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Transportation Carrier Selection in Small Firms: A Study of the Perceptions of Shippers

Parampal Singh and Deepinder S. Garcha

A professionalised branded service by small carrier operators and quality consciousness on the part of the shipper are lacking in the Indian trucking industry. Most small carrier operators provide similar services and charge competitive prices. The services offered by them, however, leave much to be desired. Assuming that knowledge of what the customers expect from the carriers may help them to improve the quality of their services, this study explores the perceptions of small firm shippers selected from an Indian city. The study suggests that costs, completeness of service, and the reputation of the carriers and their services are uppermost in the minds of small firms when selecting a freight carrier.

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The role of transport in an economy is both the cause and the effect of increased economic activity. Better infrastructure results in increased economic activity which, in turn, steps up demand for additional transport services. Transport accounts for a large part of total distribution costs, varying between 3 per cent and 30 per cent of the selling price, depending upon the product being shipped. A study conducted by the Planning Commission,[1] in January 1987, suggested that in India out of the total logistic costs, about 35 per cent is spent on transportation, which is 3.5 per cent of the nation's gross national product (GNP); it is 8 per cent in the United States.[2]

Effective management of the transport function can lead to enhanced profitability. Computerisation of trucking businesses can bring in improved efficiency in this sector,[3] which is lacking even in advanced countries.[4] The trucking business is managed in a complicated manner in

India, with very few companies owning their own fleet. Most truck operators own less than five trucks[5] and offer their services to trucking companies through a market controlled by brokers. This situation is not different from that in the United Kingdom, where over 50 per cent of haulage companies have only one vehicle, while 85 per cent have less than five vehicles.[6] Thus, while macro transport variables in India are quite similar to other advanced countries, much work is still left to be done on the management of the transport function in Indian industry. Effective management would improve the performance of the trucking industry and leave it in a better condition to address the competitive challenges of the future.

It is now widely recognised that differences exist in the service levels demanded by various transportation customers. Several studies have highlighted the differences among users of transportation carriers.[7] Stephenson and Vann, for instance, have suggested that consistency of time delivery influences air cargo carrier selection.[8] Collison has come up with a list of factors having the greatest influence in carrier selection. These are: timeliness of service, facilities and equipment, and traffic services.[9] Stock and Lalonda compared the data of 1975 with 1985 about the source of information in the selection of a mode, and concluded that past experience with a mode was the most relevant source.[10] According to many other authors, cost incurred, service variables, company image, co-operation in rate determination and reliable pickup are the most important factors influencing carrier selection decisions.[11] A study carried out by Coulter et al.[12] has dealt systematically with the dimensions of individual transport needs. The factors which they stress are: reliability of performance, insurance of service provision, customer services, personalising factors and handling factors.

All these studies, however, relate to the western context. Hardly any systematic studies have been undertaken to explore the factors influencing carrier selection decisions of Indian firms. Assuming that the contextual setting may make a difference, we intend to explore, in this paper, the carrier attributes influencing mode selection decisions in the small scale industry in India. An effort has also been made to study the underlying dimensions of the perceptions of carrier users.

Research Methodology

Small business firms using road transport services (common or contract carriers) in Jalandhar (Punjab) constitute the universe of this study. To find out the attributes affecting carrier selection decision, a list of thirty-

four attributes was prepared by consulting previous studies. From this list, twenty-four carrier attributes were selected by consulting firms providing transportation services and managers dealing with transportation in small firms.

The respondents were instructed to rate the selected attributes on a five-point scale, ranging from 'very important' to 'quite unimportant'. The highest weightage of 5 was assigned to the attribute 'very important'; 4 to the attribute 'quite important'; 3 to the attribute 'important'; 2 to the attribute 'unimportant'; and 1 to the attribute 'quite unimportant'. Another section of the questionnaire dealt with the frequency of the use of carriers, volumes shipped, origin and destination points, types of carriers being used, and personal particulars of the firm.

