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The Relative Efficiency in the Blending of Strategic Dimensions Utilized in the Generation of Customer Satisfaction in the LTL Motor Carrier Industry

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Customer Satisfaction

- Chow and Poist (1984), McGinnis (1990), Kleinsorge et al. (1991), Lambert et al. (1993), Holcomb and Manrodt (2000), and Premeaux (2002):
  - performance
  - value
  - information technology
  - customer service
  - equipment and operations

Quest for Quality Survey

- Performance
  - on-time delivery and pick-up, consistent and dependable schedules and transit times, and equipment availability
- Value
  - competitive rates, prices commensurate with required service levels, and the simplicity of pricing
- Information technology
  - ability to trace and track shipments and capabilities related to EDI, the Internet, and electronic commerce

Quest for Quality Survey

- Customer service
  - the abilities to promptly settle claims, trace and expedite shipments, and solve problems promptly and courteously
- Equipment and operations
  - the availability of equipment and its condition, the carrier's safety record, and the incidence of loss and damage claims

Kano Model

- Must have, linear satisfier, delighter, and indifferent customer needs

- The Quest for Quality Survey recognizes the phenomena described by the Kano model and seeks to capture it by the weighted score methodology.

Seven Dimensions – Strategic Orientation of LTL Motor Carriers

- Smith et al. (1992) captured a carrier's focus on cost by measuring total operating expenses per mile.
- Corsi and Grimm (1989) investigated the related dimension of efficiency by examining annual miles per truck.
- A carrier's ability to charge a premium price for trucking services is reflected in the dimension Corsi et al. (1991) measured by total LTL revenue per ton.
- Scheraga et al. (1994) measure a carrier's LTL niche focus by the percentage of LTL revenue as a percentage of total revenue.

Seven Dimensions – Strategic Orientation of LTL Motor Carriers

- Scheraga et al. (1994) investigated the impact of a motor carrier's financial mobility on its performance. This dimension captures the amount of risk assumed by a motor carrier in its management of its capital resources. The measure utilized to capture this dimension is the total debt to equity ratio.
- Smith et al. (1990) and Corsi et al. (1991) measure the service dimension by average employee compensation. They argue that higher paid employees should provide customers with better service.
- The dimension of size, reflecting economies of scale and scope, as discussed by Child (1974) and Scheraga et al. (1994) is represented by total operating revenues.

Proposition One

- Motor carriers in the sample of this study had targeted particular assessed levels of the five critical areas found in the Quest for Quality Survey and had chosen strategic orientations (combinations of levels or intensities of strategic dimensions) that most efficiently achieved said levels.

Proposition Two

- The diversity of strategic orientations of motor carriers in the sample reflects the fact that some carriers in the sample were generating levels of the five critical areas, as evaluated by customer, with inefficient combinations of strategic orientations. If the latter is the case, a restructuring of the strategic orientations of inefficient motor carriers should lead to higher levels of performance on the critical areas of the survey.

Table 1a
Sample Membership

NAME
AAA Cooper Transportation
ABF Freight Systems
Averitt Express Inc.
Central Freight Lines
Estes Express Lines
Jevic Transportation Inc.
New England Motor Freight Inc.
New Penn Motor Express Inc.
Old Dominion Freight Line Inc.
Overnite Transportation Company
Pitt Ohio Express LLC
Roadway Express Inc.
Saia Motor Freight Lines Inc.
Southeastern Freight Lines Inc.
USF Dugan Inc.
USF Holland Inc.
USF Reddaway Inc.
Ward Trucking Corporation
Watkins Motor Lines Inc.
Wilson Trucking Corporation
Yellow Transportation Inc.

