EXPLORING CUSTOMER VALUE IN THE HARDWOOD LUMBER INDUSTRY

Timothy M. Smith

Assistant Professor, Marketing
Department of Wood and Paper Science
University of Minnesota
St. Paul, MN 55108

ABSTRACT

In this paper, the author investigates the role of product, service, and price-relative to competition-in determining customer value perceptions among buyers of northern hardwood lumber. Based on survey data collected in December 1999, this study examines the importance of attributes affecting purchase decisions and compares these findings with a regression approach incorporating an explicit customer value measurement. These data indicate that attributes deemed important to the purchaser are not necessarily the same attributes related to perceptions of highly valued suppliers. Results indicate that consistent availability of desired species and aesthetic qualities of shipments are the most influential attributes in the identification of suppliers providing high levels of customer value. Finally, value perceptions are examined across broad industrial buyer segments.

Keywords: Customer value, hardwood lumber, marketing research, logistic regression.

INTRODUCTION

The term "customer value" has emerged as one of the most frequently used terms in marketing circles, while simultaneously it has been interpreted in a multitude of ways. Throughout the literature, two bipolar definitions have emerged, requiring additional clarification before proceeding. The primary reason for this confusion most probably stems from the fact that customer value has been used to describe value both *from* and *to* the customer. In the former, it has represented a measure of worth attributed to a customer, or segment of customers, that is realized by a company (Slywotzky 1996). In the latter, value has been used to convey some perception of a quality-price relationship a company delivers to its customers (Band 1991; Day 1999; Gale 1994; Naumann 1995). For the purposes of this paper, the discussion focuses on the latter definition by examining the value delivered by hardwood lumber suppliers, as perceived by their customers.

For the past two decades, the forest products industry has sought profitability *primarily* through internally focused programs, such as quality management, continuous operations process improvement, reengineering, and restructuring initiatives. However, because of the emergence of more demanding customers, global competition, and much improved access and speed of communications, researchers have postulated that the next major source of competitive advantage will likely come from superior customer value delivery (Woodruff 1997). Customer-oriented management philosophies, as well as conceptual frameworks linking this philosophy with competitive advantage, have existed for some time (Day 1994). However, operational gaps have substantially slowed the process from theory to practice. Although there may be many causes for this gap, Woodruff (1997) points to a lack of operational tools available to managers that enable them to compete on superior customer value delivery.

The ability to compete based on customer value is dependent on a supplier's ability to address two focal questions, "What are the dimensions of value that customers care about?" and "How do competing brands [offerings] fare on these dimensions?" (Treacy and Wier-
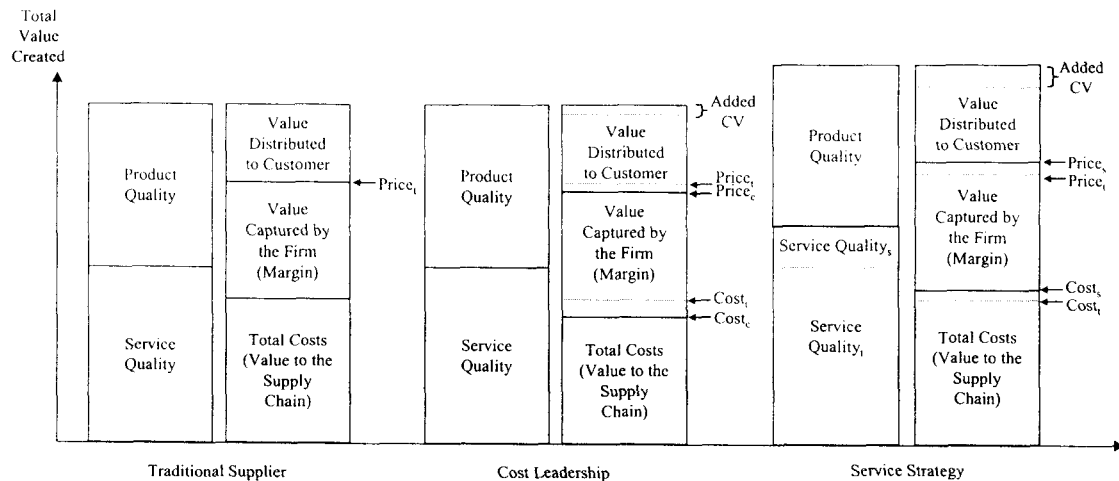
FIG. 1. The relative nature of customer value.