The respondents also helped in developing concise operational definitions for each of the twenty-four carrier selection attributes. These are listed here:

1. Financial stability—whether the carrier is financially sound.

2. Carrier coverage—the geographical area covered by the carrier, i.e., the type of permit the carrier has.

3. Reliable pickup service—the carrier's commitment to time, place and method of picking up the shipper's goods.

4. Reliable transit time—consistency in time taken from the shipper's place to the consignee's place or vice versa.

5. Speed of transition—time elapsed to ship the goods between the origin and destination points.

6. Cost—cost or price charged by the carrier for providing transportation services.

7. Price flexibility—ability of the shipper to have some say in price fixation.

8. Carrier reputation—the perceived reputation of the carrier in providing services.

9. Familiarity with carrier—the shipper's knowledge or previous experience with the carrier.

10. Claims service—is it easy for the shipper to claim losses or damages?

11. Billing service—the carrier's method of charging for the services rendered.

12 Loss and damage history—the extent to which the carrier is prone to damage the goods.

13 & 14. Domestic and international distribution for the type of services the carrier is providing.

15. Quality of drivers—reputation of the carrier's drivers.

16. Quality of brokers—reputation of the carrier's sales persons.

17. Quality of customer service—the perceived quality of the carrier's handling of the shipper's freight.

18. Quality of despatches—the way and condition in which the carrier hands over the goods to the consignee.

19. Completeness of service—carrier's ability to provide some additional services at some charge to complete all the formalities, right from taking possession of the goods to handing over the goods.

20. Loading/unloading facilities—does the carrier have proper materials handling equipment to complete loading and unloading of goods?

21. Availability of container facility—mainly used for international trade.

22. Diversion and reconsignment—does the shipper have the facility to change the destination or consignee of goods once the carrier has reached the destination, at some charge?

23. Detention facility—refers to retaining the carrier's equipment beyond an allowed free time.

24. Handling capability—the ease with which the carrier is able to handle different types of freight.

The sample consisted of fifty small firms, selected by using the convenience judgemental sampling procedure. The owners of the firms or the managers dealing with the transportation function were surveyed personally to collect the desired information. Every care was taken to select the respondents from a variety of organisations manufacturing different products. The information thus obtained was analysed with the help of the Kendall co-efficient of concordance, chi-square and factor analysis.

Sample Description

The sample consisted mainly of sole proprietary firms (82 per cent), those which have been in business for less than ten years (70 per cent), those producing industrial products (52 per cent), and those having a monthly sale of upto Rs. 2 lakh (88 per cent). The frequency of use of carriers was thrice in a week for raw materials and finished goods and 85 per cent of

these movements were generally taken with less than truck load (LTL).
The origin points of 84 per cent of these movements were within the city
and 66 per cent of the destination points were outside the city or state. All
the responding firms used common carriers as one mode of transport.
Movements inside the city were done by rickshaws, hand carts and bullock
carts (78 per cent).

Research Findings

To find out which carrier attributes influenced the carrier selection
decision, the respondents were asked to rate the twenty-four carrier
attributes to their importance in influencing the carrier selection decision.
It can be assumed that the age of the firms, the products produced by them
and their monthly sales may affect their ratings of the carrier attributes.
This assumption was tested with the help of the Kendall co-efficient of
concordance; it was further tested with the help of chi-square. Tables 1,
2 and 3 show age-wise, product-wise and sales-wise classifications of
carrier selection attributes. The value of the Kendall co-efficient of
concordance shows reasonable correlation among firms producing dif-
ferent products (0.78) and low correlation among firms from different age
groups (0.57) and firms with different sales turnover (0.59); but in all the
cases chi-square test leads to the rejection of the assumption. Hence, it is
clear that age, products produced and monthly sales of the firm do not
materially influence the carrier selection criteria used by small firms.

What then are the factors that weigh heavily with the shippers in
selecting a carrier? To determine this, the weighted average scores of these
attributes, irrespective of the age, product lines and monthly sales volume,
were worked out. These are given in Table 4. It is clear from this table
that cost, completeness of service, claims service, carrier reputation,
familiarity with carrier, and price flexibility were the attributes considered
quite important to *very important* (weighted average ratings of 4 and
above). The attributes considered close to *quite important* in influencing
carrier selection decisions were: quality of despatches, reliable pickup
services, reliable transit time, loss/damage history, billing service, and
speed of transit (mean scores ranging between 3.62 to 3.94).[13] Carrier
attributes like international distribution and availability of container
facility had very low weighted average scores of 1.36 and 1.76 respec-
tively.

