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THE IMPACT OF DOWNSIZING ON LOGISTICS PERFORMANCE AND EMPLOYEES IN SHIPPER FIRMS

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Firms that downsize hope to achieve improvements in performance and to avoid adverse impacts on employees. This article compares the changes in logistics performance and logistics employee fulfillment for shippers that have downsized with those that have not. Two major conclusions of this research are: (1) Respondent firms that have downsized perceive that they have substantially improved their logistics performance, but no more so than respondent firms that have not downsized; and (2) Stress, morale, and loyalty have worsened for logistics employees in downsized respondent firms, both in an absolute sense and relative to respondent firms that have not downsized.

INTRODUCTION

The importance of downsizing on American life is evident from the coverage it has received of late in both the trade and popular business press (Blohowiak 1996; Bernstein 1997; Heller 1997). Downsizing is often the result or by-product of the application of total quality management (TQM) techniques, particularly process reengineering efforts. The primary objective of downsizing is to improve productivity through cost reduction (Chitwood 1997). The downside risk is the negative effect

it may have on the morale and loyalty of those employees who remain with the firm because it requires major changes for the firm's employees (Kets de Vries and Balasz 1997; Shaw and Power-Barrett 1997). For instance, downsizing may change the relationship between employees and their employers, the nature of the employees' work (e.g., job scope and design), and the expectations of the employees by their corporations (Dreilinger 1994). Thus, firms that downsize hope to achieve favorable changes in performance and to avoid the adverse impacts on their employees.

The purpose of this article is to provide an empirical investigation of the impact of downsizing on the logistics performance and logistics employees of shipper firms. It is organized in the following manner: first, background on downsizing in the logistics area is provided; second, research propositions are delineated; third, the research design is specified; fourth, the results are presented; and lastly, conclusions and implications are discussed.

DOWNSIZING IN LOGISTICS

The logistics functional area of business has experienced TQM and downsizing on a large-scale basis (Schott and Degnan 1996; Rheem 1997). Three fundamental reasons for this trend in logistics come to mind. First, the logistics area of business was a logical candidate for TQM and downsizing because of the economic deregulation of freight transportation. The highly regulated transportation environment was akin to full employment in these industries and provided for a very stabilized, relatively high paying, and steady work environment. Shippers also needed to employ a large number of workers to manage the transportation process. The freedoms granted by deregulation allowed both shippers and carriers to change their operations. When deregulation first occurred, there were indications of the forthcoming downsizing. One earlier study showed that responding transportation and logistics practitioners were experiencing downsizing and increased stress in their job environment. However, the survivors also thought that deregulation had improved the status and role of a career in transportation and distribution management (Jerman and Anderson 1989).

Second, the strong customer-orientation of quality programs in conjunction with logistics' key role in customer service makes the reengineering aspect of TQM a very good candidate for application to logistics. The logistics process is what connects customer expectations to the products or services they receive. It ensures, or fails to ensure, that

services meet or exceed customer expectations. Dependability, speed and accuracy are the major customer service dimensions of logistics. Reengineering, also known as process redesign, is a type of continuous improvement with the potential to dramatically improve the quality and speed of work and to reduce its costs by fundamentally changing the process by which work gets done. Redesigning the process usually entails changes in job design and work force requirements.

Finally, logistics is a very information-intensive set of activities or functions. The dramatic changes in information technology and the relative decrease in the cost of information (vis a vis inventory, transportation, storage, etc.) over the last decade or so have led many organizations to reengineer their logistics process to capitalize on the new information capabilities. Furthermore, these changes in information technology have greatly altered the nature of logistics employees' work and affected staffing requirements by making individual employees more productive.

In summary, changing the logistics process usually means an organizational restructuring of the logistics area with the movement being toward structural organizational compression. That is, logistics operations are being structured so they can perform required work better while using fewer human resources. The motivation for logistical structural compression starts with the changing role of the logistics functions and its key executives. In an environment characterized by restricted head count and intense asset control, logistics is emerging as an integral part of a firm's struggle to gain and maintain customer loyalty (Bowersox and Closs 1996).

