The impact of logistics performance on organizational performance in a supply chain context

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Abstract

Purpose – The paper’s aim is to theorize and assess a logistics performance model incorporating logistics performance as the focal construct with supply chain management strategy as antecedent and organizational performance, both marketing and financial, as consequences.

Design/methodology/approach – Data from a national sample of 142 plant and operations managers are analyzed using a structural equation modeling methodology.

Findings – The results indicate that logistics performance is positively impacted by supply chain management strategy and that both logistics performance and supply chain management strategy positively impact marketing performance, which in turn positively impacts financial performance. Neither supply chain management strategy nor logistics performance was found to directly impact financial performance.

Research limitations/implications – To compete at the supply chain level, manufacturers must adopt a supply chain management strategy. Such a strategy requires integration and coordination of key external processes such as purchasing, selling, and logistics with supply chain partners. In this study the focus is limited to the impact of logistics performance on organizational performance within a supply chain context.

Practical implications – As manufacturers work to improve the logistics processes, they support their organization’s supply chain strategy, resulting in improved performance for the overall supply chain and ultimately their manufacturing organizations.

Originality/value – Organizational managers are being asked to focus directly on supply chain functions such as logistics to bolster the competitiveness of the supply chains in which their organizations are integral partners. Does such a supply chain focus ultimately result in improved organizational performance? This study provides evidence that a supply chain focus will enhance logistics performance, which will ultimately result in improved organizational performance.

Keywords Supply chain management, Organizational performance, Mathematical modelling

Paper type Research paper

Introduction

According to de Kluyver and Pearce (2006, p. 4), the ultimate goal of strategy is “long-term, sustainable superior performance.” Such superior performance now depends on the ability of a manufacturing organization to become a fully integrated partner within a supply chain context (Cooper et al., 1997), thus all but requiring that manufacturing organizations adopt a supply chain strategy. Such supply chain strategies focus on how both internal and external business processes can be integrated and coordinated throughout the supply chain to better serve ultimate customers and consumers while enhancing the performance of the individual supply chain members (Cohen and Roussel, 2005). Examples of business processes that must be integrated include manufacturing, purchasing, selling, logistics, and the delivery of real-time, seamless information to all supply chain partners. Managing at the supply chain level requires a new focus and new ways of managing (Lambert et al., 1998). Manufacturing managers must learn to communicate, coordinate, and cooperate with supply chain partners (Gammelgaard and Larson, 2001).

For this study, we adopt the Larson and Halldorsson (2004) “unionist” perspective on the relationship between supply chain management and logistics. This perspective holds that supply chain management incorporates logistics as...
a key supply chain focused function (Council of Supply Chain Management Professionals, 2007). Organizational managers are asked to focus attention and resources directly on supply chain functions such as logistics to bolster the competitiveness of the supply chains. The managers are, however, ultimately judged on the marketing and financial performance of their organizations.

Does a supply chain focus lead to improved logistics performance, which, in turn, results in improved organizational performance? It is our purpose to answer that question. Building on the works of Schramm-Klein and Morschett (2006), Wisner (2003), and Bowersox et al. (2000), we theorize a logistics performance model with logistics performance as the focal construct and supply chain management strategy as antecedent and marketing performance (sales and market share growth) and financial performance (return on investment and profit growth) as consequences. Data collected from a national sample of US manufacturers are used to assess the model following a structural equation methodology.

A review of the related literature and discussion of the theorized model with incorporated hypotheses follow in the next section. The methodology employed in the study is then presented. The results of the scale assessment and the structural equation modeling results follow. The conclusions section, which incorporates discussions of the contributions of the study, limitations of the study, suggestions for future related research, and implications for practicing managers is in the final section.

**Literature review**

Mentzer et al. (2001, p. 4) define a supply chain as “a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from source to customer.” Stank et al. (2005, p. 27) describe supply chain management as a “strategic level concept.” Ho et al. (2002) conceptualize SCM as having three core elements:

1. value creation;
2. integration of key business processes; and
3. collaboration.

Based on this conceptualization, they define supply chain management as follows:

> SCM is the philosophy of management that involves the management and integration of a set of selected key business processes from end user through original suppliers, that provides products, services, and information that add value for customers and other stakeholders through the collaborative efforts of supply chain members (Ho et al., 2002, p. 4422).

