitude of the customers. There are various factors like reliability, transit time, over-supply, short supply and damaged, market considerations, carrier considerations, product characteristics which impacts spot and forward freight rates [8]. According to [6] logistics service provider has a major role in the development of international trade. Logistics service providers should improve in the quality of services like prompt communication, quick processing, flexibility in order to serve customer s need up to maximum extend. The main factors which creates an impact on exporters from the service providers are proper warehousing with good infrastructure, material handling, packaging, custom clearance and documentation.

The change in fuel price results in increase in forward rate. Change in fuel price impacts the choice of mode of transportation, which affects the spot and forward rate [2].

III. OBJECTIVES OF THE STUDY

The main objective of the study is to find the key factors which have an impact on Spot and Forward freight rate in Indian Logistics Industry.

NEED FOR THE STUDY:

Indian Logistics sector is poised for accelerated growth, led by GDP revival, infrastructure ramp up (railways/road/ports), e-commerce penetration, impending GST (Goods and Service Tax) implication and other initiatives. The need for development in logistics has been suggested as a major challenge for logistics researchers. With the emergence of new technologies and globalization, logistics market is moving at a fast pace and the requirement for further development in logistics remains a key priority. To survive and succeed in highly competitive environment mandates that a firm must have agility in the marketplace. The Logistics sector is affected by many environmental variables like fuel prices, infrastructure, etc. Logistics tariff has a substantial impact on the pricing of a product; product success in the market and the profitability of the firm. At the macro level it contributes as one of the engines of economic growth.

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The study aims to explore the dimensions of logistics sector issues with respect to spot pricing and forward pricing. To identify and examine the impact of various factors effecting spot rate and forward freight rate volatilities on the firm s performance and also on real world.. The main focus is to identify the various factors causing the volatilities in spot rate and forward freight rate, considering few Indian logistics companies.

IV. METHODOLOGY:

Research methodology is an approach to receive the needed information by discovering the data from various sources which may be primary and secondary. The adopted methodology is primary data collection. Structured questionnaire with 27 statements were measured on a Likert scale with labels ranging from strongly disagree (=1) to strongly agree (=5) was distributed and primary data is collected. The stratified random sampling technique is used and the questionnaire is distributed among 150 respondents and we got answers from 87 respondents. Initially there were 27 statements. Factor analysis was done to identify underlying factors.

V. ANALYSIS:

Croanbach's alpha method is used to find the reliability of data set and it was found to be 0.91, which is above the accepted value 0.6.Hence, data set can be accepted and it is reliable.

Table –I : Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.918	.915	27

Results of Factor Analysis

Further, the appropriateness of data for factor analysis need to be done and the sample adequacy test was done through Kaiser-Meyer-Olkin (KMO) and Bartlett's test. The value of KMO statistic is greater than 0.7 which indicates that the factor analysis is appropriate. The KMO and Bartlett's test of sphericity is significant and appropriate.

The Principal Components method for extraction was used with Varimax Rotation with Kaiser Normalization. The screening test extracted nine factors with Eigen value greater than 1 which shows the importance of each factor.

To check the appropriateness' of data for factor analysis, the communalities derived from factor analysis were By using the Component Extraction Method, nine factors were Identified and these nine factors accounted for 92.73% of the Total Variance as shown in Table III.

reviewed and each value is greater than 0.5 which indicates data set is appropriate and table shows the values of communalities for each statement.

Croanbach's Alpha method is used to find the reliability of data set and it was found to be 0.91 as shown in table I.

Table-II : Communalities

	Initial	Extraction
MT1	1.000	.721
MT2	1.000	.960
MT3	1.000	.881
MT4	1.000	.897
MT5	1.000	.917
DT1	1.000	.869
DT2	1.000	.972
DT3	1.000	.979
ST1	1.000	.918
FP1	1.000	.926
CFP1	1.000	.945
CFP2	1.000	.976
CFP3	1.000	.940
CF1	1.000	.972
CF2	1.000	.979
CF3	1.000	.960
TA1	1.000	.881
TA2	1.000	.897
GP1	1.000	.917
GP2	1.000	.869
GP3	1.000	.972
EI1	1.000	.979
EI2	1.000	.918
EI3	1.000	.926
EI4	1.000	.945
MS1	1.000	.976
MS2	1.000	.940

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Table –III: Total Variance Explained, by Extraction Method: Principal Component Analysis

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.203	34.084	34.084	9.203	34.084	34.084	4.131	15.299	15.299
2	3.557	13.174	47.259	3.557	13.174	47.259	3.842	14.228	29.527
3	2.908	10.770	58.028	2.908	10.770	58.028	2.948	10.918	40.445
4	2.591	9.597	67.625	2.591	9.597	67.625	2.778	10.288	50.733
5	1.736	6.430	74.055	1.736	6.430	74.055	2.504	9.273	60.006
6	1.602	5.934	79.989	1.602	5.934	79.989	2.362	8.749	68.755
7	1.248	4.623	84.612	1.248	4.623	84.612	2.199	8.146	76.902
8	1.164	4.313	88.925	1.164	4.313	88.925	2.156	7.986	84.888
9	1.023	3.789	92.713	1.023	3.789	92.713	2.113	7.826	92.713
10	.659	2.440	95.153						
11	.492	1.824	96.977						
12	.475	1.761	98.738						
13	.341	1.262	100.000						
14	2.124E-16	7.866E-16	100.000						
15	1.394E-16	5.162E-16	100.000						
16	8.694E-17	3.220E-16	100.000						
17	8.254E-17	3.057E-16	100.000						
18	2.508E-17	9.290E-17	100.000						
19	1.708E-17	6.326E-17	100.000						
20	-1.784E-17	-6.607E-17	100.000						
21	-2.104E-17	-7.793E-17	100.000						
22	-4.351E-17	-1.611E-16	100.000						
23	-7.587E-17	-2.810E-16	100.000						
24	-9.942E-17	-3.682E-16	100.000						
25	-1.225E-16	-4.536E-16	100.000						
26	-1.537E-16	-5.694E-16	100.000						
27	-2.306E-16	-8.541E-16	100.000						

The Nine factors which are identified as Mode of Transportation, Distance, Speed and time, Fuel price and Capacity, Technological Advancements , Government Policies, Environmental issues and Market Structure which clearly explains that these factors affects the spot and forward freight rate in logistics Industry in India.

VI. CONCLUSION

The study has clearly identified in details about the factors which impacts spot and forward freight rate in Indian Logistics Industry. By using extensive data analysis, nine key factors are identified as mode of transport, distance, speed and time, Fuel price and capacity ,technological advancements, Government Policies, Environmental Issues and Market Structure.

All the above mentioned factors clearly indicates that these factors can be considered in improving, maintain and achieving the competitive advantage in domestic and international business.

VII. LIMITATIONS AND FUTURE SCOPE OF THE STUDY

The present study has its own limitations with regard to sample size, study area, time and other resources. The questionnaires sent by mail to the employees of the organizations under study were received after a long waiting. Many of the questionnaires were not returned and some of the mailed questionnaires were filled up carelessly as were found incomplete and were finally rejected.

The study was done on the randomly in selected organizations from the population only in few logistics industry, so it was a limitation .It can be extended to more no of industry for more precise results.

The future scope of the study indicates that a further research can be carried out on these nine factors and further factor analysis can be done for more precise results.

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