TABLE 1

Average Weighted Rating of Carrier Attributes on the Basis of Age of the Firm

Carrier Attributes	Up to 5 years	5 to 10 years	10 to 15 years	More than 15 years
1. Financial stability	2.76	2.92	3.40	3.81
2. Carrier coverage	2.92	3.22	3.80	4.20
3. Reliable pickup service	3.64	1.77	3.80	4.20
4. Reliable transit time	3.38	3.72	3.80	4.60
5. Speed of transition	3.76	.3.40	3.80	3.81
6. Cost	4.81	4.22	4.50	3.81
7. Price flexibility	4.38	4.22	4.50	3.60
8. Carrier reputation	4.38	4.18	3.30	4.60
9. Familiarity with carrier	4.30	4.04	4.30	3.60
10. Claims service	4.40	4.27	4.00	4.20
11. Billing service	3.80	3.54	3.90	3.60
12. Loss/damage history	4.07	3.45	3.60	3.81
13. Domestic distribution	2.69	2.95	3.10	3.40
14. International distribution	1.46	1.72	1.20	2.20
15. Quality of drivers	2.76	2.50	2.90	1.01
16. Quality of brokers	3.23	3.27	3.80	3.81
17. Quality of customer service	4.07	3.80	4.20	4.41
18. Quality of dispatches	3.30	3.18	3.50	3.42
19. Completeness of service	3.92	3.77	4.70	4.41
20. Loading/unloading facilities	3.00	3.04	3.00	3.01
21. Availability of container facility	1.60	1.09	1.60	2.62
22. Diversion and reconsignment	2.15	2.18	3.10	1.00
23. Detention facility	2.46	2.50	3.30	3.81
24. Handling capability	3.07	3.13	3.30	3.81
n =	13	22	10	5

(The Kendall Co-efficient of Concordance: W = 0.57; Chi-square = 52.44; d.f. = 23, significant at 5 per cent level of significance).

TABLE 2

Average Weighted Rating of Carrier Attributes on the
Basis of Product Produced by the Firm

Carrier Attributes	Industrial Products	Sports Goods & Wear	Daily Need Products	Consumer Products	Rubber Products	Misc. Products
1. Financial stability	3.19	3.62	3.16	3.50	3.00	3.20
2. Carrier coverage	3.50	3.83	3.83	4.50	3.25	3.20
3. Reliable pickup service	4.92	4.00	2.50	4.00	4.00	3.60
4. Reliable transit time	3.73	4.22	4.16	4.25	4.00	3.60
5. Speed of transition	3.46	3.62	3.30	4.20	3.50	3.60
6. Cost	4.20	4.40	4.30	4.75	4.50	4.60
7. Price flexibility	4.15	3.83	4.00	4.50	4.00	4.20
8. Carrier reputation	4.15	4.60	4.00	4.00	4.25	4.20
9. Familiarity with carrier	4.50	4.22	4.00	3.75	4.00	5.00
10. Claims service	4.46	4.60	4.00	3.50	4.25	3.00
11. Billing service	3.69	3.62	3.50	3.50	4.50	2.80
12. Loss/damage history	3.57	4.00	3.50	3.75	3.00	3.20
13. Domestic distribution	2.76	3.00	2.80	2.75	2.50	2.40
14. International distribution	1.30	2.61	1.60	1.25	1.25	1.40
15. Quality of drivers	3.00	3.00	3.30	3.75	2.75	3.00
16. Quality of brokers	3.73	3.83	3.60	3.25	3.25	3.80
17. Quality of customer service	3.96	4.22	4.00	3.75	4.00	4.20
18. Quality of dispatches	3.30	2.61	3.50	3.25	3.25	3.40
19. Completeness of service	4.03	4.80	4.00	3.50	4.25	4.20
20. Loading/unloading facilities	2.80	3.00	2.80	3.00	3.25	3.40
21. Availability of container facility	1.50	2.20	2.00	1.75	1.25	1.40
22. Diversion and reconsignment	2.34	2.80	2.80	2.50	2.00	2.20
23. Detention facility	2.69	3.40	3.00	2.50	3.00	2.60
24. Handling capability	3.19	3.62	3.60	3.50	2.75	2.80
n =	26	5	6	4	4	5

(The Kendall Co-efficient of Concordance: $W = 0.78$; Chi-square $= 107.64$; d.f. $= 23$, significant at 5 per cent of significance).

