Hardwood Supply Chain and the Role of Log Brokers in 2012

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Abstract

The recent economic crisis has greatly affected how companies conduct business. To be competitive, companies had to make changes to their product lines, distribution channels, marketing, and overall business strategies. This study was conducted to describe and analyze the log supply component of the hardwood forest products distribution chain and to investigate changes over the past 5 years. State forestry utilization and marketing specialists were interviewed to gain a regional overview of log distributions systems, followed by a survey that resulted in 57 responses from log distributors/brokers/wholesalers from 24 states. Results indicated that, on average, respondents received the majority of their logs from gatewood purchases, and the majority of logs purchased went directly into the sawmill market. From 2007 to 2011, logs sold to sawmill and veneer markets decreased by 6 and 7 percent, respectively, and logs sold to export markets increased by 30 percent. Respondents indicated that increasing fuel and trucking costs, followed by logger shortages, had the greatest negative impact on business operations. In contrast, increasing log exports had the greatest positive impact. Most respondents indicated that although current economic conditions have affected the way they conduct business, they have been able to find ways to adapt. Services such as providing log delivery, bucking logs to desired lengths, and procuring hard-to-obtain species helped companies in the log business remain competitive.

Hardwood lumber demand and use has fluctuated during the past 50 years. Although lumber is considered the most important product derived from eastern hardwood forests on the basis of total value, factors such as globalization, higher energy costs, material and product substitution, and the recent recession have had a negative impact on lumber demand and consumption (Luppold and Bumgardner 2008).

Buehlmann et al. (2010) and Espinoza et al. (2011) conducted a study of hardwood lumber manufacturers and distributors in the fall of 2008 to assess changes and adaptions made within the industry to address market shifts experienced over a span of 5 years. The study found that average hardwood lumber sales by manufacturers had decreased by 13.2 percent from 2004 to 2009 (Espinoza et al. 2011) and that customers now requested smaller orders more frequently. In responding to market pressures and the economic downturn, hardwood lumber distributors indicated they were offering various services to their customers at a significantly higher rate in 2008 compared with 2003. Certified product offerings, finishing services, custom moulding and priming, special grading, and many other services were offered by hardwood lumber distributors more commonly in 2008 as compared with 5 years earlier (Buehlmann et al. 2010).

It is logical to expect that businesses throughout the hardwood supply chain are similarly adapting their marketing and sales strategies and pursuing new opportunities in order to remain viable. To more fully understand the types and magnitudes of change to the hardwood log industry that have been brought on by a combination of globalization, material substitution, economic conditions, and other factors, expanding our understanding of the

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workings of the industry (the upstream end of the hardwood distribution channel) is important to assure the long-term viability of the US hardwood industry. In particular, this research focused on the log broker/log wholesaler component of the hardwood distribution channel, and the study's objectives were to identify and describe log trading mechanisms between landowners, log brokers, and sawmills. Furthermore, the study aimed to elucidate strategies for log procurement, the impact of global trade, customized offerings, response time to orders, and the relationship between sawmills and log brokers.

Materials and Methods

Initial insights on hardwood roundwood distribution systems in the Eastern United States were gained by interviewing eight state Division of Forestry/Natural Resources utilization and marketing specialists. Specialists from Minnesota, Kentucky, Indiana, Vermont, Connecticut, New York, West Virginia, and Virginia were interviewed in free-flowing discussions that were driven by eight questions: two focused on logger demographics, five on the roundwood supply chain, and one specifically about log brokers/wholesalers. These individuals were selected for interviews due to their years of expertise, their willingness to participate, and their availability—several eastern states do not have a utilization and marketing specialist on their forestry staff.

Subsequently, a mail survey involving all known hardwood log buyers/wholesalers in 24 major hardwood producing states (Connecticut, Delaware, Iowa, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, North Carolina, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Tennessee, Virginia, Vermont, Wisconsin, West Virginia) was composed and conducted by Virginia Tech. The questionnaire contained 24 questions and was accompanied by a cover letter explaining the study.