RESEARCH PROPOSITIONS

As noted earlier, the primary purpose of this article is to investigate the effect of downsizing on logistics performance and logistics employees' fulfillment. Additionally, the effect of downsizing on logistics achievement outcomes is examined. The logistics performance factors considered are speed,

reliability, special services, and cost. They represent outcome measures of the internal logistics process. The components of employee fulfillment are stress, morale, company loyalty, and economic rewards. Logistics achievement outcomes reflect measures of logistics output and include logistics quality, customer satisfaction, and the financial contribution of logistics to the firm.

Three research propositions concerning logistics performance, employee fulfillment, and overall logistics achievement are evaluated. The first proposition is that the logistics performance factors will be perceived to have improved in the past five years in firms with downsized logistics personnel. A corollary proposition involves a comparison of downsized firms with those that have not downsized. We postulate that firms with downsized logistics will perceive a greater improvement in their performance factors than both firms with no change in logistics personnel and firms with increased logistics personnel (i.e., they will report greater increases or lesser decreases).

The second proposition is that logistics employee fulfillment will be perceived to have declined in the past five years in firms with downsized logistics personnel. Additionally, we postulate that employee fulfillment in the downsize group will have declined relative to that in both firms with no change in logistics personnel and firms with increased logistics personnel.

Lastly, we expect that overall logistics achievement will be perceived to have improved in the past five years in firms with downsized logistics personnel. Furthermore, we postulate that firms with downsized logistics will perceive greater improvements in overall logistics achievement than both firms with no change in logistics personnel and firms with increased logistics personnel.

RESEARCH DESIGN

The approach utilized in this study is to analyze the results of those firms that have downsized their logistics personnel and compare these results

with the results of those firms that have not downsized. Because logistics performance and employment fulfillment data (as well as data on size of logistics workforce) are not publicly available, a survey instrument was developed to generate the necessary data. The questionnaire was distributed to logistics managers to obtain their perceptions of their firms' performance and outcomes in the areas of interest. Sample selection, measures for the logistics performance and employee fulfillment factors, and method of analysis are discussed below.

The Sample

The directory of the American Society of Transportation and Logistics (AST&L) was used to generate the sample for this study. While both carriers and shippers have undergone downsizing, the focus of this study is on shipper firms. The main reason for not including both types of organizations in the study is that they have very different operating processes and, thus, utilize different performance measures. This makes it difficult to make meaningful comparisons on performance across the two groups. Consequently, only shipper members of AST&L were selected (i.e., carrier, consultant, and educator members were not included). The logistics personnel selected for the sample had job titles reflecting middle and senior management level responsibilities. All potential respondents were employees in separate firms. The questionnaire was a mailed computer disk, which provided computer-assisted interviewing, and eliminated potential questionnaire to data coding errors.

A total of 340 questionnaires were mailed, 100 were returned, and 88 were usable for a 26% effective response rate. The most frequent indicated job titles were Traffic Managers (29%), Director of Transportation (13%), and Vice-President (12%). In terms of level of job responsibility, the categories of senior, middle, and operations management were indicated by 25, 51 and 24 percent, respectively. Ninety-one percent of the respondents were male, the modal age category was 45 to 49 (31%), and ninety percent had at least one college degree.

Measures and Analysis

Three categories of change in logistics size were created from responses concerning changes in the number of non-supervisors and the number of managers in the logistics area in the past five years. In aggregate, 42 firms were found to have reduced logistics personnel, 19 firms had no net change, and 27 firms increased logistics personnel.

Performance changes were measured in the speed, reliability, special services, and cost performance factors over the past five years. Each factor included multiple measures. The logistics speed measurements were order processing time, order fill rate, transit time, and throughput time. Transit time dependability and shipment accuracy were the measured components of logistics reliability. The special services measured were the ability to meet unique needs and the ability to expedite orders. Inventory cost per SKU, storage and handling costs per SKU, and transportation costs per SKU were the measured elements of logistics cost. Overall logistics achievement was indicated by changes in the quality of logistics work, customer satisfaction with logistics, and the financial contribution of logistics to the firm. Employee fulfillment was measured from reported changes in stress, morale, company loyalty, and salary level for non-supervisory and managerial personnel.