TABLE 3
Average Weighted Rating of Carrier Attributes on the Basis of Sale of the Firm

Carrier Attributes	Up to 1 lakh	1 to 2 lakhs	2 to 5 lakhs	5 to 10 lakhs	More than 10 lakhs
1. Financial stability	3.17	3.13	4.00	3.50	3.13
2. Carrier coverage	3.44	3.30	4.00	4.50	3.30
3. Reliable pickup service	3.82	3.86	4.50	4.10	3.86
4. Reliable transit time	4.20	3.86	4.50	2.50	3.86
5. Speed of transition	3.68	3.53	4.25	4.10	3.53
6. Cost	2.48	4.60	4.75	2.50	4.60
7. Price flexibility	4.31	3.86	4.50	2.50	4.60
8. Carrier reputation	4.44	4.00	4.50	4.10	4.00
9. Familiarity with carrier	4.27	3.06	3.75	4.10	3.06
10. Claims service	4.40	4.20	4.00	4.10	4.20
11. Billing service	3.80	3.60	3.75	3.00	3.60
12. Loss/damage history	3.62	3.60	4.50	3.50	3.60
13. Domestic distribution	2.75	2.73	3.50	4.10	2.73
14. International distribution	1.60	1.40	1.25	1.00	1.40
15. Quality of drivers	2.79	3.00	3.25	1.50	3.00
16. Quality of brokers	3.60	3.60	3.50	4.10	3.60
17. Quality of customer service	4.31	4.00	3.50	4.50	4.00
18. Quality of dispatches	3.20	3.13	3.50	4.50	3.13
19. Completeness of service	4.31	4.53	4.25	5.00	4.53
20. Loading/unloading facilities	3.00	3.33	3.25	3.50	3.33
21. Availability of container facility	1.57	1.53	3.75	1.00	1.53
22. Diversion and reconsignment	2.31	2.60	3.75	3.00	2.60
23. Detention facility	2.58	2.86	4.00	4.10	2.86
24. Handling capability	3.24	2.86	4.25	4.10	2.86
n = 50	26	15	4	2	3

(The Kendall Co-efficient of Concordance: W = 0.59; Chi-square = 67.85; d.f. = 23, significant at 5 per cent level of significance.

TABLE 4
Weighted Average Scores of Attributes in Carrier Selection

S.No.	Carrier Attributes	Score
1.	Financial stability	3.22
2.	Carrier coverage	2.92
3.	Reliable pickup service	3.82
4.	Reliable transit time	3.82
5.	Speed of transition	3.62
6.	Cost	4.34
7.	Price flexibility	4.00
8.	Carrier reputation	4.24
9.	Familiarity with carrier	4.08
10.	Claims service	4.26
11.	Billing service	3.60

Table 4 contd.

S.No.	Carrier Attributes	Score
12.	Loss/damage history	3.72
13.	Domestic distribution	2.98
14.	Information distribution	1.36
15.	Quality of drivers	2.70
16.	Quality of brokers	3.54
17.	Quality of customer service	3.32
18.	Quality of despatches	3.94
19.	Completness of service	4.26
20.	Loading/unloading facilities	3.08
21.	Availability of container facility	1.76
22.	Diversion and reconsignment	2.44
23.	Detention facility	2.02
24	Handling capability	3.14
	n = 50	50

Relationship between Attributes

Table 5 shows the correlation co-efficients between the carrier attributes selected for this study. The table depicts high positive correlation (+0.84) between cost and price flexibility, which is quite understandable as the cost of the carrier depends on the flexibility the firm would be having in determining the price of the service. The attribute 'reliable pickup service' has a high positive correlation with the variables of transport time (0.71) and diversion and reconsignment facility (0.71). This suggests that the speed of the carrier matters when pickups by the carrier are reliable. No correlation existed between price flexibility and carrier coverage; price flexibility and reliable transit time; quality of customer services and cost; quality of despatches and price flexibility; and carrier coverage and familiarity with carrier.

