



FACTORS INFLUENCING FREIGHT FORWARDERS IN SELECTION OF AIRLINES

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Abstract:

The purpose of the study is to institute the factors influencing the freight forwarders on selection of airlines. The survey was conducted among the freight forwarders of different places. The study was focused to find whether there is any relationship with the profile of freight forwarders and services rendered by them. Through factor analysis four factors were identified such as swiftness, pre-emptiveness, Business tactics and vitality. The factors of services of freight forwarders were tested with the profile of the freight forwarders.

Key Words: Freight, Swiftness, Pre-Emptiveness, Tactics & Vitality

Introduction:

Indian economy is one of the fastest growing economies in the world and fourth largest in terms of purchasing power parity. In order to maintain this sustainable economic development, country has to improve its transportation and infrastructure sector. Air transportation is indispensable for crossing international and national boundaries and consequently stimulates expansion of trade and economic growth. According to Boeing, India is the largest submarket in Southwest Asia, comprising about 63% of international flows in the region, and it possesses a vibrant domestic market as well. (World air cargo forecast).

Airfreight is an essential mode of transport for many industry sectors, ranging from high end manufacturing, engineering, pharmaceuticals, retailing and the automotive sectors. It can take a month to take goods from Europe to the Far East by ship; it takes a day by air. There are also time-sensitive goods such as medicines and documents which cannot travel any other way. Yet, its importance to the global economy is often overlooked with the focus almost exclusively centered on passenger and business travel. Aviation is a key enabler of global economic growth and social development. (Global shipper's forum 2015). Thus the selection of airlines for the purpose of stuffing the cargo is a paramount importance for a freight forwarder.

Review of Literature:

According to the study that has been stated by Rieple & Helm (2008); the airline sector can be taken into consideration as segments depending on scope, scale, and type of operation. The concentration in that point is major international, full-service, legacy airlines which are close to comparing within the customer segments.

According to Kilpi and Vepsäläinen (2004) case study; in a perfectly reasonable pooling arrangement the stock levels can be decreased by over 30% by making a minor sacrifice in short time service levels. As seen that inventory level should not be zero to reduce the need emergency transshipments. Furthermore, first-in-first-out (FIFO) can be used as an inventory method in that bases to improve service levels also to reduce to reduce same number of spare components.

Objectives of the Study:

The objective of the study is to find the factors influencing the freight forwarder in selecting a airline for stuffing the cargo.

Need for the Study:

The present day business is mounting in terms of air cargo. The freight forwarder and clearing house agents are striving hard to achieve the business volume to a greater extent. For the purpose the freight forwarders coordinate with various airlines to book the cargo space and to avail value added services too. The present study aims at analyzing the opinion of the freight forwarders, in terms of selection of airport and the factors influencing them in selection.

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

Sampling Size:

The Questionnaire was distributed to 400 freight forwarders all over Tamilnadu and only 329 returned which were valid and the remaining 71 were rejected.

Data analysis and Interpretation:

Table 1: Profile of the Freight forwarders

Profile of the freight forwarders	Frequency	Percent
Name of the airport		

Chennai International Airport	79	24.0
Coimbatore International Airport	83	25.2
Madurai Airport	87	26.4
Tiruchirapalli International airport	80	24.3
Nature of the firm		
National level private company	156	47.4
Multinational company	173	52.6
Number of years of functioning		
Less than 5 years	77	23.4
5-10 years	83	25.2
10-15 years	85	25.8
15 years and above	84	25.5
Agent of multiple airlines		
yes	187	56.8
No	142	43.2
Involvement		
Export only	129	39.2
Import only	130	39.5
Both	70	21.3

From the above table, it was understood that 26.4 percent of the respondents choose Madurai airport, 25.2 percent of the respondents choose Coimbatore International airport, 24.3 percent of them choose Tiruchirapalli airport and 24.0 percent of the respondents choose Chennai International airport. When considering the Nature of the firm, 52.6 percent of the respondents have multinational company and 47.4 percent of the respondents have National level private company. When taking into account the number of years of functioning, 25.8 percent of the respondents service were for the past 10-15 years, 25.5 percent of the respondents service were for the past 15 years and above, 25.2 percent of the respondents service were for the past 5-10 years and 23.4 percent of the respondents service were for less than 5 years only. When considering the operations of agent for airlines in airport, 56.8 percent of them operate as agent for all airlines in the airport and 43.2 percent of them do not operate as agent for all airlines in the airport. When considering the involvement in service, 39.5 percent of them only import, 39.2 percent of them export only and 21.3 percent of them do both import and export.