sema 1995). The former has been examined at great length, both within and outside of the forest products industry. The most common approach has been to measure the "importance" of attributes/dimensions affecting various customer decisions, typically purchasing decisions. For illustrative purposes, examples of this technique include: Eastin et al. (1999), examining the importance of various attributes impacting material substitution in the residential construction industry; Smith and Smith (1999), identifying trade shows as the most important promotional medium impacting woodworking machinery purchases; Roadcap et al. (2000), presenting attributes important to the implementation of EDI technologies within the home center industry; and Forbes et al. (1994), examining attributes influencing lumber purchases in the furniture industry. Within this approach, researchers generally suggest that the highest scoring attributes are those creating the greatest value to respondents; however, few articles have studied perceived value as a focal construct (Sinha et al. 1998; Reddy and Bush 1998). The latter question of competitive benchmarking in customer value analysis has usually taken the form of simple mapping procedures (Gale 1994). However, recent research has examined more complex models of comparative customer value to map

competitive offerings (Sinha and DeSarbo 1998) and to examine its relationship with market share (Rust et al. 1999).

Although Reddy and Bush (1998) provide an interesting model to estimate customer trade-offs between product quality, price, and perceived product value of softwood lumber, the author is unaware of research investigating the performance of multiple forest products suppliers in an effort to determine sources of high customer value assessment in a competitive environment. This article begins by providing a basic framework for customer value within a competitive environment. Next, the author discusses the importance of various product/service attributes in identifying sources of customer value, examining first a series "importance" ratings, followed by the development of a logistic regression approach focused on supplier performance. Finally, conclusions and managerial implications for the hardwood lumber industry are presented.

THE CONCEPT OF CUSTOMER VALUE

To graphically illustrate the concept of value and value-added strategies, the author has adapted concepts developed by Irwin Gross (1997) and Roger Best (1999), depicted by the traditional supplier in Fig. 1. Within this

framework, value is created by supplying through proprietary advantages in product quality over competition and through more convenient and/or cost-effective service offerings than those of competitors. The central focus of these value-creating activities centers on the relativity of offerings. Value in industrial markets is not determined in a vacuum, but rather vis-à-vis competing products or services acquired to fulfill a particular business function. Therefore, the nature of value in business markets is primarily economic. Suppliers most typically compete based on their ability to improve customers' operations relative to the next best solution, either internally generated or out sourced.

Once value is created, delivering value to the customer is a function of how it is allocated between stakeholders. First, a portion of the value created is directed to the supplier's supply chain. The creation of value does not come without a cost. The supplier must allocate a portion of the offering's value to raw material suppliers, personnel, power, transportation and delivery expenses, and so on. The supplier's total costs of production represent value created by all players in the supply chain up to this point (it is important to note that each of these costs represents an earlier value analysis, beginning with the price charged for the total value delivered to the supplying company in our example). Once production costs are accounted for, the supplying firm captures some proportion of value in the form of a profit margin. Supplying firms must capture an appropriate return in order to continue operations. Contrary to the popular axiom, "value is whatever someone is willing to pay," in this model, customer value is a strategic decision to leave enough value on the table to motivate customers to buy.

Two important caveats need to be discussed when applying this type of customer value framework: segmentation and competition. First, each value assessment (i.e., the determination of total value created through product and service quality, the costs of delivering the offering, and the ability to capture value

in the form of profit) is highly dependent on the attitudes and behaviors of customer segments (Zeithaml 1988; Bolton and Drew 1991). Therefore, value measurements are most meaningful when specifically targeted segments of the market are examined. Second, customer value becomes operational only when examined relative to competitive offerings. To illustrate this point better, the conceptual framework developed in Fig. 1 has been expanded to illustrate competitive pressures based on two hypothetical value-oriented strategies: service and cost-leadership. Within these illustrative examples, the traditional supplier discussed above represents a baseline for comparison against two other competitors targeting the same customer segment.

The first example represents a typical cost-leadership strategy employed by many commodity-oriented manufacturers during the past decade. Through various manufacturing and administrative process improvements, this competitor has effectively reduced overall costs of production without affecting product or service quality. This cost reduction is then allocated in a way that adds value to the customer through a price reduction ($price_t - price_c$). Suppliers must also be motivated to provide value-added products and services; thus the company captures a portion of the value created by the cost reduction through increased margins (price reduction to customers is less than the overall cost reduction) and the potential for increased market share.