The table further indicates reasonable correlation between many variables. It is more than +0.55 for twenty-three variables; for four combinations it is even more than +0.70, which suggests the possibility of several variables measuring the same underlying dimension.

We can understand these underlying dimensions by applying factor analysis. Table 6 shows the factor loading of eight factors extracted by using the factor analysis technique. The eigen value (sum of the squares) indicates the relative importance of each factor in accounting for the variance associated with the set of variables being analysed. The eigen value for factor I is 8.27, which gets reduced to 2.29 for factor II, and continuously declines upto 0.97 for factor VIII. The total variance explained by all the eight factors put together is 73.72 per cent, which shows how well all the eight factors, taken together, represent the explainability.

TABLE 5

Correlation among the Carrier Selection Attributes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1.	1.00																							
2.	.56	1.00																						
3.	.57	.51	1.00																					
4.	.41	.34	.71	1.00																				
5.	.56	.34	.52	.49	1.00																			
6.	.24	-.02	.42	.48	.53	1.00																		
7.	.07	.00	.26	.00	.35	.84	1.00																	
8.	.32	.30	.48	.37	.35	.26	.14	1.00																
9.	-.35	-.38	-.16	-.06	-.07	.02	.01	.06	1.00															
10.	.23	.16	.41	.34	.20	.21	.12	.47	.02	1.00														
11.	.21	.02	.22	.22	.17	.24	.26	.32	.17	.47	1.00													
12.	.32	.20	.48	.18	.39	.30	.21	.39	.04	.39	.24	1.00												
13.	.41	.43	.56	.20	.45	.31	.18	.52	.01	.28	.05	.54	1.00											
14.	.26	.12	.16	.17	.08	.12	.01	.14	.02	.27	.07	.30	.10	1.00										
15.	.50	.24	.41	.46	.39	.27	.10	.27	.25	.13	.25	.26	.13	.22	1.00									
16.	.38	.34	.62	.40	.51	.19	.06	.43	.21	.44	.15	.48	.42	.34	.51	1.00								
17.	.34	.40	.31	.23	.12	.00	-.15	.44	-.09	.33	.07	.17	.30	.31	.41	.50	1.00							
18.	.51	.49	.53	.16	.47	.04	.00	.28	-.13	.16	-.02	.27	.49	.03	.26	.47	.39	1.00						
19.	.19	.37	.45	.38	.20	-.11	-.11	.35	.04	.36	.12	.13	.20	.13	.21	.50	.39	.39	1.00					
20.	.22	.05	.38	.07	.31	.25	.15	.14	-.11	.39	.10	.34	.24	.13	.24	.39	.23	.52	.39	1.00				
21.	.64	.31	.58	.56	.48	.24	.10	.34	-.12	.18	.28	.26	.27	.38	.51	.36	.16	.42	.29	.27	1.00			
22.	.54	.38	.71	.41	.59	.44	.22	.58	-.01	.32	.13	.48	.65	.33	.31	.54	.27	.47	.35	.45	.59	1.00		
23.	.49	.52	.66	.43	.45	.16	.03	.58	-.09	.45	.16	.43	.65	.39	.20	.55	.38	.54	.50	.33	.58	.82	1.00	
24.	.57	.30	.55	.22	.50	.17	.07	.57	.05	.23	.19	.68	.60	.33	.38	.46	.32	.40	.24	.24	.48	.59	.58	1.00

TABLE 6
Factor Loading of Carrier Attributes
(Principal Factor Matrix)