Each of the performance, employee fulfillment, and overall achievement indicators were measured in reference to change in the past five years, using the response set of 1 = greatly decreased, 2 = decreased, 3 = no change, 4 = increased, and 5 = greatly increased. The propositions were evaluated by descriptive and statistical analysis. One-way analysis of variance (ANOVA) was employed in the pairwise statistical comparisons of mean scores on the performance, employee fulfillment, and overall achievement indicators. Separate variance estimate t-ratios were used if the test for variance homogeneity was rejected.

Pairwise statistical comparisons of average differences were made for the downsized firms with the stable and increase firms. (Though not related to the research propositions, comparisons between firms with stable employment and firms with increased employment are also provided for completeness of reporting.) The magnitude of the mean scores was also used in the assessments of the research propositions.

RESULTS

In general, the data suggest that reduction in logistics employees is related to the adoption of TQM and re-engineering programs. As Table 1 reports, TQM programs had been implemented in almost 80 percent of the downsize firms, and almost 70 percent of the downsize group reported implementation of a re-engineering program. Only 40 percent of the stable and increase firms reported TQM implementation, and just slightly more than one in five of these firms indicated that they had re-engineering programs. The remainder of this section addresses the research propositions. In discussing the results of the comparisons among groups, a p-value of 0.10 or less (i.e., the probability that the mean scores are different is 90 percent or greater) will be used to identify those variables for which the group averages are different.

Table 2 summarizes the reported averages for the 11 measured logistics performance variables and provides paired-comparisons of the mean responses among the three groups. The proposition that downsize firms will have experienced an increase in logistics performance over the last five years is generally supported. The mean scores for all 11 variables are above the scale midpoint. The ability to provide special logistics services and logistics reliability, in particular, increased substantially. Downsize firms, on average, also report a fairly strong improvement in three of the four speed factors.

TABLE 1
Percentage of Respondents with TQM Programs and
Re-Engineering Programs by Change in Logistics Personnel Performance

Change in Personnel	TQM Program	Re-Engineering Program
Downsize	78.6	69.1
Stable	36.8	21.1
Increase	40.7	22.2

Similarly, all but two of the 22 mean scores on the performance variables for the stable and increase firms are above the scale midpoint. These results reveal the perception of respondents that most aspects of their logistics performance are better today than five years ago.

The corollary propositions that downsize firms will report a greater increase in logistics performance than stable and increase firms is generally not supported. In the comparison with stable firms the

only performance factors with statistically significant different means are the two reliability measures and one special services measure, the ability to meet unique needs. For each of these factors the downsize group reports a larger improvement over the last five years. In the comparison with increase firms the only differences occur in the cost factor. The downsize firms indicate greater improvement than increase firms on all three cost measures (and the p-values are all less than 0.05).

TABLE 2
Change in Performance Factors over the Past Five Years

Performance Factors	<u>Personnel Change¹</u>			<u>p-value²</u>		
	Downsize	Stable	Increase	Downsize versus Stable	Downsize versus Increase	Stable versus Increase
Speed:						
Order Processing	3.67	3.74	3.52	8.37	.631	.594
Order Fill Rate	3.10	3.11	3.30	.972	.433	.539
Transit Time	3.95	3.74	3.96	.350	.959	.365
Throughput Time	3.69	3.26	3.41	.148	.281	.650
Reliability:						
Transit Time Dependability	3.88	3.37	3.51	.078	.161	.630
Shipment Accuracy	3.83	3.16	3.59	.014	.320	.140
Special Services:						
Ability to Meet Unique Needs	4.14	3.58	3.93	0.38	.366	.235
Ability to Expedite Orders	4.07	3.79	3.85	.294	.360	.830
Cost Per SKU:						
Inventory	3.57	3.31	3.00	.319	.014	.256
Storage & Handling	3.38	3.26	2.89	.645	.033	.179
Transportation	3.55	3.53	2.96	.938	.019	.062

¹Mean or average values on five-point scale where 1 = greatly decreased, 3 = no change, and 5 = greatly increased.

²p-value represents the probability that means are equal.