The second competitor represents one competing on a service quality strategy. This hardwood lumber producer may, for example, provide an additional length sort targeted to this customer segment, thus eliminating a similar sorting process at the buyer's facility and increasing material utilization. Given the supplier's excess capacity in its current sorting operations (i.e., additional plant space, idle employees, etc.), it is able to absorb the cost of this additional sorting process with minor cost implications ($cost_s - cost_t$). The benefits of a length-sorted product offering are then positioned to provide a significant return to the

supplier, while adding customer value by substantially decreasing the customer's total costs (the cost reduction from reduced sorting and increased yield [service$_s$] minus the price premium of length-sorted lumber [price$_s$ − price$_t$]). By viewing customer value in this way, we are able to examine comparative customer value ratings of hardwood lumber suppliers (i.e., the value distributed to the customer), and begin to tease out the product, service, and price attributes most influential in the determination of those ratings.

METHODS

A mail survey instrument was designed to address customer perceptions related to customer value, competitive benchmarking, and product purchasing behavior. The initial questionnaire was administered on November 30, 1999, with a follow-up survey mailed on December 14, 1999. A convenience sample of 460 U.S. purchasers of hardwood lumber was identified based on customer and prospect lists of two hardwood lumber operations in the upper Midwest. Cost restraints and proprietary objectives restricted the sample size to current and potential customers of the research sponsors. Of the 460 mailings, 9 surveys were returned as nondeliverable or were returned by the company indicating that its business operations were not appropriate for the study. In total, 110 usable responses were returned, resulting in an adjusted response rate of 24.4% (110/[460-9]). It is important to note that although the subjects represent a subset of buyers potentially predisposed to the purchase of northern hardwoods, their responses relate to all of their hardwood lumber purchased regardless of the source's origin.

RESULTS AND DISCUSSION

Respondent profile

The majority of U.S. buyers are located in the Great Lakes and Midwest region (Fig. 2). Nearly 63% of respondents operated in these two regions. Western and Southeastern respondents were fairly well represented with
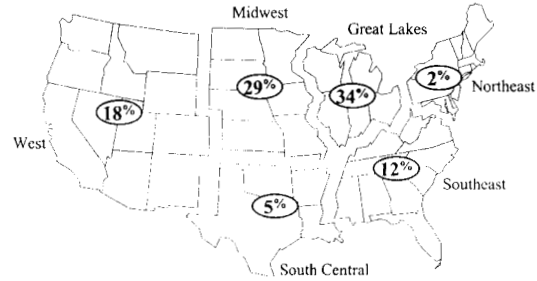

FIG. 2. Respondents by geographic region (n = 108).

18% and 12% operating in these regions, respectively. However, very few respondents came from the South Central and Northeast regions. Red oak was the species purchased by the greatest number of respondents (82% of respondents indicated purchasing this species from at least one of their top three suppliers), followed by hard maple (62%), and black cherry (51%). Those purchasing black cherry generally purchased very little of the species; on average, only 10% of these customers' purchases (in terms of volume) were black cherry. In terms of volume, 34% of the sample's reported purchases were red oak, 15% were hard maple, and 9% were poplar. Basswood, ash, and soft maple were the next most purchased species by volume, representing 7%, 6%, and 6% of the sample's purchases, respectively.

Respondents were also asked to indicate their companies' primary line of business. The largest percentage of respondents indicated lumber distribution as their primary line of business. Lumber distribution was indicated by 35% of responding companies. The more traditional hardwood lumber buyers followed (hardwood components, 12%; millwork, 12%; furniture, 11%; and cabinetry, 10%). Overall, nearly 90% of respondents indicated either an upper-level management position or a marketing/sales middle-level position. This would suggest that the vast majority of individuals responding to the survey are aware of the purchasing decisions of the company and are knowledgeable in the content of the survey subject matter.

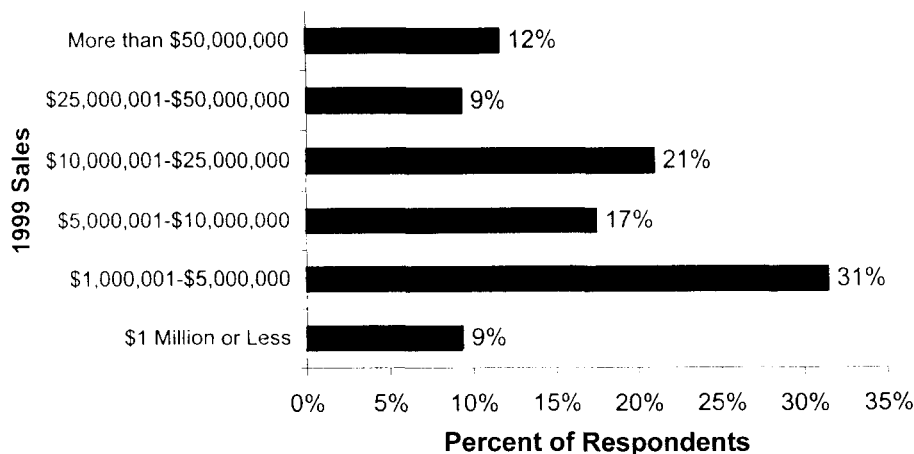Self-reported 1999 projected sales were

FIG. 3.   Reported 1999 Sales of Respondents.