Variable number	Factors								h^2
	I	II	III	IV	V	VI	VII	VIII	
1.	.69	−.14	−.37	.19	−.26	.23	.11	−.01	.81
2.	.56	−.42	−.34	.00	−.24	−.12	.01	−.05	.68
3.	.88	.06	−.18	.04	.04	−.18	−.02	−.11	.85
4.	.61	−.04	−.10	.53	−.02	−.30	−.13	−.06	.78
5.	.73	.27	−.32	.04	.14	−.06	−.07	−.20	.77
6.	.43	.78	−.15	−.08	−.06	.11	.10	−.03	.85
7.	.24	.79	−.17	−.15	−.07	.01	.19	−.02	.78
8.	.64	.00	−.28	−.12	−.31	−.23	−.14	−.11	.68
9.	−.10	.28	.61	−.01	.21	.10	−.46	−.34	.84
10.	.52	.04	.49	−.09	−.22	−.04	−.39	.15	.74
11.	.31	.35	.39	.27	−.31	−.21	.29	−.40	.82
12.	.58	.19	.18	−.30	−.13	.21	−.05	.04	.57
13.	.65	.00	−.09	−.52	−.20	.00	−.26	−.08	.80
14.	.37	−.05	.29	.18	−.09	.51	−.12	.57	.86
15.	.54	.04	.03	.50	.08	.38	.10	−.34	.82
16.	.73	−.11	−.31	−.03	.16	.20	−.05	−.26	.78
17.	.49	−.45	.26	.01	−.15	.24	.20	−.20	.67
18.	.62	−.32	−.24	−.28	.28	.09	.11	−.17	.75
19.	.52	−.39	.26	.04	.32	−.34	.14	.01	.74
20.	.49	.03	.09	−.27	−.52	.11	.48	.13	.85
21.	.69	.00	−.16	−.41	.04	.11	−.01	.21	.73
22.	.83	.09	−.04	−.17	.07	.00	−.25	.20	.84
23.	.81	−.20	.05	−.17	−.03	−.12	−.23	−.28	.87
24.	.42	.32	.00	.24	.41	−.23	−.14	.27	.65
Eigen values:									
	8.27	2.29	1.62	1.44	1.05	1.05	1.01	0.97	
% of variance:									
	34.45	9.54	6.75	6.00	4.37	4.37	4.20	4.04	
Cumulative variance:									
	34.45	43.99	50.74	56.74	61.11	65.48	69.68	73.72	

The factor loading pattern, however, is not very clear from this table as there are thirteen variables which load high in more than one factor (these have been underlined in the table). Based on these factor loadings, interpretation is difficult and less meaningful. The solution, therefore, has been orthogonally rotated using the varimax rotational method. The factor loadings of the rotated matrix have been presented in Table 7.

The total amount of variance extracted as shown in Table 7 is 74.02 per cent, which is quite close to the variance extracted by the unrotated solution. The factor loading patterns are somewhat more interpretable, unlike that of the unrotated factor matrix (but for the factor loading pattern of variables 1, 16 and 18).

TABLE 7
Factor Loading of Carrier Attributes
(Orthogonally Rotated [Varimax Rotation] Matrix)

Variable number	Factors								
	I	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	h^2
1.	.37	.14	.03	.16	.00	.55	.54	.18	.81
2.	.48	−.18	.04	.14	.00	.27	.55	−.09	.70
3.	.56	.20	.16	.50	.19	.35	.22	−.09	.85
4.	.19	.08	.28	.68	.12	.38	.12	−.04	.74
5.	.43	.42	−.04	.47	.14	.36	.12	−.15	.77
6.	.18	.87	.12	.15	.05	.11	−.02	.05	.84
7.	.07	.87	.13	.06	.05	−.03	.00	−.05	.80
8.	.64	.01	.47	.17	−.05	.14	−.05	.00	.69
9.	.06	.00	.02	.01	−.10	.09	−.91	.00	.85
10.	.27	.04	.79	.04	.28	.00	.06	.14	.80
11.	−.03	.25	.74	.14	−.07	.16	−.05	.02	.67
12.	.56	.29	.19	−.03	.17	.13	−.08	.27	.56
13.	.88	.17	.00	.00	.07	.04	.06	.00	.81
14.	.13	.03	.10	.11	.04	.15	.00	.89	.85
15.	.01	.13	.09	.23	.08	.85	−.03	.12	.81
16.	.50	−.04	.18	.15	.35	.53	−.22	.10	.76
17.	.34	−.29	.28	−.18	.23	.52	.10	.13	.66
18.	.51	−.06	−.17	.08	.53	.33	.24	−.11	.76
19.	.25	−.40	.31	.39	.49	.12	.03	−.09	.73
20.	.12	.19	.09	.10	.88	.08	.06	.11	.86
21.	.22	.09	.03	.57	.03	.40	.25	.35	.73
22.	.70	.20	.03	.43	.21	.10	.06	.25	.83
23.	.74	−.10	.16	.39	.19	.03	.16	.27	.88
24.	.05	.21	.04	.73	.20	−.05	−.11	.12	.64
Eigen values:									
	3.94	2.64	1.76	2.46	1.72	2.34	1.66	1.22	
% of variance:									
	16.41	11.00	7.30	10.25	7.16	9.87	6.91	5.12	
Cumulative variance:									
	16.41	27.41	34.71	44.95	52.12	61.99	68.99	74.02	