Factor Analysis of Factors Influencing Freight Forwarders in Selection of Airlines:

Reliability Statistics:

Cronbach's alpha test of reliability is performed, and only those items are selected which have a Cronbach's alpha of at least 0.717 or more (Table 1).

Table 2: Reliability Statistics (Cronbach's Alpha)

Construct	Items	Cronbach's alpha	Overall Cronbach's Alpha
Swiftness	4	0.798	0.798
Pre-emptiveness	4	0.749	
Business Tactics	2	0.717	
Vitality	3	0.720	

To determine the underlying structure, the correlation matrix was initially examined to determine how appropriate it was for factor analysis. Factor analysis was performed with thirteen statements related to services of freight forwarders. The Kaiser-Meyer-Olkin (KMO) value for the collected data was 0.752 which was higher than the recommended minimum of 0.6 (Kaiser, 1974), indicating that the sample size was adequate for applying factor analysis, and significant Bartlett's test of sphericity supported the use of factor analysis to extract independent variables associated with supplier selection. The degree of common variance among the 13 variables is mediocre which reflects that if a factor analysis is concluded, the factors extracted will account for fair amount of variance but not a substantial amount.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.752
Bartlett's Test of Sphericity	Approx. Chi-Square	1532.826
	df	78
	Sig.	.000

Table 4: Communalities

Short Description of Variables		Initial	Extraction
S1	Reputation of reliable service	1.000	.775
S2	On time delivery	1.000	.730
S3	Safety & security for Cargo	1.000	.572

S4	Tracking system for shipment	1.000	.596
S5	Service attitude of clearance staff	1.000	.752
S6	Responsiveness of clearing staff towards emerging situation	1.000	.730
S7	Air craft maintenance	1.000	.699
S8	Damage claim service	1.000	.728
S9	Reasonable freight and frequency	1.000	.693
S10	On time availability	1.000	.601
S11	Clear indication of container allotment	1.000	.633
S12	Clear indication of marked and directed to destination	1.000	.709
S13	Global presence	1.000	.527
Extraction Method: Principal Component Analysis.			

Based on the output of above table, all the variables have the communalities of more than 0.5. This means that all the variables have significant portion of the variance that contributes to the common factors. As the communality is the sum of squares of the loadings of the variables and all the variables are contributing significantly, all are included for the analysis of the final data.

To support the result, an exploratory principal component analysis was done using SPSS. Varimax rotation was used to identify the underlying factors for services of freight forwarders. Items with Eigen values greater than one were extracted and all the factor loadings greater than 0.5 were retained. 13 items yielded four factors explaining 67.287% of variance were shown in the below table.

Table 5: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.897	29.978	29.978	3.897	29.978	29.978	2.527	19.439	19.439
2	2.278	17.526	47.504	2.278	17.526	47.504	2.320	17.847	37.286
3	1.440	11.075	58.579	1.440	11.075	58.579	1.976	15.196	52.482
4	1.132	8.708	67.287	1.132	8.708	67.287	1.925	14.805	67.287
5	.857	6.594	73.882						
6	.717	5.514	79.396						
7	.542	4.169	83.565						
8	.473	3.642	87.207						
9	.405	3.116	90.323						
10	.381	2.930	93.253						
11	.332	2.555	95.808						
12	.284	2.183	97.991						
13	.261	2.009	100.000						
Extraction Method: Principal Component Analysis.									

Table 6: Rotated Component Matrix^a

Short Description of Variables		Component				Labeled as
		1	2	3	4	
S5	Service attitude of clearance staff	0.854				<i>Swiftiness</i>
S6	Responsiveness of clearing staff towards emerging situation	0.788				
S4	Tracking system for shipment	0.688				
S7	Air craft maintenance	0.617				
S12	Clear indication of marked and directed to destination		0.829			<i>Pre-emptiveness</i>
S11	Clear indication of container allotment		0.773			
S13	Global presence		0.694			
S10	On time availability		0.662			
S8	Damage claim service			0.815		<i>Business Tactics</i>
S9	Reasonable freight and frequency			0.781		
S1	Reputation of reliable service				0.819	<i>Vitality</i>
S2	On time delivery				0.790	

S3	Safety & security for Cargo				0.642	
Eigen values		3.897	2.278	1.440	1.132	Rotation Sums of squared Loadings
% of Variance		19.439	17.847	15.196	14.805	
Cumulative %		19.439	37.286	52.482	67.287	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.a. Rotation converged in 7 iterations.						