used as a measure of respondent company size, and are presented in Fig. 3. The largest percentage of respondents were from companies with sales between $1 million and $5 million, followed by those with sales from $10 to $25 million. These sales volumes were generated by 109 employees, on average, with furniture and cabinet manufacturers employing the most people (155 and 342, respectively) and millwork and component manufacturers employing the fewest people (73 and 59, respectively). Although the purpose of this paper is not to provide a profile of purchasers of hardwood lumber, respondent data are relatively consistent with past research examining hardwood lumber buyers (Idassi et al. 1994; Bush et al. 1990; Tripp-Umbach 1999). Given the nonrandom nature of the survey design, statistical inference cannot be made to a larger hardwood buyer population. However, in practice, segmentation within business-to-business markets (i.e., the development of homogeneous subsets of current and prospective customers) has historically been conducted around size, industrial classification, and geographic location (Lilien 1987). Therefore, the firmographic similarities of the study's respondents to those of more statistically valid sampling schemes indicate that in addition to the academic insight gained from examining multiple measures of customer value, managerial insight may be gained into the perceptions of hardwood lumber purchasers of like size, business focus, and location.

Importance ratings of product/service attributes

Respondents were first asked to rate the relative importance of product and service attributes as they relate to their hardwood lumber purchasing decisions. Results from these questions are listed in Table 1. Consistent thickness, on-time delivery, and competitive price were indicated as the three most important product/service attributes related to hardwood lumber purchases. Availability of environmentally certified products and custom drying services were assigned the lowest importance scores.

Utilizing one-way analysis of variance tests, significant differences among importance ratings were found to exist between business lines, indicating implications for segmentation strategies. Respondents indicating cabinetry as their primary line of business reported high levels of importance in the areas of consistent color, texture, and grain and the geographic region from which the lumber was sourced, compared to those operating in other lines of business. In sharp contrast to cabinetry respondents—and in many ways lumber distrib-

TABLE 1. *Mean importance factors of product/service attributes.*

Product/service attributes	n	Mean	Std. deviation
Consistent thickness	109	6.266	1.015
On-time delivery	109	6.165	1.067
Competitive price	109	6.138	1.041
Availability of desired species	110	5.836	1.138
Consistent color	109	5.688	1.538
Lumber sourced from preferred geographic region	109	5.495	1.470
Order handling	109	5.083	1.467
Texture and grain	109	4.954	1.566
Payment terms	109	4.890	1.449
Expertise of salespeople	109	4.862	1.462
Long lengths (9 ft. and longer)	109	4.569	1.674
Packaging	108	4.269	1.532
Thickness options	109	4.147	1.860
Availability of custom drying	107	3.673	2.244
Availability of environmentally certified products	109	2.762	1.683

[1] Importance ratings are based on a 7-point scale, where 7 = very important to hardwood lumber purchasing decisions and 1 = not at all important.

utors, component manufacturers, and furniture producers who placed their greatest emphasis on color and a geographically specific source—blind/shutter and flooring respondents were relatively uninterested in issues of color, texture, or thickness options, but were most interested in favorable payment terms.

Although one might quickly conclude that those attributes rated the highest in terms of importance are areas deserving the central focus in the market planning process, additional analyses examining the performance of suppliers yield slightly different results. Although the issues of consistent thickness, competitive price, and on-time delivery are certainly important to buyers of hardwood lumber, these attributes may more closely represent a suppliers "ante" into the game of hardwood lumber supply. In other words, it could be argued that these attributes are those necessary to merely engage in the business of selling hardwood lumber, and not the ones adding the necessary value to influence purchases, maintain customer loyalty, or demand any sort of price premium over competition. The following analysis attempts to examine the ability of product/service attributes to explain differences in the level of value delivered by hardwood lumber suppliers.