Questionnaire and data collection

Owing to the large number of questions involved, The Tailored Design Method (Dillman et al. 2009) was used for data collection. The questionnaire included four sections pertaining to (1) firm characteristics (eight questions); (2) log acquisition and distribution characteristics (seven questions); (3) markets served and services provided (four questions); and (4) perceptions about current business environment (five questions). When trends were of interest, data for 2007 and 2011 were requested. Question types and measures included categorical (multiple choice), rating (5-point scales), and open-ended, where respondents either filled in a blank to indicate volume (e.g., board feet sold), a percentage (e.g., percentage of volume sold that was white oak), or longer written responses to more general questions.

An address list was compiled using forest products directories maintained by some of the states along with Internet business listings, resulting in 698 addresses to which the questionnaire was mailed. The questionnaire was reviewed by the eight utilization and marketing specialists, three members of academia, and two log buyers as a pretest; some minor adjustments were made based on their feedback. After correcting for undeliverable addresses (111), respondents not in the hardwood log business (89), closed businesses (4), and rejected participation (2), the adjusted number of questionnaires mailed was 492. The mailing started in May 2012 with a postage-paid return questionnaire accompanied by a cover letter, followed by a reminder postcard after 2 weeks. A second mailing, 2 weeks later, consisted of a postage-paid return questionnaire accompanied by a cover letter and was followed by a second reminder postcard after another 2 weeks. The survey concluded in July 2012. Fifty-seven usable questionnaires were obtained for an adjusted response rate of 11.6 percent. However, it is reasonable to assume that the percentage of nonresponding businesses that were part of the survey population that had closed or were not involved in hardwood log trade was the same or higher than the percentage indicated by responses. Slightly more than 61 percent of respondents indicated they were not in this business. When this factor (61%) is applied to the nonresponding population and the resulting number is subtracted from the target population, the adjusted response rate is 25.2 percent. The challenge of obtaining correct addresses for a survey conducted in the hardwood industry, in general, and the hardwood log broker industry in particular, is the small size and transient nature of the industry sector. For this reason, states and industry associations have a difficult time maintaining accurate address databases.

Data measures and analysis

To observe whether similar trends existed throughout the hardwood supply chain, the mailed questionnaire sent to log brokers/wholesalers was designed to be consistent with the survey of lumber wholesalers/distributors conducted by Buehlmann et al. (2010). In addition to questions related to firm characteristics, respondents were asked to indicate the sources of logs received for 2007 and 2011, the grades of logs purchased in 2011, the market segments logs went to in 2007 and 2011, and the countries to which logs were exported. Respondents also were asked to indicate services (from a predetermined list of nine services) they were offering to customers and were asked to rate the demand for these services on a 5-point scale anchored by 1 (very low demand) and 5 (very high demand). Respondents also were asked to rate their level of agreement with a predetermined list of nine statements concerning business functions on a 5-point scale anchored by ''strongly disagree'' and ''strongly agree.'' In terms of factors affecting their business, respondents were asked to rate 16 factors (10 related to raw material procurement and 6 related to log transportation and storage) on a 5-point scale anchored by 1 (major negative effect) and 5 (major positive effect). Lastly, respondents were asked to answer three open-ended questions regarding the future of domestic log distribution, factors that influenced log procurement decisions and strategies, and general comments regarding log purchasing activities.

Simple descriptive statistics were used to evaluate responses to each question. SAS's PROC GLIMMIX, a generalized linear mixed model procedure that allows for correlation among responses, was used to contrast log sources and log markets reported by respondents for the years 2007 and 2011.

Assessment of potential nonresponse bias

To test for nonresponse bias, early respondents and late respondents were compared by contrasting the response results of two demographic and two operational attributes

for the two groups. Respondents were categorized in four ''waves,'' corresponding with each mailing (two questionnaires and two postcards). The number of the respondents in each wave was 29, 6, 13, and 9. The cutoff to separate early from late respondents was the mailing of the second questionnaire, resulting in 35 early respondents and 22 late respondents. This practice assumes that late respondents have similar characteristics to those of nonrespondents and thus can be used as a proxy for nonrespondents (Armstrong and Overton 1977, Dalecki et al. 1993, Etter and Perneger 1997, Lahaut et al. 2003). The two demographic attributes that were compared were (1) region where company was located (Midwest, Northeast, South) and (2) number of employees. The operational variables that were compared were (1) whether the respondents purchased specialty logs and (2) the volume of logs purchased annually.