All the variables extracted under group 1 are related to fastness accompanying the services of freight forwarders. Therefore, factor 1 is named as ‘Swiftness’. The variables extracted under factor 2 are related to strength, hence it is named as ‘Pre-emptiveness’. The third factor is named as ‘Business tactics’ and fourth factor as ‘Vitality’. The factors thus extracted were tested for reliability. The factor swiftness scored 0.798, Pre-emptiveness scored 0.749, Business tactics scored 0.717 and Vitality scored 0.720. All the factors were found to be reliable.

Factors Influencing Freight Forwarders in Selection of Airlines:

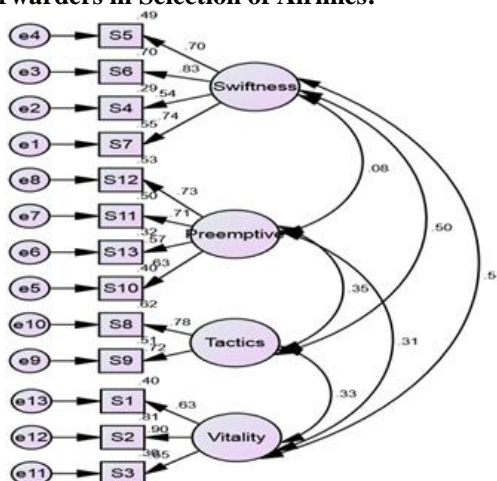


Figure 1: CFA of factors influencing freight forwarders in selection of airlines

Assessing Overall Measurement Model Fitness:

The results shown in the below table provide a quick overview of the model fit, which includes the value (346.566), together with its degrees of freedom (59) and probability value (0.000). In the table NPAR stands for Number of Parameters, and CMIN (χ^2) is the minimum discrepancy and represents the discrepancy between the unrestricted sample covariance matrix S and the restricted covariance matrix. Df stands for degrees of freedom and P is the probability value.

Table 7: AMOS output showing Model Fit

Model	NPAR	χ^2	DF	P	CMIN/DF
Default Model	32	346.566	59	0.000	5.874
Saturated Model	91	.000	0		
Independence Model	13	1557.358	78	0.000	19.966

In SEM a relatively small chi-square value supports the proposed theoretical model being tested. In this model the χ^2 value is 346.566 and is small compared to the value of the independence model (1557.358). Hence the χ^2 value is good.

Although the χ^2 seems good, it is also appropriate to check the value of χ^2 divided by df (Wheaton, Muthen, Alwin and Summers, 1977) as the χ^2 statistic is particularly sensitive to sample sizes (that is, the probability of model rejection increases with increasing sample size, even if the model is minimally false), and hence chi-square (χ^2) divided by degrees of freedom is suggested as a better fit metric (Bentler and Bonnett, 1980). It is recommended that this metric not exceed five for models with good fit (Bentler, 1989). For the current CFA model, as shown in the above table, χ^2/df was 2.849 ($\chi^2= 346.566$; $df = 59$), suggesting acceptable model fit.

The other different common model-fit measures used to assess the models overall goodness of fit are Goodness of Fit Index (GFI) obtained is 0.854, AGFI is 0.774, NFI, RFI, CFI, TLI are 0.777, 0.706, 0.806 and 0.743 respectively. RMSEA is 0.122 and RMR is 0.139. The Confirmatory factor analysis showed an acceptable overall model fit and hence, the theorized model fit well with the observed data.

The factors of ‘factors influencing freight forwarders in selection of airlines’ are tested with profile of freight forwarders through ANOVA.

H0: There is no significant difference in Swiftness factor and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement.

ANOVA							
Source of variance		Sum of Squares	df	Mean Square	F	Sig.	Result
Airport preferred	Between Groups	23.912	16	1.494	1.239	.236	NS
	Within Groups	376.301	312	1.206			
	Total	400.213	328				
Nature of the firm	Between Groups	3.267	16	.204	.809	.676	NS
	Within Groups	78.763	312	.252			
	Total	82.030	328				
Number of years of functioning	Between Groups	17.408	16	1.088	.878	.595	NS
	Within Groups	386.440	312	1.239			
	Total	403.848	328				
Agent of multiple airlines	Between Groups	2.492	16	.156	.621	.867	NS
	Within Groups	78.220	312	.251			
	Total	80.711	328				
Involvement	Between Groups	16.785	16	1.049	1.907	.019*	S
	Within Groups	171.635	312	.550			
	Total	188.419	328				

*Significant at 0.05 level NS – Not Significant

From the table it can be concluded that there is no significant difference in Swiftness factor among and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement as the p value is greater than 0.05 but the swiftness factor is significant with the 'involvement' profile as the p value is less than 0.05.