Determinants of customer value

The value construct.—In addition to rating the importance of product/service/price attributes on purchase decisions as a whole, respondents were asked to rate their top three (volume) suppliers' performance in areas similar to those discussed previously in Table 1 on a five-point "excellence" scale (5 = excellent, 1 = poor). Respondents were also asked to rate each supplier on the higher-order variable of "overall value delivered by supplier" (5 = excellent, 1 = poor). Prior research has indicated that behavioral changes, particularly loyalty, among customers tend to be intensified when differences in value are perceived relative to competition (Jones and Sasser 1995; Rust et al. 1999; Gale 1994). Supporting this postulation, a preliminary examination of respondent data supports that value, purchase volume, and relationship appear to be related (see Table 2). Respondents' largest volume suppliers accounted for over 52% of purchases made from suppliers listed (approximately one third of total purchases). Suppliers ranking second and third in terms of volume accounted for 27% and 21% of purchases from, respectively 16% and 13% of total purchases. Using paired samples t-tests, significant differences in purchase volume ex-

TABLE 2. *Purchase volume, relationship, and customer value perceptions of respondents.*

	Top suppliers by volume			
	Suppliers ranked #1	Suppliers ranked #2	Suppliers ranked #3	Significance[1]
Percent of purchases[2]	52.67	26.78	20.55	1 > 2, 2 > 3, 1 > 3
	(n = 75)	(n = 75)	(n = 75)	
Relationship (years)	7.95	7.43	5.88	1 > 3, 2 > 3
	(n = 80)	(n = 75)	(n = 62)	
Perceived value delivered[3]	4.39	4.13	3.96	1 > 2, 2 > 3, 1 > 3
	(n = 94)	(n = 90)	(n = 82)	

[1] Paired-samples t-tests were used to test for differences in variable means between categories of suppliers for each respondent (α = 0.05). For example, "1 > 2" indicates that the variable mean of supplier ranked #1 is significantly greater than the variable mean of supplier ranked #2, at the 95% confidence level.
[2] Percent of top three suppliers' purchases. Top three purchasers account for approximately 62% of respondents' total purchase volume in 1999.
[3] Perceived value delivered by supplier is measured on a 5-point scale, where 5 = excellent and 1 = poor.

ist between each supplier category, at the 95% level of confidence. In addition, the buyer/supplier relationship, in years, progresses directionally in a like manner (the average number of years purchasing from top suppliers is 8.0 years, followed by 7.4 and 5.9 years for second- and third-rated suppliers, respectively). In this case, the relationship appears to be most impacted outside a customer's top two suppliers, in that the average number of years conducting business with a third-ranked supplier is significantly lower than first- or second-rated suppliers (α = 0.05). Similarly, respondents' largest suppliers were seen as providing the greatest degree of value (4.39 on a 5-point scale), while suppliers ranked second and third received value scores of 4.13 and 3.96, respectively. Significant differences in customer value were detected between each of supplier categories. Although a causal link is not proven through this analysis, suppliers viewed by customers as providing higher relative value, on average, supply larger volumes of lumber and maintain longer relationships.

Although customer value delivered was measured using a five-point scale, in the following analysis customer value is modeled dichotomously. Two previous studies predominantly influenced this line of analysis, Jones and Sasser (1995) and Sinha et al. (1999). Jones and Sasser found that within highly competitive markets (defined as markets with low product differentiation, substantial customer indifference, many substitutes, and low

switching costs—markets quite similar to those of hardwood lumber) completely satisfied customers were significantly more likely to repurchase a firm's products than just satisfied customers. They also found that even a slight drop from complete satisfaction created an enormous drop in loyalty. Although satisfaction and customer value are not entirely synonymous, a similar relationship can be reasonably hypothesized, whereby even a slight deviation from "excellent" value delivery may have severe consequences. Similarly, Sinha et al. (1999) modeled the effect of perceived customer value on customer loyalty where individuals were categorized as being either "loyals" or "non-loyals" based on "noticeable dichotomies . . . along perceptual and behavior variables." In addition, this study provides evidence linking customer value perceptions to loyalty, whereby relatively little movement on the value scale resulted in reassignment between loyalty groups (mean value rating of loyals equaled 4.03 compared to 3.42 for non-loyals). While not explicitly modeled, the data collected in this study also express similar tendencies. Even at relatively high levels of customer value, a 10% reduction in perceived value delivered by suppliers (the difference between first- and third-ranked suppliers, 4.39 to 3.96 on a five-point scale) corresponds with a 61% reduction in purchase volume (52.67% versus 20.55%, respectively) and a 26% reduction in customer tenure (7.95 versus 5.88, respectively). Each of these ex-

amples indicates that a customer's movement along a value scale is of primary concern to a supplying firm once a critical hurdle rate is overcome, the rate by which a customer's behavior is impacted, whether it be a measure of purchasing volume or loyalty.