Pearson chi-square test, a nonparametric statistical analysis ($\alpha = 0.05$), was performed to compare early and late respondents on the two categorical variables (region where company was located and whether specialty logs were purchased), and logistic regression was used for the two continuous variables (number of employees and volume of logs purchased). No significant differences were found between early respondents and late respondents in regard to geographical location ($P = 0.8798$), number of full-time employees in 2011 ($P = 0.1258$), total volume of logs purchased ($P = 0.4816$), and whether or not the company purchased any specialty logs in 2011 ($P = 0.6176$). Thus, it was concluded that nonresponse bias was not present, and the obtained responses may be considered representative for the larger population of log brokers/wholesalers.

Firm characteristics

Seventy percent of all respondents were solely in the log buying/wholesaling business. In addition, 14 percent of the responding log brokers/wholesalers listed sawmill operation as their primary business. A few respondents were involved in pallets, veneer, chip, and pulpwood production, but fewer than five firms were involved in each of these individual categories. More than one-half of the respondents conducted business in a single facility (54%). The largest concentration of respondents was in the Midwest (47%; Iowa, Illinois, Indiana, Michigan, Minnesota, Missouri, Ohio, Wisconsin), followed by the South (28%; Delaware, Kentucky, Maryland, North Carolina, Tennessee, Virginia, West Virginia), and the Northeast (25%; Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont). Companies located in the West were not surveyed for this study because hardwood harvest in the West represents a very small proportion of overall hardwood harvest (approximately 5.2%; US Department of Agriculture [USDA] Forest Service, Forest Inventory and Analysis 2010). The distribution of survey respondents was somewhat different from the distribution of hardwood harvests among these three regions (USDA Forest Service, Forest Inventory and Analysis 2011) with the Midwest, South, and Northeast having produced 32, 41, and 27 percent of the hardwood roundwood in 2011. Because most hardwood log brokers are very active in the trade of higher grade export and veneer logs and there are major concentrations of both in the Midwest (e.g., walnut logs and veneer mills), the distribution of responding log brokers seems to align with these high-value hardwood segments.

Study limitations

Limitations apply to the results obtained from this study as with all mail surveys (Alreck 2004). Results were most likely obtained from a single person within each responding company, and although respondents mostly were owners and/or members of management, the answers obtained may not necessarily reflect the perceptions of other decision makers within the company. In addition, because part of the survey requested historical data from respondents (some of it several years old), recall error may have impacted some of the data collected. Results are to be interpreted with caution, because the sample size is limited.

Interview Results and Discussion

A wide variety of observations on issues and opportunities in log supply were raised in the eight interviews that were conducted prior to survey administration. In describing changes in the supply of available loggers (seven of eight participants indicated there had been a recent decline in the number of loggers in their state), four of the state experts mentioned that loggers had migrated their businesses to serve the energy and road construction industries due to the downturn in demand for logs. Three of the participants referenced increased costs associated with higher fuel prices, and three mentioned problems with borrowing money as economic factors affecting the hardwood supply chain. In only two interviews did reference to ''niche markets'' arise, and only one person referred to ''enhanced relationships with customers'' as a strategy being undertaken by log suppliers to enhance business. These initial insights from the presurvey interviews with state specialists seem to indicate that log suppliers, many of whom are loggers but not log brokers, may not have taken on a ''needs fulfillment'' servicing approach to their customers to as large an extent as have lumber suppliers (Buehlmann et al. 2010, Espinoza et al. 2011).

Questionnaire Results and Discussion

Brokers'/wholesalers' hardwood log procurement

Survey respondents were asked a series of questions to determine the volume of hardwood logs acquired in 2011 and how the logs purchased were acquired. The average US hardwood log distributor who responded to this survey purchased 3.2 million board feet (mmbf) of hardwood logs in 2011, while the median value for log purchases was 1.7 mmbf. Only 30 percent of responding log brokers reported log purchases equal to or greater than the mean level of 3.2 mmbf/y. Total hardwood log purchases for the respondents were 160 mmbf (i.e., approximately 1% of total US hardwood log production; Howard and McKeever 2012). Forty-six percent of the respondents indicated their company bought land to acquire the logs on site.