H0: There is no significant difference in Pre-emptiveness factor and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement

ANOVA							
Source of variance		Sum of Squares	df	Mean Square	F	Sig.	Result
Name of the airport	Between Groups	29.540	16	1.846	1.554	.080	NS
	Within Groups	370.672	312	1.188			
	Total	400.213	328				
Nature of the firm	Between Groups	3.828	16	.239	.954	.507	NS
	Within Groups	78.203	312	.251			
	Total	82.030	328				
Number of years of functioning	Between Groups	10.290	16	.643	.510	.942	NS
	Within Groups	393.558	312	1.261			
	Total	403.848	328				
Agent of multiple airlines	Between Groups	2.477	16	.155	.617	.870	NS
	Within Groups	78.234	312	.251			
	Total	80.711	328				
Involvement	Between Groups	18.112	16	1.132	2.074	.009*	S
	Within Groups	170.307	312	.546			
	Total	188.419	328				

*Significant at 0.05 level NS – Not Significant

From the table it can be concluded that there is no significant difference in pre-emptiveness factor and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement as the p value is greater than 0.05 but the Pre-emptiveness factor is significant with the 'involvement' profile as the p value is less than 0.05.

H0: There is no significant difference in Business tactics factor and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement

ANOVA							
Sources of Variance		Sum of Squares	df	Mean Square	F	Sig.	Result
Name of the airport	Between Groups	5.257	8	.657	.532	.832	NS
	Within Groups	394.956	320	1.234			
	Total	400.213	328				

Nature of the firm	Between Groups	2.380	8	.298	1.195	.301	NS
	Within Groups	79.650	320	.249			
	Total	82.030	328				
Number of years of functioning	Between Groups	3.151	8	.394	.315	.960	NS
	Within Groups	400.697	320	1.252			
	Total	403.848	328				
Agent of multiple airlines	Between Groups	2.426	8	.303	1.240	.275	NS
	Within Groups	78.285	320	.245			
	Total	80.711	328				
Involvement	Between Groups	12.649	8	1.581	2.879	.004*	S
	Within Groups	175.770	320	.549			
	Total	188.419	328				

*Significant at 0.05 level NS – Not Significant

From the table it can be concluded that there is no significant difference in Business tactics factor and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement as the p value is greater than 0.05 but the Business tactics factor is significant with the 'involvement' profile as the p value is less than 0.05.

H0: There is no significant difference in Vitality factor among and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement.

ANOVA							
Sources of Variance		Sum of Squares	df	Mean Square	F	Sig.	Result
Name of the airport	Between Groups	9.205	12	.767	.620	.825	NS
	Within Groups	391.008	316	1.237			
	Total	400.213	328				
Nature of the firm	Between Groups	3.216	12	.268	1.074	.381	NS
	Within Groups	78.815	316	.249			
	Total	82.030	328				
Number of years of functioning	Between Groups	13.747	12	1.146	.928	.519	NS
	Within Groups	390.101	316	1.234			
	Total	403.848	328				
Agent of multiple airlines	Between Groups	3.809	12	.317	1.304	.215	NS
	Within Groups	76.903	316	.243			
	Total	80.711	328				
Involvement	Between Groups	17.653	12	1.471	2.722	.002*	S
	Within Groups	170.766	316	.540			
	Total	188.419	328				

*Significant at 0.05 level NS – Not Significant

From the table it can be concluded that there is no significant difference in Vitality factor among and the airport preferred, nature of the firm, years of experience, type of agent employed, and Involvement as the p value is greater than 0.05 but the Vitality factor is significant with the 'involvement' profile as the p value is less than 0.05.

From the ANOVA it is concluded that there is significant difference of factors influencing freight forwarders in selection of airlines with involvement only as other profile factors are not statistically significant.

Conclusion:

The freight forwarder is so particular while selecting airline, the air line should provide various services which are affirmative for the shipment of the cargo. The services dimensions should include Swiftiness, Pre-emptiveness, Business Tactics, Business Tactics and Vitality.

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