Logistics is an important component of supply chain management (Stank et al., 2005). The Council of Supply Chain Management Professionals (2007) defines logistics management as “that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers’ requirements.” Both Stank et al. (2002) and Lin (2006) describe the importance of integrating the logistics processes of all supply chain partners to better serve the needs of ultimate customers. Rodrigues et al. (2005, p. 1) identify logistics as “one of the largest costs involved in international trade.”

Rabinovich and Knemeyer (2006) identify a new breed of logistics-related firms: logistics service providers that support internet supply chains. These logistics service providers help internet sellers integrate with the myriad of available logistics firms to fulfill customer orders more effectively and efficiently (Rabinovich and Knemeyer, 2006). Logistics service providers establish relationships with both internet sellers and third-party logistics providers and integrate the selling and flow processes throughout the supply chain through the provision of what Rabinovich and Knemeyer (2006, p. 90) call “hub functionalities.” Vaidyanathan (2005) describes a similar role for fourth-party logistics providers in more traditional supply chain configurations such as those that link manufacturers with ultimate customers. Lai and Cheng (2003) discuss the importance of a supply chain focus on the part of transport logistics service providers as they function to link suppliers, manufacturers, sellers, and customers throughout the supply chain. They argue that transport logistics service providers must focus on supply chain performance in addition to organizational performance.

Morash and Clinton (1998) investigated the creation of customer value through the supply chain integration of collaborative closeness and operational excellence. They illustrated models identifying logistics as the unifying link intra-organizationally between the production and marketing functions and inter-organizationally between suppliers and customers. Analyzing data from almost 2,000 firms in the USA, Australia, Japan, and Korea, they found that efficient supply chains exhibit operational excellence and responsive supply chains exhibit collaborative closeness. Japanese and Korean firms were more likely to integrate supply chains based on operational excellence, while US and Australian firms were more likely to integrate supply chains on the basis of collaborative closeness.

Srivastava (2006) investigated the state of logistics and supply chain practices in India. He found that, while Indian managers are well aware of the need to develop supplier partnerships, integrate and coordinate the flow of goods from supplier’s supplier to ultimate customer, and share information among supply chain partners, the infrastructure necessary to facilitate such seamless integration is as yet unavailable. There is pressure in emerging markets to rapidly adopt logistics and supply chain integration practices in an effort to compete globally.

Chen and Paulraj (2004) proposed a research framework for supply chain management based upon the “collaborative advantage” paradigm. The framework incorporates environmental uncertainty, strategic purchasing, information technology, supply network structure, and logistics integration as impacting buyer-seller relationships and subsequently resulting in improved buyer and seller performance.

Managers have traditionally focused on improving the performance of the organizational entity for which they are directly responsible. Supply chain management requires an external focus in which managers must consider the impact of organizational strategies on supply chain partners. Attempts to optimize organizational performance may negatively impact overall supply chain performance, thus damaging the competitive advantage of the chain (Chopra and Meindl, 2004; Meredith and Shafer, 2002).

According to Chopra and Meindl (2004), supply chain performance is optimized only when an “inter-organizational,
inter-functional” strategic approach is adopted by all chain partners. Such an approach maximizes the supply chain surplus available for sharing by all supply chain members. Meredith and Shafer (2002, p. 261) argue that “if each segment of the supply chain is acting in a way to optimize its own value, there will be discontinuities at the interfaces and unnecessary costs will result. If an integrated view is taken instead, there may be opportunities in the supply chain where additional expense or time in one segment can save tremendous expense or time in another segment.”

Organizational strategies that support supply chain strategies should strengthen the competitive position of the supply chain which, in turn, enhances performance of each of the individual supply chain partners. While the link from supply chain performance is theoretically justified, no empirical evidence related to the link was identified.