Log brokers/wholesalers were asked to estimate the percentage of logs that came from gatewood, stumpage, other yards or mills, land owned by company, log brokers, and other sources in 2007 and 2011. In 2007, responding firms indicated that on average, 26 percent of their logs were purchased at the gate from loggers (Fig. 1). The reported percentage of logs acquired at the gate from loggers decreased to 20 percent in 2011 (a decrease of 22%). The mean reported percentage of logs acquired at the gate from

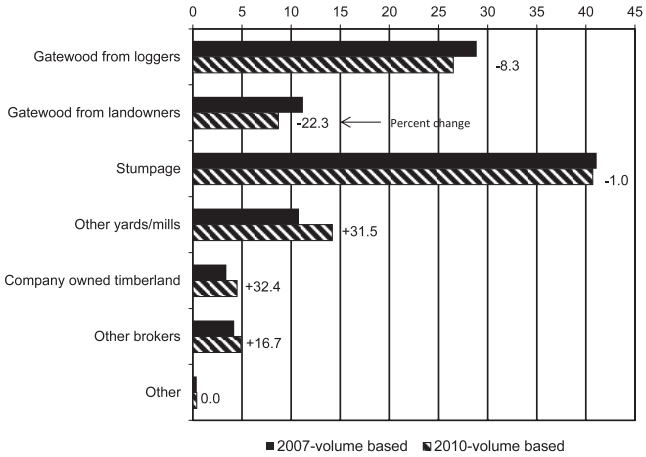

Figure 1.—Proportion of logs acquired from different sources in 2007 and 2011 as reported by 57 log brokers (volume-based percentages) and percent change.

landowners (–4%) and stumpage harvested by company-employed loggers (–20%) also decreased from 2007 to 2011. On average, the reported percentage of logs acquired from other yards or mills (+36%), land owned by the log broker/wholesaler company (+25%), stumpage from company contract loggers (+18%), and stumpage from independent loggers (+10%) increased from 2007 to 2011. Procurement of logs from other log brokers and other sources remained unchanged. It is important to note that while the year-over-year change, on a percentage basis, for some of these log sources was large from 2007 to 2011, the average percentage of logs acquired from some sources was relatively small (e.g., from company-owned land and company-employed loggers). Differences in log sources reported for 2007 and 2011 were not found to be statistically significant ($\alpha = 0.05$).

When the log source percentages provided by respondents are multiplied by the total volume of logs that each respondent reported having purchased in 2011 (50 of 57 respondents provided annual log volume data), a volume-based distribution of log sources is obtained (Table 1).[1] Differences between the mean reported log source distribution and the volume-based distribution point to possible differences between smaller and larger log dealers in the approaches they take to log acquisition (Fig. 1; Table 1). For instance, where the overall volume-based percentage is higher than the mean of the reported percentages, at least some of the firms that deal in larger volumes of logs are sourcing their logs from this class of suppliers more so than is true for all responding brokers. An example of this is seen in the stumpage percentages shown in Table 1, where the 2007 and 2011 stumpage volume percentages were 9.9 and 9.6 percentage points higher than the unweighted percentages for those same years, i.e., larger volume log brokers are buying more stumpage than smaller brokers. Another percentage mismatch is seen between the reported (non-volume-weighted) percentages of gatewood obtained from landowners (24% for 2007 and 23% for 2011) and the volume-weighted percentages (11% for 2007 and 8.7% for 2011; Fig. 1). In this case, the larger firms obtain a smaller percentage of their logs from gatewood delivered by landowners than do other firms.

These log procurement trends are generally consistent with those found in similar studies. A study conducted by the Appalachian Hardwood Manufacturers, Incorporated (Balkentier Consulting 2010, AHMI 2011) found that 46 percent of the log volume procured by Appalachian sawmills originated as stumpage as compared with the 41 percent in this study. Together, stumpage from these three sources (company-employed loggers, independent loggers, company contract loggers) comprises 41 percent of the log volume of responding log brokers/wholesalers in 2012. The AHMI study (Balkentier Consulting 2010) also found that an additional 42 percent of procured logs originated from logs received at the gate from loggers and land owners. Based on the current study, the gatewood component of total roundwood purchases for 2007 and 2010 was 40 and 35 percent, respectively. The AHMI study reported that only 2 percent of logs acquired by sawmills were from log brokers, and 10 percent were purchased from loggers in the woods (i.e., roadside). By comparison, these results indicate 5 percent of the logs were obtained from other brokers and 14 percent were obtained from other log yards (Table 1). These differences in log supply strategies seem to indicate that log brokers do more wholesale log trading than do sawmills; perhaps this is done to accumulate loads of logs that meet the requirements of specific customers.