Further the communalities of principal component solution and varimax rotation are almost the same. Here factor I accounts for 16.41 per cent of the variance, factor II for 11 per cent and so on until it touches 5.12 per cent variance in factor VIII.

In order to obtain an interpretation of the results, we further examined the rotated factors,[14] as shown in Table 8. Factor VIII loads high only on one factor, i.e., international distribution, as there were only three firms which were in the export business.

TABLE 8
Interpretation of Factors

Variables	Attributes	Loading
Factor I		
(Basic Services)		
13.	Domestic distribution	.88
23.	Detention facility	.75
22.	Diversion and reconsignment	.71
8.	Carrier reputation	.64
3.	Reliable pickup service	.56
12.	Loss/damage history	.56
Factor II		
(Pricing Factor)		
6.	Cost	.87
7.	Price flexibility	.87
Factor III		
(Documentation)		
10.	Claims service	.79
11.	Billing service	.74
Factor IV		
(Timely Deliveries)		
24.	Handling capability	.73
4.	Reliable transit time	.68
21.	Availability of container facility	.57
5.	Speed of transition	.47
Factor V		
(Complete Package)		
20.	Loading/unloading facilities	.88
18.	Quality of despatches	.53
19.	Completeness of service	.49
Factor VI		
(Quality of Actual Service Providers)		
15.	Quality of drivers	.85
16.	Quality of brokers	.53
17.	Quality of customer service	.52
Factor VII		
(Confidence in Carrier)		
9.	Familiarity with carrier	−.91
2.	Carrier coverage	.55
1.	Financial stability	.54
Factor VIII		
(International Distribution)		
14.	International distribution	.89

Conclusions

The foregoing discussion throws some light on the attributes influencing carrier selection decisions and underlying perceptions of the small firms using either common or contract carriers. Carrier attributes like cost, completeness of service, familiarity with the carrier and price flexibility influence carrier selection decisions the most. Quality of despatches and of service, claims service, reputation of the carrier, reliable pickup service, reliable transit time, loss and damage history, billing service and speed of transition are the next set of important attributes while selecting a carrier. Attributes like international distribution and availability of container facilities do not seem to have much influence on carrier selection as not many of the small firms in the sample are engaged in international trade and the shipment size was less than truck load. The carrier selection attributes in small firms do not vary according to their age, monthly sales or type of product produced by them.

The factors summarising the dimensions of the perceptions of small scale users of transport services are:

1. Basic services
2. Pricing factors
3. Documentation
4. Timely deliveries
5. Complete package
6. Quality of service providers
7. Confidence in carrier
8. International distribution

Excessive competition exists among the trucking companies and operators, which will become stiffer in the coming years, thus making it compulsory for carriers to recognise the need of users and serve them in an innovative manner—no doubt at a profit. The carriers can segment their markets commodity-wise, area-wise, firm size-wise, etc., and prepare marketing strategies on the basis of the factors suggested by this study. Moreover, the carriers must become experts in marketing their services in order to survive in a highly competitive environment.

The Indian transportation sector, or any other service oriented industry for that matter, requires human resources which appreciate the need for providing better services. Unfortunately, this human resource—drivers, brokers, labour engaged in loading and unloading of goods, etc., is in bad

shape in the road transport sector. This makes it imperative for the managements of these companies to invest both in men and machines.

The findings of this study are substantially supported by other studies, but they need to be tested for shippers from large firms.

Notes

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13. Similar findings have been reported in works cited under notes 10 and 11 above

14. The factors labelled are different from factors suggested by Coulter et al., 'Freight Transportation Carrier Selection Criteria' (n. 12 above).