Logistics performance model

A decade ago, Morash and Clinton (1997) proposed a schema for future supply chain research that included transportation and logistics capabilities as the link between supply chain structure and performance. While Wisner (2003) hypothesized a positive link between logistics strategy and organizational performance, he did not report data collection related to logistics strategy measurement and did not report results related to his hypotheses. Schramm-Klein and Morschett (2006) assessed the relationship between logistics quality and the organizational performance of firms in the retail sector. It is our purpose to build on the work of Schramm-Klein and Morschett (2006), Wisner (2003), and Morash and Clinton (1997) by empirically investigating the link between logistics performance and organizational performance in the manufacturing sector. We utilize Wisner's measure of supply chain management strategy, a measure of logistics performance from Bowersox et al. (2000), and measures of the marketing performance and financial performance of the organization from Green and Inman (2005) to collect data from a national sample of plant and operations managers to support a structural analysis of a theorized logistics performance model. We propose a logistics performance model that incorporates logistics performance as the focal construct with supply chain management strategy as antecedent and organizational performance, both financial and marketing, as consequences. Although the model as proposed is original, it does build upon and extend the works of Green et al. (2006) and Wisner (2003). The model incorporates six hypotheses and is illustrated in Figure 1.

Construct definitions

The model incorporates the following constructs:

- supply chain management strategy;
- logistics performance;
- marketing performance; and
- financial performance.

A supply chain management strategy requires an end-to-end supply chain focus that supports integration of business processes such as purchasing, manufacturing, selling, and logistics throughout the chain for the purpose of providing optimum value to the ultimate customer/consumer (Cohen and Roussel, 2005; Wisner, 2003). Implementation of such a strategy requires that actions be taken to strengthen relationships and develop trust among supply chain partners to facilitate the integration of processes throughout the supply chain from suppliers’ supplier to ultimate consumer/consumer (Cohen and Roussel, 2005; Wisner, 2003). The logistics performance construct reflects the organization’s performance as it relates to its ability to deliver goods and services in the precise quantities and at the precise times required by customers. Bowersox et al. (2000) incorporate performance metrics such as customer satisfaction, delivery speed, delivery dependability, and delivery flexibility. Marketing performance reflects the organization’s ability to increase sales and expand market share as compared to its competition (Green and Inman, 2005; Green et al., 2006). Financial performance reflects an organization’s profitability and return on investment as compared to its competition (Claycomb et al., 1999; Green et al., 2004; Green and Inman, 2005).

Hypotheses

Vukurka and Lummus (2000) specify the goal of supply chain management as adding value for customers at reduced overall costs. The added value should be reflected in the cost, quality, flexibility, and delivery components of supply chain performance (Ho et al., 2002). Oliver and Delbridge (2002) and Bowersox et al. (2000) provide empirical evidence related to the impact of a supply chain management strategy on supply chain performance. Oliver and Delbridge (2002) compared six “high performing” supply chains with six “low performing” chains on the basis of four supply chain performance measures. High performing chains exhibited fewer incoming defects, fewer outgoing defects, a lower percentage of late deliveries to second-tier suppliers and a lower percentage of late deliveries from first-tier suppliers. Bowersox et al. (2000) gathered data from 306 senior North American logistics executives and categorized the companies represented as either “high achievers” or “average achievers” in terms of supply chain competencies. The high and average achievers were then compared on the basis of logistics performance metrics related to customer service, quality, productivity, and asset management. The high achievers exhibited significantly higher scores for each performance metric measured. Based on this theoretical justification and the supporting empirical evidence from Bowersox et al. (2000), hypothesis 1 is stated as follows:

\[ H1. \] A supply chain management strategy is positively associated with logistics performance.

Wisner (2003) hypothesized supply chain management strategy as a positive predictor of firm performance. Justification for the hypothesis was based on the argument that performance evaluation of the purchasing and supply management functions will become closely linked to measures of organizational performance such as growth, profitability, and market share (Carter and Narasimhan, 1996). Wisner (2003) surveyed US and European manufacturing and service organizations and structurally assessed a model that incorporated supplier management and customer relationship strategies as antecedents to supply chain management strategy and firm performance as a consequence. The link from supply chain management strategy to firm performance was found to be positive and significant as hypothesized. Additional empirical evidence is provided by Armistead and Mapes (1993), who collected data from 38 UK manufacturing organizations. They measured supply chain integration and perceptions of
manufacturing performance and found them to be highly and positively correlated. After surveying senior supply and materials management professionals in the USA, Tan (2002) concluded that supply chain management practices positively impact firm performance. Vickery et al. (1999) surveyed CEOs of firms in the office and residential furniture industry to assess the relationships among supply chain flexibility measures of product, volume, launch, access and target market flexibility, and measures of overall firm performance. They found volume flexibility to be positively correlated with all measures of performance. Launch and target market flexibility were correlated with four of the six measures of performance. Product flexibility was related only to return on investment, and access flexibility only to market share. Tan et al. (2002) collected data from 101 senior managers of US manufacturing firms to assess the relationship between supply chain management factors and firm performance measures. They found that the supply chain characteristics factor was negatively correlated with average selling price and positively correlated with overall product quality and overall customer service levels. Green et al. (2006) surveyed sales managers for manufacturing firms and found positive links between supply chain management strategy and both marketing and financial performance. Based on the theoretical justification and supporting empirical evidence, the second and third hypotheses are:

**H2.** A supply chain management strategy is positively associated with marketing performance.

**H3.** A supply chain management strategy is positively associated with financial performance.

Organizational strategies that support supply chain strategies should strengthen the supply chain’s overall ability to deliver value to the ultimate customer. Shao and Ji (2006, p. 64) assert that “logistics is the key to making and keeping customers.” Novack et al. (1992) and Schramm-Klein and Morschett (2006) argue that logistics performance is a necessary prerequisite to marketing performance. The logistics function creates place, time, quantity, and space value, which are essential to customer satisfaction (Novack et al., 1992; Sheen and Tai, 2006). Wisner (2003) theorized a positive association between logistics performance and organizational performance. Schramm-Klein and Morschett (2006) hypothesized positive associations between logistics quality and marketing and financial performance and found support for the hypotheses in a sample of 262 retailers. Based upon the theoretical justification and empirical results, hypotheses 4 and 5 are stated as follows:

**H4.** Logistics performance is positively associated with marketing performance.

**H5.** Logistics performance is positively associated with financial performance.

While organizational managers must focus attention and resources on supply chain functions such as logistics, their primary concern remains improved organizational performance. Specifically, managers work to improve marketing performance in terms of sales and market share growth. The growth of market share and sales growth should impact financial performance through improved revenue numbers. Anderson et al. (1994) found that marketing performance, as measured by customer satisfaction, positively impacts financial performance, as measured by return on investment. Green et al. (2006) surveyed sales managers for manufacturing firms and found a positive link between marketing performance and financial performance. In their study of retailers, Schramm-Klein and Morschett (2006, p. 283) hypothesized that “marketing performance has a positive effect on company performance” and found that sales performance positively influenced financial performance. Based on this theoretical justification and empirical evidence, hypothesis 6 is stated as follows:

**H6.** Marketing performance is positively associated with financial performance.
Methodology

Plant and operations managers representing 1,461 different firms were selected from the Manufacturers, News, Inc. database of US manufacturers with 500 or more employees. These manufacturing managers were surveyed using a traditional initial and follow-up mailing procedure during the spring of 2005.

The sample frame was constructed primarily to target relatively high-level managers such as plant and operations managers. Such high-level managers were targeted in the belief that, while they are intimately aware of the internal operational workings of their organizations, they are also well aware of their organization’s supply chain strategy and the performance of such supply chain functions as logistics. As the focus of operations related research shifts from the firm to the supply chain level, it becomes more difficult for researchers to identify groups within organizations that are both aware of both internal and external processes and performance. As more supply chain professionals are employed by firms, a new more appropriate sample frame for supply chain research may develop.

In total, 142 responded with completed instruments for a response rate of 9.7 percent. The response rate is not atypical of that obtained in industrial research (Harmon et al., 2002). Other reported response rates under similar circumstances are:

- 7.5 percent (Nahm et al., 2004);
- 10.8 percent (Harmon et al., 2002); and
- 6.7 percent (Tan et al., 2002).

Larson (2005) found that response rates for mail survey-based studies in the Journal of Business Logistics declined precipitously during the period from 1989 to 2003. While manufacturing managers are the prime source for supply chain management related data, they are often under severe time and resource constraints.

In addition to the survey response rate, item completion rate can be used as another measure of survey effectiveness (Klassen and Jacobs, 2001). Klassen and Jacobs (2001, p. 717) define item completion rate as “the proportion of survey items answered relative to all applicable items.” The item completion rate for this study is a relatively high 96.7 percent.

In their discussion of sample size necessary to support structural equation modeling, Hair et al. (2006, p. 742) state, “SEM models containing five or fewer constructs, each with more than three items (observed variables), and with high item communalities (0.6 or higher), can be adequately estimated with samples as small as 100-150.” The measurement model illustrated in Figure 2 incorporates four constructs, each with three or more observed items, all of which exhibit communalities greater than 0.60. The sample size of 142 is, therefore, considered adequate to support the structural equation analysis necessary to assess the logistics performance model (Hair et al., 2006).