Species distribution and log grades

To determine the types of logs sold, respondents were asked to provide species and log grade information. When asked to indicate their five highest volume hardwood species sold, white oak (*Quercus alba*) was cited most frequently (45 respondents). However, white oak constituted only 20 percent of the logs sold by those brokers supplying white oak. Red oak (*Quercus rubra*) was cited slightly less frequently (43 respondents) but constituted a higher proportion of logs sold (26%; Fig. 2). Thirty-four respondents named walnut (*Juglans* sp.) as one of the top-five species (third most frequently cited species) but the species made up 32 percent of the log sales, on average, for those who handled the species, with 8 of the 34 respondents indicating walnut made up 50 percent or more of their log sales and 2 respondents indicating it constituted 100 percent of their sales (Fig. 2). It is important to note that 25 of the 34 log distributors who indicated walnut was one of their five most important species were from the Midwest Region. In addition to walnut, a second example of brokers/wholesalers focusing on a specific species is evidenced by only two respondents citing burr oak (*Quercus macrocarpa*) as one of their top five species, which constituted, on average, over 50 percent of their log sales. These log species trends are similar to trends in lumber production for major species. According to recent studies, red and white oak are two of the major species sold domestically and abroad (Buehlmann et al. 2011, Espinoza et al. 2011, Luppold and Bumgardner 2013). In addition, a recent study conducted by the AHMI (2011) found that red oak, white oak, and walnut were three of the top five species used by manufacturers at the High Point Furniture Market.

Respondents also were given a predetermined list of log grades (veneer, prime, intermediate, lower, and other) and asked to indicate the percentage of each grade purchased.

[1] Because 2007 log volumes were not obtained, volumes reported for 2011 log purchases were applied to 2007 log source data to obtain volume-based estimates for 2007.

Table 1.—Log sources reported by log brokers/wholesalers for 2007 and 2010 and calculated volume-based distribution of log sources with year-over-year change for each.

Source	Mean response (%)		Difference in mean response, 2010 vs. 2007 (%)	Volume based (%)		Difference in volume by source, 2010 vs. 2007 (%)
	2007	2010		2007	2010	
Gatewood from loggers	25.8	20.2	−21.7	28.9	26.5	−8.3
Gatewood from landowners	24.0	22.9	−4.6	11.2	8.7	−22.3
Stumpage	31.2	31.1	−0.3	41.1	40.7	−1.0
Other yards/mills	11.4	14.8	29.8	10.8	14.2	31.5
Company-owned timberland	4.2	5.3	26.2	3.4	4.5	32.4
Other brokers	2.9	3.1	6.9	4.2	4.9	16.7
Other	2.4	2.3	−4.2	0.4	0.4	0.0

On average, 29 percent of respondents indicated they purchased intermediate grades, followed by prime grades (27%), veneer grades (24%), lower grades (20%), and other (1%). Log brokers have traditionally been associated with trade in the highest grades, prime and veneer logs, but two of the state experts interviewed at the outset of this study indicated that wholesale log trade through brokers of lower grade ''energy wood'' is now being seen on a more frequent basis.

Market distribution

The state of flux that has engulfed the US hardwood industry over the last decade suggests that shifts in markets for hardwood logs might show up in a comparison between 2007 and 2011. Respondents were asked questions to determine the principal market segments and countries/regions to which they sold logs. Four predetermined market segments were provided: veneer, sawmill, export, and other; respondents were asked to indicate for 2007 and 2011 the percentage of the company's logs that went into each of these four markets. Respondents' log sales to export markets grew by 30 percent from 2007 to 2011. While the volume of export sales increased, veneer (–7%) and sawmill (–6%) sales declined, and the ''other'' segment remained steady (Fig. 3). With the collapse of the housing market and the economic downturn, it is not unexpected that log sales to veneer plants and sawmills declined between 2007 and 2011. Woodall et al. (2012) documented that there were 17 percent fewer sawmills processing 26 percent less wood by the end of 2009 as compared with 2000.