A logistical regression approach.—Given the focus of this study on respondents' best suppliers and the relatively high degree of overall value delivered by the suppliers identified in this study ($\mu = 4.15$ [S.D. $= 0.788$]), "excellent" or "significantly above average" value was identified as a rating of 5 on the overall value scale (n = 70); suppliers receiving these ratings are classified as "high value" suppliers throughout the paper. All other ratings (1–4) were classified as "less than excellent." The supplier ratings (up to three ratings per respondent) were then stacked so that supplier performance ratings could be analyzed in aggregate. This process yielded 192 complete sets of performance ratings, each containing the performance ratings for the 15 product/service attributes, a measure of competitive price, and the supplier's corresponding overall value category. Supplier performance scores were removed from the analysis if any one of the seventeen questions was omitted.

A logistic regression approach is employed to examine the attributes influencing the probability of a suppliers being classified as providing substantially above average customer value, relative to other suppliers. Table 3 provides selected descriptive statistics of variables analyzed. Nearly 35% of the suppliers rated were classified as providing high levels of customer value. The product/service and price attribute means are based on respondent ratings of suppliers on the five-point "excellence" scale described above (5 = excellent, 1 = poor). Overall, consistent thickness and salesperson expertise were rated highest, indicating that the industry is providing high levels of product quality and service in these areas. Ability to place orders electronically and the availability of environmentally certified products were rated poorest in terms of supplier performance; however, these attri-

TABLE 3. *Descriptive statistics for supplier performance ratings.*[1]

Product/service attributes	n	Mean	Std. deviation
Consistent thickness	192	4.224	0.777
Salesperson expertise	192	4.208	0.855
Payment terms	192	3.948	0.936
Packaging	192	3.938	0.884
Competitive price	192	3.932	0.927
Consistent color	192	3.807	0.970
Order handling	192	3.802	0.977
Texture and grain	192	3.797	0.866
Availability of species	192	3.776	0.953
On-time delivery	192	3.766	0.983
Preferred geographic source	192	3.712	1.039
Long lengths (9 ft. plus)	192	3.611	1.106
Thickness options	192	3.422	1.178
Custom drying	192	2.927	1.423
Availability of certified product	192	2.573	1.308
Electronic ordering	192	2.172	1.214
High value[2]	192	0.349	0.478

[1] Supplier performance ratings are based on a 5-point "excellence" scale, where 1 = poor and 5 = excellent.
[2] High value is defined as suppliers receiving significantly higher than average overall value ratings, where 1 = above average value delivered and 0 = average to low value delivered. Descriptive stats are provided for cases in which the respondent rated a supplier on all product/service attributes and assessed the overall value delivered, only. Therefore, nearly 35% of suppliers rated were categorized as "high value" suppliers.

butes were also seen as being of least importance to respondents. Availability of certified products was rated as the least important of all product/service attributes (see Table 1). In a separate line of questioning not discussed directly in this paper, respondents rated placing orders on line as the least important technology-driven activity affecting their businesses ($\mu = 2.84$, where 1 = not at all important and 7 = very important). It is important to note that on-time delivery, the second most important attribute to respondents (Table 1), was rated the tenth best in terms of supplier performance (Table 3). The mean performance rating for on-time delivery was 3.75, a value significantly lower than 4.0 at the 95% confidence level.

As mentioned previously, a logistic regression model is used to estimate the factors that influence the likelihood of a supplier as being categorized as providing above average customer value. The results from the overall model (Table 4) indicate that high performance rat-

TABLE 4. *Coefficients for overall logistic regression function* $(n = 197)$[1].

| Dependent Variable: High Value (Above average = 1, Average/low = 0)[2] | | | | |
Variable[3]	B	Wald	Sig.	Exp(B)
Packaging	0.783	11.084	0.0009	2.187
Availability of desired species	0.967	14.481	0.0001	2.630
On-time delivery	0.814	13.660	0.0002	2.256
Constant	−10.794	43.173	0.0000	

[1] Estimating function employed is of the form: $\ln[p/(1 - p)] = b_0 + b_1x_1 + b_2x_2 + \ldots + b_ix_i + e$. A forward conditional stepwise procedure was used to identify variables included in the model.