All of the respondents indicated that they worked for manufacturing organizations. In total, 62 percent of the respondents identified themselves specifically as plant or operations managers. An additional 15 percent held purchasing and inventory management positions. A total of 19 specific manufacturing SIC codes were identified and respondents represented 33 different states.

Results

Non-response bias was assessed using a common approach described by Lambert and Harrington (1990) in which the responses of early and late respondents are compared. Of the study respondents, 54 percent (77) were categorized as early respondents and 46 percent (65) were categorized as late respondents based on whether they responded to the initial or follow-up request to participate. A comparison of the means of the descriptive variables and the scale items for the two groups was conducted using one-way ANOVA. The comparisons resulted in statistically non-significant differences. Because non-respondents have been found to descriptively resemble late respondents (Armstrong and Overton, 1977), this finding of general equality between early and late respondents supports the conclusion that non-response bias is not a major concern.

When data for the independent and dependent variables are collected from single informants, common method bias may lead to inflated estimates of the relationships between the variables (Podsakoff and Organ, 1986). Harman’s one-factor test was used post hoc to examine the extent of the potential bias. Substantial common method variance is signaled by the emergence of either a single factor or one “general” factor that explains a majority of the total variance (Podsakoff and Organ, 1986). Results of the factor analysis revealed seven factors, which combined to account for 71 percent of the total variance. While the first factor accounted for 31 percent of the total variance, it did not account for a majority of the variance. Based upon these results, problems associated with common method bias are not considered significant.
scales was assessed using confirmatory factor analysis, as recommended by Gerbing and Anderson (1988). It was necessary to re-specify the supply chain management strategy and logistics performance scales to achieve sufficient unidimensionality. The supply chain management strategy scale was reduced to six items and the logistics performance scale to five items. Generally, items with standardized coefficients less than 0.70 and items that contributed to standardized residuals with values greater than 3.00 or less than −3.00 were deleted (Raykov and Marcoulides, 2000). The supply chain management strategy and logistics performance scales, as re-specified, and the financial performance scale yielded goodness-of-fit index (GFI) values greater than 0.90 (Ahire et al., 1996), non-normed-fit index (NNFI) and comparative-fit index values greater than 0.90 (Garver and Mentzer, 1999), and root mean square error of approximation (RMSEA) values between 0.05 and 0.08 (Garver and Mentzer, 1999), indicating sufficient unidimensionality. Because the marketing performance scale includes only three items, it could not be subjected to a full confirmatory factor analysis. It did, however, exceed the requirements that all parameter estimates be of the proper sign, significant, and greater than 0.70 as recommended by Garver and Mentzer (1999). The scale items used in the analysis to follow are identified in Table I.

Alpha and construct-reliability values greater than or equal to 0.70 and a variance-extracted measure of 0.50 or greater indicate sufficient scale or factor reliability (Garver and Mentzer, 1999). The alpha, construct-reliability, and variance-extracted values for each of the scales exceeded the recommended values indicating sufficient reliability.

Convergent validity for the supply chain management strategy, logistics performance, and financial performance was assessed using the normed-fit index coefficient as

![Figure 2](image-url)
recommended by Ahire et al. (1996), with values greater than 0.9 indicating strong validity. The NFI for each of the scales exceeds the 0.90 level, indicating sufficient convergent validity. When the NFI is unavailable, as for the marketing performance scale, Garver and Mentzer (1999) recommend reviewing the magnitude of the parameter estimates for the individual measurement items to assess convergent validity with statistical significance of an estimate indicating a weak condition of validity and an estimate greater than 0.7 indicating a strong condition. The parameter estimates for the marketing performance items exceeded the criteria. All scales exhibit convergent validity.

Discriminant validity was assessed using a $\chi^2$ difference test for each pair of scales under consideration, with a statistically significant difference in $\chi^2$ indicating validity (Garver and Mentzer, 1999; Ahire et al., 1996; Gerbing and Anderson, 1988). All possible pairs of the study scales were subjected to $\chi^2$ difference tests with each pairing producing a statistically significant difference, indicating sufficient discriminant validity. Predictive validity was assessed by determining whether the scales of interest correlate as expected with other measures (Ahire et al., 1996; Garver and Mentzer, 1999). A review of the correlation matrix (Table II) for the study values supports claims of predictive validity for each study variable. The study variables are positively correlated with the coefficients significant at the 0.01 level.