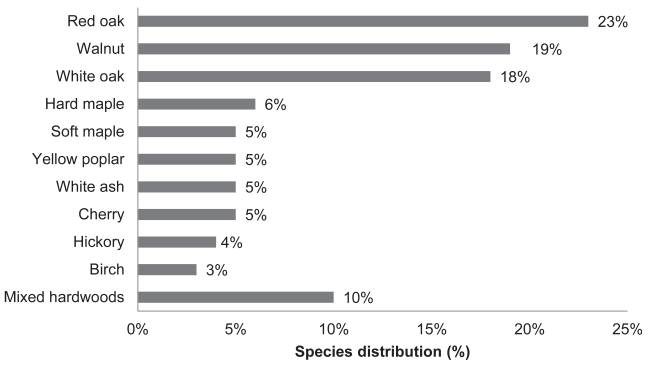

*Figure 2.—Species distribution for typical respondent in 2011 (board foot basis). Others include gum (*Nyssa sylvatica*), elm (*Ulmus *sp.), and unspecified species.*

When respondents were asked to indicate their export markets from a list of six predetermined countries/regions, 61 percent indicated that their company sold to export markets. Of the brokers/wholesalers that indicated they exported logs, the mean percentage of exports going to Asia reported by these companies was 62 percent of all exports. Following Asia, Europe and Canada were named as markets for log exports, with the mean reported export proportions for these markets being 21 and 14 percent, respectively. When these reported export proportions are weighted for each company by factoring in company log sales volumes and their reported export versus domestic sales activity, the percentage of total log sales volume destined for Asian markets is 15 percent. Volume-weighted responses indicate that 5 percent of the logs sold by brokers go to Canadian buyers and 3 percent go to European markets. According to Luppold and Bumgardner (2013), exports have become a major market for hardwood products. From 1990 to 2011, the volume of hardwood logs exported increased by 62 percent, with Canada, China, and Vietnam being top markets for US log exports (Luppold and Bumgardner 2013).

COC certification

Chain-of-custody (COC) certification has been an issue of increasing importance for the hardwood industry over the past decade. However, the cost and complexity of the various certification systems have been a point of contention for many companies in the hardwood supply chain. Respondents were asked a series of questions related to certification. Twenty-three percent (13 of 57) of the responding log brokers reported being COC certified. Of those respondents with COC certification, 92 percent had Forest Stewardship Council certification and 8 percent had Sustainable Forestry Initiative certification. These findings are consistent with other research on certification trends (Montague 2011).

COC certified respondents reported that, on average, 16 percent of the logs they purchased were from certified sources, but only 7 percent were sold as certified. To be considered COC certified all entities in the supply chain must have certification. If a broker sells to a sawmill or other entity that is not certified, the product is no longer considered certified. This is likely the reason that only 7 percent of the 16 percent of certified logs were sold as certified. On a volume-weighted basis, 6 percent of the total log volume brokered by all survey respondents was purchased as certified logs, but only 1 percent was subsequently sold as certified. When asked to address the

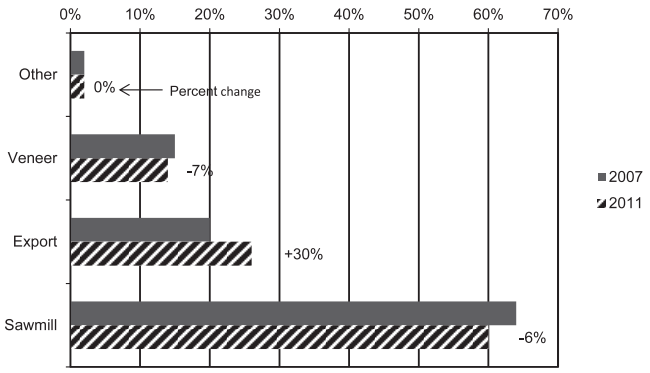

Figure 3.—Percentage of logs going into different market segments for respondents in 2007 and 2011 (board foot basis) and percent change.