[2] Model Chi-square = 75.76 (df = 3, sig. = 0.00). Model correctly categorizes 78% of suppliers.

[3] In order to reduce the effects of multicollinearity, three variables were removed from the analysis due to high pairwise correlation coefficients (CC) with other variables in the model: Texture and grain (consistent color, CC = 0.81), Lumber sourced from preferred geographic region (consistent color and availability of desired species, CC = 0.56 and 0.52 respectively), and long lengths (packaging, CC = 0.45). Removal of these variables had little effect on the variables included in the model or the magnitude and direction of their coefficients.

ings in the areas of availability of desired species, packaging, and on-time delivery most influence exceptional customer value perceptions. All coefficients of these variables are significant at the 0.01 level (99% confidence level), and the overall model is significant at the 0.01 level according to the model chi-square statistic. The "odds ratios" (ExpB) suggest that a supplier would be approximately 2 to 2½ times more likely to be seen as a high value supplier, if it were able to increase in any one of the included attributes by one unit (i.e., increasing a respondent's perception of the supplier's packaging from a 3 to a 4 on a 5-point excellence scale). Coefficients of three additional product/service performance attributes were also significant at the 0.05 confidence level (consistent color, consistent thickness, and lumber thickness options—lumber thickness options being the only significant coefficient negatively related to high value). However, the inclusion of these variables resulted in only modest gains to the predictive power of the model. The number of cases correctly classified by this expanded model increased only one percentage point (78.13% to 79.17%). Therefore, these variables are not included in the model presented in Table 4.

In addition, the procedure used to estimate the function for the overall sample of hardwood purchasers was repeated for three broad buyer segments: furniture and cabinet manufacturers, distribution companies (including both wholesalers and retailers), and millwork,

flooring, and component manufacturers (Table 5). A supplier's ability to consistently have available the species sought by buyers consistently remains a dominant determinant of customer value across segments. Similarly, packaging was included in the customer value models developed for the furniture/cabinet and distribution segments. However, differences are seen between segment value perceptions in the areas of consistent color and the ability to place orders electronically. Furniture and cabinet manufacturers viewed consistent color as a significant determinant of customer value. Consistent color and texture and grain are very highly correlated (0.81); therefore the interpretation of consistent color may be more broadly defined as an overall evaluation of visual appearance (including color, texture, and grain). Conversely, buyers in the business of reselling hardwood lumber valued suppliers able to transact business electronically, although less than 6% of these respondents actually buy on-line. Although it is important not to read too much into this finding, the results indicate that lumber distribution companies operating under increasingly tighter margins are beginning to place a higher value on technology. A lumber supplier servicing this segment who is perceived as having substantial e-commerce functionality is at least two times more likely to be viewed as a high value supplier.

Finally, the role of price in suppliers' value propositions should not go unnoticed. In no case, overall or within segments, was compet-

TABLE 5. *Segment specific models examining high value suppliers.*

Dependent Variable: High Value (Above average = 1, Average/low = 0)[1]				
Variable	B	Wald	Sig	Exp(B)
Furniture/Cabinet Segment (n = 48)[2]				
Consistent color	1.332	5.778	0.016	3.789
Packaging	1.640	4.907	0.027	5.154
Availability of desired species	2.858	4.878	0.027	17.428
Constant	−25.204	8.191	0.004	
Distribution Segment (n = 74)[3]				
Packaging	1.235	8.882	0.003	3.437
Availability of desired species	0.960	7.852	0.005	2.611
Ability to place orders electronically	0.714	6.370	0.012	2.043
Constant	−10.869	17.124	0.000	
Millwork/Flooring/Component Segment (n = 55)[4]				
Availability of desired species	1.407	9.630	0.002	4.085
Constant	−6.033	10.134	0.002	

[1] Estimating function employed is of the form: $\ln[p(1 - p)] = b_0 + b_1x_1 + b_2x_2 + \ldots + b_ix_i + e$. A forward conditional stepwise procedure was used to identify variables included in each of the models.
[2] Model Chi-square = 30.76 (df = 3, sig. = 0.0000). Model correctly categorizes 81% of suppliers rated by respondents in the furniture/cabinet segment.
[3] Model Chi-square = 25.84 (df = 3, sig. = 0.0000). Model correctly categorizes 72% of suppliers rated by respondents in the distribution segment.
[4] Model Chi-square = 14.68 (df = 1, sig. = 0.0001). Model correctly categorizes 69% of suppliers rated by respondents in the millwork/flooring/component segment.

itive price a driving force in the value equation. Although price is an important factor influencing the purchasing decisions of respondents, price was not a discriminating factor when it came to identifying high value suppliers. This finding supports a fairly broadly held belief among researchers, that price does not create value for customers, thus making it extremely difficult—if not impossible—to build competitive advantage around a low price strategy (Anderson and Narus 1999; Nagle and Holden 1995; Porter 1985).