A structural assessment of the full measurement model indicates that the measurement model fits the data moderately well with a relative chi-square ($\chi^2$/degrees of freedom) of 2.02, a RMSEA of 0.08, a GFI of 0.83, an NFI of 0.91, and a CFI of 0.94. The full measurement model is displayed in Figure 2. The individual measurement scales are considered sufficiently unidimensional, reliable and valid and the fit of the

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<td>Logistics performance (LP)</td>
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<td>Financial performance (FP)</td>
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<td>Marketing performance (MP)</td>
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<td>B. Correlation matrix (n = 142)</td>
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<td>FP</td>
<td>0.193<em>0.243</em>1.000</td>
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<td>MP</td>
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<td>Note: **Correlation is significant at the 0.01 level (two-tailed)</td>
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Table I Measurement scales

Supply chain management strategy
Please indicate the importance of each of the following issues/concerns to your organization’s supply chain management efforts (1 = low importance, 7 = high importance)

SCMS3 Searching for new ways to integrate SCM activities
SCMS4 Creating a greater level of trust throughout the supply chain
SCMS6 Establishing more frequent contact with supply chain members
SCMS9 Communicating customers’ future strategic needs throughout the supply chain
SCMS10 Extending supply chains beyond your firm’s customers/suppliers
SCMS11 Communicating your firm’s future strategic needs to suppliers

Logistics performance
Please rate your company’s performance in each of the following areas as compared to the performance of your competitors (1 = much worse than competition, 7 = much better than competition)

LOGPERF3 Delivery speed
LOGPERF5 Delivery dependability
LOGPERF6 Responsiveness
LOGPERF8 Delivery flexibility
LOGPERF10 Order fill capacity

Financial performance
Please rate your organization’s performance in each of the following areas as compared to the industry average (1 = well below industry average, 7 = well above industry average)

FINPERF1 Average return on investment over the past three years
FINPERF2 Average profit over the past three years
FINPERF3 Profit growth over the past three years
FINPERF4 Average return on sales over the past three years

Marketing performance
Please rate your organization’s performance in each of the following areas as compared to the industry average (1 = well below industry average, 7 = well above industry average)

MRKPERF1 Average market share growth over the past three years
MRKPERF2 Average sales volume growth over the past three years
MRKPERF3 Average sales (in dollars) growth over the past three years

Table II Descriptive statistics and correlations
measurement model is considered sufficient to support further assessment of the structural model.

Structural equation modeling results
Summary values for the study variables were computed by averaging across the items in the scales. Descriptive statistics and the correlation matrix for the summary variables are presented in Table II. All correlation coefficients are positive and significant at the 0.01 level.

Figure 3 illustrates the model with the structural equation modeling results specified in the LISREL 8.8 output. The relative $\chi^2$ ($\chi^2$/degrees of freedom) value of 2.02 is less than the 3.00 maximum recommended by Kline (1998). The root mean square error of approximation (0.08) equals the recommended maximum of 0.08 (Schumacker and Lomax, 2004). While NNFI (0.93) is above the recommended 0.90 level (Byrne, 1998), the GFI (0.83) is not. These indices, however, are more heavily impacted by a relatively small sample size, and, as Byrne (1998) points out, the comparative fit index (CFI) and incremental fit index (IFI) are more appropriate when the sample size is small. The CFI (0.94) and IFI (0.94) both exceed the recommended 0.90 level (Byrne, 1998).

Four of the study hypotheses are supported by the standardized estimates and associated $t$-values. The relationship between SCMS and logistics performance ($H1$) is significant at the 0.05 level with an estimate of 0.23 and $t$-value of 2.52. The estimate of 0.21 for the relationship between supply chain management strategy and marketing performance ($H2$) is significant at the 0.05 level with a $t$-value of 2.34. The relationship between supply chain management strategy and financial performance ($H3$) is not significant with an estimate of 0.00 and $t$-value of .04. The relationship between logistics performance and marketing performance ($H4$) is significant at the 0.05 level with a standardized estimate of 0.18 and an associated $t$-value of 2.02. The relationship between logistics performance and financial performance ($H5$) is not significant with a standardized estimate of 0.09 and $t$-value of 1.35. The relationship between marketing performance and financial performance is significant at the 0.01 level with a standardized estimate of 0.69 and a $t$-value of 7.67.