Table 1b
Sample Motor Carriers – Quest for Quality Winners

NAME	2002	2001	2000	1999
AAA Cooper Transportation	X	X	X	X
ABF Freight System Inc.	X	X		X
Averitt Express Inc.	X	X	X	X
Jevic Transportation Inc.		X		X
New Penn Motor Express Inc.	X	X	X	X
Pitt Ohio Express LLC	X	X	X	X
Roadway Express Inc.	X	X	X	X
Saia Motor Freight Line Inc.	X			
Southeastern Freight Lines Inc.	X	X	X	X
USF Holland Inc.	X	X	X	X
USF Reddaway Inc.	X	X	X	X
Ward Trucking Corporation	X	X	X	X
Watkins Motor Lines Inc.		X	X	X
Yellow Transportation Inc.	X	X	X	X

Table 5
Focus Profiles of Sample LTL Motor Carriers
X = More Than One Standard Deviation From Mean

LTL Carrier	COST	PRICE	EFFICIENCY	NICHE	SERVICE	SIZE	RISK
AAA							
ABF		X			X		
AVERITT	X		X				
CENTRAL							X
ESTES	X						
JEVIC	X						
NEMF							
NPME					X		
OLD DOM.							
OVERNITE							
PITT OHIO			X				X
ROADWAY		X			X	X	
SAIA							
SOUTHEASTERN							
USF DUGAN							X
USF HOLLAND					X		
USF REDDAWAY							
WARD	X		X				
WATKINS		X	X				
WILSON							
YELLOW		X			X	X	

Table 6
Tukey's Studentized Range Test
Differences in Operating Ratios by Quality Score Groups
(If Quality Score ≥ Median then Group =2; Else Group = 1)

(Comparisons Significant at the 0.05 Level are Indicated by *)**

Group	Mean	Significance
2	93.23	***
1	96.18	***

Table 7
DEA Efficiency Scores of Motor Carriers

NAME	IOTA
AAA Cooper Transportation	0.85
ABF Freight System Inc.	0.79
Averitt Express Inc.	**1.00**
Central Freight Lines Inc.	0.83
Estes Express Lines	**1.00**
Jevic Transportation Inc.	**1.00**
New England Motor Freight Inc.	**1.00**
New Penn Motor Express Inc.	**1.00**
Old Dominion Freight Line Inc.	0.92
Overnite Transportation Company	0.77
Pitt Ohio Express LLC	**1.00**
Roadway Express Inc.	0.57
Saia Motor Freight Line Inc.	0.86
Southeastern Freight Lines Inc.	**1.00**
USF Dugan Inc.	0.95
USF Holland Inc.	0.94
USF Reddaway Inc.	0.91
Ward Trucking Corporation	**1.00**
Watkins Motor Lines Inc.	**1.00**
Wilson Trucking Corporation	**1.00**
Yellow Transportation Inc.	0.74

Table 8
Tukey's Studentized Range Test
Differences in Quality Scores by Input Efficiency (IOTA) Groups
(Group 3: IOTA = 1.00)
Group 2: 0.90 ≤ IOTA < 1.00
Group 1: IOTA < 0.90)

(Comparisons Significant at the 0.05 Level are Indicated by *)**

Group Comparison	Difference between Means	Simultaneous 95% Confidence Limits	Significance
1 – 2	-0.443	-4.768 –- 3.883	
1 – 3	-4.007	-7.408 – -0.606	***
2 – 3	-3.564	-7.647 – 0.519	

Table 9
Regression Results - Tobit Model
Dependent Variable: Transformed IOTA 2000 = (1/IOTA 2000)-1
Standardized Independent Variables

Variable	Estimate	Std. Error	Chi-Square	Pr > Chi-Square
Intercept	0.0450	0.0307	2.1425	0.1433
Cost	0.0601	0.0599	1.0061	0.3158
Price	**0.0841**	**0.0464**	**3.2854**	**0.0699**
Efficiency	**-0.1152**	**0.0651**	**3.1351**	**0.0766**
Niche	-0.0009	0.0434	0.0004	0.9833
Service	-0.0155	0.0263	0.3495	0.5544
Size	**0.1146**	**0.0360**	**10.1430**	**0.0014**
Risk	**0.0697**	**0.0300**	**5.3806**	**0.0204**