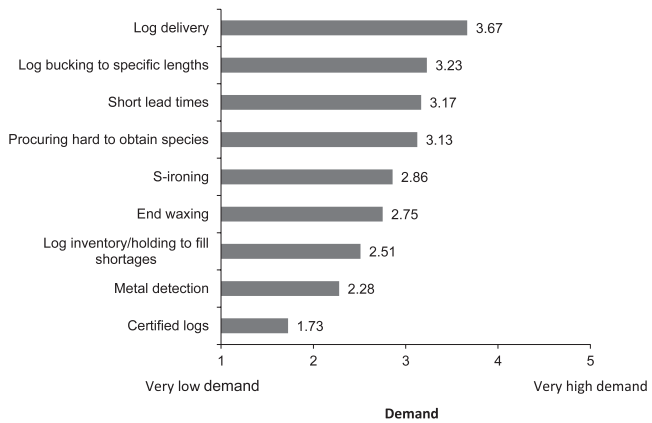

Figure 4.—Demand of services offered by respondents to log buyers (scale anchors: 1 = very low demand, 5 = very high demand).

issue of certified log availability, the majority of the certified respondents (69%) indicated that certified logs were readily available. Although the availability of certified resources has been one of the concerns voiced about COC certification by the hardwood industry (Barrett 2008, 2009), research has indicated that hardwood manufacturers do not perceive this shortage (Montague 2011).

Services offered by log suppliers

To understand the types of services offered by distributors and demanded by customers, respondents were asked a series of questions related to services. On a predetermined list of nine services, distributors were asked ''Please indicate the services you provide to your customers and indicate the demand for the service.'' Respondents were asked to circle the services provided and rate their demand on a 5-point scale anchored by ''very low demand'' and ''very high demand.'' Figure 4 shows the average demand rating of the services provided.

Log delivery was indicated as the highest demanded service (mean = 3.67). Log bucking to specific lengths was rated as second highest in demand (3.23), although a mere 30 percent of respondents indicated they provided that service (Fig. 4). Providing short lead times (3.17) and procuring hard-to-obtain species (3.13) were ranked third and fourth, respectively. Although procuring hard-to-obtain species was ranked only fourth in demand, a majority of respondents (70%) indicated their company offered this service, and almost 30 percent of all logs sold by respondents were sold as specialty logs. When asked about certification, only 23 percent of the respondents indicated their company provided certified logs to their customers. Consequently, this service was rated the lowest service (1.73).

Although log inventory/holding to fill shortages (2.5; Fig. 4) was ranked among the lowest three demanded services, timely and efficient delivery of logs can greatly impact the competitiveness of hardwood products manufacturers. Inefficient trucking and delivery often increases logging costs, resulting in decreased profit margins (Siry et al. 2006). Additionally, log bucking is another service that will greatly impact profit margins. Poor bucking decisions lead to value losses, which are ultimately the concern of landowners, primary processors, and loggers alike (Pickens et al. 1992). Studies on hardwood bucking practices have revealed value loss from inefficient bucking ranged from 21 to 55 percent (Pickens et al. 1992, Haynes and Visser 2004). Further studies showed increased potential to improve value recovery of hardwood logs through improved bucking practices (Wang et al. 2007). The possibility of increased value alone would be a reason for lumber manufacturers to demand the service of experienced log buckers making and carrying out log bucking decisions in the more hospitable environment found in a log yard as compared with in the woods or at the log landing.

Perceptions of log brokers/wholesalers on key business influences

Nine statements were presented to respondents related to company, customer, and environmental influences that, taken together, shed light on current concerns and potential future strategies that can be employed to address prevailing influences. On a scale of 1 (strongly disagree) to 5 (strongly agree), respondents most strongly agreed (mean = 4.0) with the statement ''our company purchases logs on a consistent basis.'' Six other statements elicited responses that indicated, on average, some level of agreement. ''The availability of log supply is a concern for our company'' (mean = 3.98), ''our company provides a stable market for loggers'' (mean = 3.89), ''our company is very selective in purchasing logs'' (mean = 3.68), ''our customers expect short lead times'' (mean = 3.63), ''our customers expect high flexibility in order volumes'' (mean = 3.60), and ''cash flow has been a concern for our company'' (mean = 3.33) were perceived, overall, to be statements with some degree of validity.

In contrast, the mean scores for the two remaining statements were below 3.0, indicating disagreement. These statements were ''prices we pay for logs have increased substantially in the past years'' (mean = 2.60) and ''our company buys/resells imported logs extensively'' (mean = 1.88).

Factors affecting the hardwood log distribution business

Respondents were asked to rate 16 factors related to raw material procurement and transportation and storage that might currently be affecting their hardwood log distribution business on a 5-point scale anchored by 1 (major negative effect) and 5 (major positive effect). Average ratings for this

question are shown in Figure 5. Respondents indicated that increasing log exports had the most positive effect on the hardwood log distribution business (mean = 3.58), followed by the availability of certified logs (2.98) and local wood bioenergy markets (2.95). However, in contrast, increasing fuel and trucking costs were rated as the factor that had the most negative effect on the hardwood log distribution business (1.65), followed by shortage of loggers (2.11) and shortage of log trucks and drivers (both rated 2.37). All of the remaining factors received ratings between 2.50 and 2.80.