CONCLUSIONS

These results have strong implications for both researchers and practitioners. First, although customer importance ratings are important tools for assessing need, this research points to potential difficulties associated with equating "important" attributes and "value-adding" activities. Although consistent thickness and competitive price were among the most important attributes affecting purchase decisions, supplier performance on these attributes did little to influence customer perceptions of high value. Similarly, the ability to transact on-line plays an extremely small role

in current purchasing decisions, but was positively related to a supplier's ability to be viewed as providing high customer value. Researchers, and practitioners alike, must be cautious when interpreting importance ratings of respondents. If importance does not translate into differentiated value assessments, suppliers will be investing operations and marketing dollars inappropriately. Especially in the commodity driven market of hardwood lumber, suppliers must focus on providing products and service that lead to differentiated value in order to build loyalty among customers.

Second, this study suggests that the most critical attribute influencing high levels of overall value is the consistency with which suppliers have the requested species available when the customer needs it. As manufacturing and inventory systems continue to move toward just-in-time principles, suppliers most capable of providing consistent and comprehensive inputs stand to gain. Just as Ford cannot afford to source parts for their automobiles from suppliers who are able to meet their needs one month but not the next, secondary manufacturers and resellers of forest products cannot afford to continue managing countless

relationships with inconsistent sources of supply. This research suggests that suppliers with the most consistent source of supply will more often be viewed as delivering high levels of value. Therefore, a strategy developed around species specialization may be warranted. For example, a hardwood concentration yard may reduce purchasing efforts and inventories of red oak, in order to redirect resources toward long-term relationships with targeted suppliers of hard maple. This same supplier may also have to consciously decide to distance itself from, or disengage in, business relationships involving predominately red oak customers in order to provide higher value to a core segment of hard maple buyers.

Third, aesthetic qualities of shipments play an important role in distinguishing sources of high value supply. Most notably, packaging emerged as a significant determinant of value in two of the three segments examined, as well as in the overall analysis. Given these findings, suppliers able to improve the appearance of bundles through better stacking practices and consistent and branded strapping/markings stand to significantly improve customer value perceptions, and consequently enhance loyalty. In the short-term, improvements made in packaging may be the easiest and least expensive means of improving value perceptions. In addition to packaging, aesthetically based sorts—color, texture, or grain pattern—may be another way for suppliers to differentiate the value of their offerings to specific segments. The data suggest that the furniture/cabinet buyer segment is responsive to this strategy.

Finally, this research highlights the necessity of segmentation strategies. The results in this paper reveal distinct differences in value perceptions between customer segments. The determinants of value can be quite different from one buyer to the next. Even among very broadly defined segments, the factors determining high value varied. Additional research is needed to more accurately identify buyer segments that share common values. More elaborate segmentation methods are needed to further segment hardwood lumber buyers by

geography, product species and/or dimension, company size, or operation. Only when value is defined operationally, can a firm manage a value-oriented strategy—coordinating operations, communications, and product positioning around segment specific targets of performance relative to competition.

LIMITATIONS AND FUTURE RESEARCH

This study has several limitations, which provide useful avenues for future research. First, this study makes use of a convenience sample. Although it is tempting to generalize the above results to other companies operating within the hardwood lumber industry, to do so would be beyond the scope of the study. Replications of this exploratory work incorporating statistically valid samples of key lumber buying segments would allow for broader generalizations to be made. Second, although the data suggest that value perceptions of suppliers are related to purchase volume, additional research is needed to better link the concepts of customer value, loyalty, and purchase behavior within business markets. Third, this study examines issues of product, service, and price attributes, in regard to their relationship with customer value. While significant relationships were surfaced, effects of brand image, relationship, and trust on customer value were not addressed. Future studies examining these dimensions in a competitive environment would certainly improve our understanding of the value construct.

Although the results from this study require confirmation from a broader examination of purchasers' value perceptions, the author believes that practitioners can usefully adapt the general principles of this paper in their value propositions to customers and prospects. From an academic perspective, and in a broader context, the author hopes that this work will encourage additional research, within the forest product marketing arena, improving the field's knowledge of customer value measurement.

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