Generally, the results support the proposition that the adoption of a supply chain management strategy leads to improved supply chain performance, as measured by logistics performance, which in turn leads to improved organizational performance. It is very difficult to measure overall supply chain performance directly. The logistics function, however, is an externally focused supply chain function that has global, as well as local, implications for managers in the manufacturing sector.

While the performance of manufacturing managers continues to be evaluated based on organization-level metrics related to the sales, market share, and profitability of the organization, the results of this study support the contention that manufacturing managers make decisions that directly support supply chain performance which will, in turn, enhance organizational performance. This expectation that local managers first be concerned with and make decisions that strengthen the supply chain is relatively new and may be difficult for local managers to embrace. In this supply chain era, however, success of the organization depends upon the success of the supply chain or chains in which the organization operates as a partner. These results support the propositions that organizations now compete globally at the supply chain level, that organizational performance depends directly on supply chain performance, and that local manufacturing managers focus on and make decisions that enhance supply chain performance. In short, local optimization now depends on global optimization. This is a relatively new mindset but, as the results indicate, an important one for manufacturing managers.

Conclusions
The theorized logistics performance model fits the data moderately well providing support for four of the six study hypotheses. As the focal construct, logistics performance is positively impacted by supply chain management strategy and directly impacts marketing performance which, in turn, impacts financial performance. These results support the positive relationship between logistics performance and organizational performance within the manufacturing sector.

Figure 3: Theorized logistics performance structural model with standardized coefficients. $t$-Values are shown in parentheses (relative $\chi^2 = 2.02$, GFI = 0.83, CFI = 0.94, RMSEA = 0.08)
The success of the individual supply chain partners may now depend upon the overall success of the supply chain(s) in which the partners participate. Manufacturing managers should now consider the implications for the overall supply chain when making decisions related to their organization’s manufacturing, purchasing, selling, and logistics processes. Those processes are integrated and coordinated throughout the supply chain to better serve the ultimate customers. It has become critically important to measure the performance at the supply chain level as well as organizational performance. The theoretical proposition is that success at the supply chain level will result in success at the organizational level. The problem for both practitioners and researchers is that supply chain performance is relatively difficult to measure. This study incorporates an established measure of logistics performance as a surrogate for supply chain performance. Logistics is clearly a supply chain function in that it links manufacturers and customers although those customers may not be the ultimate customers in the supply chain.

The results of this study support the broad contention that manufacturers should focus on strengthening the supply chain(s) in which they operate. Successful adoption of a supply chain management strategy requires a supply chain focus and efforts by managers to strengthen linkages with both suppliers and customers. These stronger relationships result in improved performance of supply chain related functions such as logistics, purchasing and selling. In this particular case, a supply chain focus resulted in improved logistics performance, which in turn led to improved organizational performance. While organizational managers will likely still be evaluated on organization-level performance metrics, the route to enhancing organizational performance may well be through supply chain performance in the future.

In short, global optimization trumps local optimization.

While the objectives of the study were successfully accomplished, limitations of the study should be noted. A survey methodology was used that resulted in a relatively low response rate, raising concerns of potential non-response bias. Although the two waves of responses were compared and no evidence of bias was noted, a more direct assessment of the potential bias utilizing data from a third wave and an intensive follow-up on non-respondents would have strengthened the study. Because responses related to both the dependent and independent variables were collected from the same individual, the potential for common method bias was a concern. While subsequent testing for the bias relieved the concern, collection of the strategy and performance data from separate sources would also have strengthened the study.

The study results have important implications from manufacturing managers. The sustained, long-term success of a manufacturing organization now depends upon developing competitive advantage as a member of one or more supply chains. While manufacturing managers have embraced supply chain management as a strategic initiative, they continue to search for appropriate tactical approaches to implement the strategy. The logistics processes linking manufacturer and customers play an important role in supporting a supply chain management strategy. As manufacturers work to improve the logistics processes, they support their organization’s supply chain strategy resulting in improved performance for the overall supply chain and ultimately their manufacturing organizations.

References


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