Employee Fulfillment

The second proposition stated that logistics employee fulfillment will be perceived to have declined in firms with downsized logistics. Table 3 includes the respondents' perceptions of changes in stress, morale, loyalty, and salary level over the last five years for two employee groups: managers and non-supervisors. The data generally suggest that employment fulfillment has declined over the last five years for both employee groups in the downsize firms. Stress levels are substantially higher for both groups and loyalty to the company has decreased somewhat for both.

The mean scores for the morale variable are near the scale midpoint, indicating no apparent change. The only positive change for employees is the increased salary level.

It should be noted that only the four mean scores on the stress variable (for both managers and non-supervisors) show a decrease in employee fulfillment for the stable and increase firms. The other eight mean scores are above the scale midpoint. Conversely, five of the eight mean scores for the downsize firms are on the "unfavorable" side of the scale midpoint.

TABLE 3
Change in Employee Fulfillment Factors over the Past Five Years

Employee Fulfillment Factors	<u>Personnel Change¹</u>			Downsize versus Stable	<u>p-value²</u>	
	Downsize	Stable	Increase		Downsize versus Increase	Stable versus Increase
Managers:						
Stress	4.43	4.05	4.30	0.76	.481	.286
Morale	3.07	3.26	3.48	.500	.108	.479
Loyalty	2.79	3.11	3.33	.209	.017	.407
Salary	3.52	3.79	3.89	.113	.022	.552
Non-Supervisors:						
Stress	4.05	3.58	3.81	.041	.251	.337
Morale	2.88	3.26	3.44	.199	.035	.572
Loyalty	2.79	3.37	3.07	.012	.158	.235
Salary	3.57	3.89	3.74	.037	.313	.354

¹Mean or average values on five-point scale where 1 = greatly decreased, 3 = no change, and 5 = greatly increased.

²p-value represents the probability that means are equal.

TABLE 4
Change in Logistics Achievement Factors over the Past Five Years

Logistics Achievement Factors	<u>Personnel Change</u> ¹			<u>p-value</u> ²		
	Downsize	Stable	Increase	Downsize versus Stable	Downsize versus Increase	Stable versus Increase
Logistics Quality	3.93	3.89	4.15	.883	.284	.286
Customer Satisfaction	3.90	3.58	3.96	.182	.788	.147
Financial Contribution	4.21	3.84	4.33	.088	.537	.038

¹Mean or average values on five-point scale where 1 = greatly decreased, 3 = no change, and 5 = greatly increased.

²p-value represents the probability that means are equal.

The corollary proposition that employee fulfillment in the downsize group will have declined relative to that in the two comparison groups is generally supported. The comparison of the downsize and stable groups indicates that the fulfillment of non-supervisory employees in downsize firms is perceived to have worsened significantly for three of the four factors. That is, stress increased more in the downsize group; loyalty decreased for downsize non-supervisory employees but increased for their counterparts in the stable group; and salaries increased more for the stable group. Interestingly, there are far fewer perceived differences in fulfillment for managers between the two groups. The only statistically significant difference is in the change in stress, with managers in the downsize group reporting a larger increase.

The comparison of the downsize and increase groups also supports the second proposition, but, unlike the previous comparison, most of the significant differences are for the managers rather than the non-supervisory employees.

Managers in the increase group perceive a greater increase in morale and salary level, and they perceive an increase in loyalty versus the decrease reported by the downsize respondents. The only statistically significant difference for non-

supervisory employees is on the morale variable—the downsize group indicates a slight decrease and the increase group perceives an increase.

Overall Achievement

The third proposition stated that overall logistics achievement will be perceived to have improved in firms with downsized logistics. The mean scores for the customer satisfaction, logistics quality, and financial contribution to the firm variables are given in Table 4. The magnitude of the scores provide support for the proposition of improved overall logistics achievement by downsize firms. Indeed, overall logistics achievement improved substantially on all measures for each of the three comparison groups.

The only significant difference between downsize firms and either of the other two comparison groups was the difference with stable-size firms on the financial contribution measure. The downsize firms perceive a greater improvement in the financial contribution of logistics to the firm than do the stable firms. Thus, the proposition that firms with downsized logistics will have higher overall logistics achievement than firms with no change in logistics personnel is generally not supported.

CONCLUSIONS AND IMPLICATIONS

This study utilized the perceptions of surveyed logistics managers about changes in logistics performance and employee fulfillment to test for statistically significant differences in outcomes between firms that had downsized their logistics workforce over the last five years and firms that had not downsized. Before drawing conclusions and implications from the study, a few caveats and limitations of the study should be noted.

Limitations of the Study

As is true with nearly all research on logistics performance, this study relies on self-reported, perceptual changes in performance over time and not on actual performance data. Logistics data are generally not provided in separate accounts in the financial and operating documents released by publicly held firms. A survey instrument that solicits actual performance data for a five year period would be very lengthy and time-consuming for potential respondents (i.e., likely to produce a low response rate).

In a similar vein, this study relies on the perceptions of managers about the stress, morale, and loyalty levels of their colleagues and subordinates. The ideal approach of surveying the employees in each respondent firm is not practical from a time or resource perspective. Thus, most research relies on the judgment and knowledge of representatives of the firm though there is potential for bias in their responses. Furthermore, due to the size of the sample, the respondents were not disaggregated on the basis of title or managerial position. That is, each respondent regardless of her or his position within the logistics management structure is assumed to perceive accurately the logistics performance and employee attitudes of her or his firm.

A final caveat pertains to the firms targeted by the study. The sample firms are not necessarily representative of all shippers. Indeed, it is often argued that firms belonging to leading professional organizations tend to be more progressive or advanced. Regardless, the experiences and

perceptions of these firms provide useful insights for those working in the logistics field.

Conclusions and Implications

The two major conclusions of this research are:

(1) Respondent firms that have downsized their logistics workforce perceive that they have substantially improved their logistics performance, but no more so than respondent firms that have not downsized; and

(2) Stress, morale, and loyalty have worsened for logistics employees over the last five years in respondent firms that have downsized, both in an absolute sense and relative to employees in respondent firms that have not downsized.

It appears, thus, that respondent firms have not been able to avoid the adverse effects of downsizing, and their performance improvements, particularly in the key outcome areas of quality, customer satisfaction, and financial contribution, have not exceeded those of non-downsizing respondent firms. Surprisingly, given that cost savings are often cited as a major reason for downsizing, stable-size respondents perceived similar cost improvements over the past five years as did downsize respondents. It should be noted, however, that downsize respondents do perceive better cost performance changes than do increase-size respondents while there are no differences in their perceptions of changes in any of the eight other performance factors or the three overall achievement factors.

The decrease in logistics employee morale and loyalty poses a daunting but important challenge for the downsize firms. The increasing role of logistics in customer service has already been noted. Employee involvement is critical to the successful creation of customer satisfaction. Indeed, TQM stresses internal customers, i.e., employees, as much as external customers. Many TQM practices are intended to enhance the feeling of employee "ownership" of the process and outcomes, particularly with respect to outcomes affecting the external customers. Two recent

empirical studies of how logistics creates customer satisfaction provide further evidence of the vital role of employees.

A comprehensive study of the logistics improvement process was conducted by the consulting firm A.T. Kearney in 1991. Based on a survey of more than 400 U.S. companies and 57 interviews with leading companies in quality and productivity improvement, the study identified four major characteristics shared by successful firms in the creation of customer value. One of these was employee ownership of improvement. Suggested practices to facilitate employee ownership included training, team approaches, reward and recognition (Byrne and Markham 1991).

A more recent project involved a survey of nearly 3700 firms from 11 countries in North America, Europe, and the Pacific Basin and interviews with 111 firms to identify world class logistical practices. The researchers proposed a Logistics

Competency Model comprised of four competencies: Positioning, Integration, Agility, and Measurement. Positioning encompassed several employee components including empowerment, learning, and teaming (The Global Logistics Research Team at Michigan State University 1995).

The failure to involve employees in the decision making process, to share the pain between top management and the employees, and to carry out downsizing activities in the context of a careful and far-reaching strategic review are part of the reason why downsizing so often fails to yield the returns expected from it (Evans, Gunz and Jalland 1996). Though their logistics performance appears not to have suffered to date, the downsize respondent firms can ill afford to ignore the adverse effects downsizing has had on their employees. It is very difficult for any firm with unhappy and unsatisfied logistics employees to maintain or improve its customer service over the long term.

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