Respondents also were asked to list three factors that most strongly influenced log procurement decisions/strategies. Raw material prices (42%), transportation distance and cost (40%), and uncertain factors (28%) were the top three factors listed. Availability of raw material, demand, unavailability of quality grades, seasonality/weather, international purchasing trends, lack of qualified loggers, regulations, and profitability were other factors listed.

Future of the hardwood log distribution business

Respondents were asked ''How do you feel the log distribution will change in the next five years?'' Responses to this open-ended question were categorized as follows: stagnant domestic market (7), increased export market (7), increased log demand (7), decrease of available loggers (4), increased demand for lower quality logs (3), greater efficiency (3), and bigger role for distributors (2). Clearly, the opinions expressed about the future of hardwood log distribution are quite varied.

Summary and Conclusions

Data on the characteristics of US log brokers/wholesalers and strategies adopted to stay in business were collected through phone interviews with eight state marketing and utilization specialists and a mail-based survey conducted in 2012. The 57 respondents to the written survey provided insights into the operations of a segment of the hardwood supply chain that had not been closely evaluated previously.

Hardwood log acquisition by log brokers appears to have become more diversified over the period from 2007 to 2011,

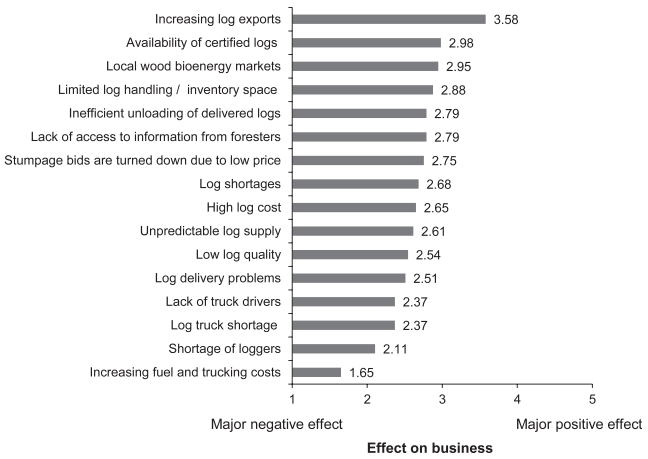

Figure 5.—Factors affecting hardwood log distribution business (scale anchors: 1 = major negative effect, 5 = major positive effect)

with the proportion of logs acquired from gatewood and stumpage still the dominant source of logs, but increases in log acquisition from other log yards, company-owned forests, and other brokers all showing growth. Also, compared with a 4-year-old study on log acquisition by sawmills (Balkentier Consulting 2010), log brokers/wholesalers generally show a greater tendency to purchase logs from other brokers and log yards.

Analysis of species data indicates that white oak and red oak were the most commonly traded species for the responding log brokers, in line with species data reported by others. Black walnut (*Juglans nigra*), which Espinoza et al. (2011) determined made up less than 3 percent of the lumber volume produced and sold by US sawmills and lumber distributors in 2008, was named one of the top-five species by 33 of the 57 respondents, and it made up, on average, 32 percent of total log sales in 2011 for these 33 brokers. Log brokers appear to be very involved in facilitating the acquisition/accumulation of black walnut veneer and prime grade logs for those veneer plants and sawmills that are focused on this species, which was used as one of the top-five species at the High Point Furniture Market in 2011 (AHMI 2011).

Mirroring data and results obtained in other recent studies, survey responses indicated that the sale of hardwood logs to export markets by US log brokers increased by 30 percent from 2007 to 2011. The volume of logs exported to Asian countries represented 15 percent of the total log sales volume for the responding firms in 2011. Two other regions were reported to be significant export markets for logs, with just over 5 percent of log sales made to Canadian firms and 3 percent made to European companies.

COC certification was held by 23 percent of the responding log brokers, and these brokers indicated that just over 16 percent of the volume they purchased was COC certified. The reported volume these certified brokers subsequently were able to sell to certified markets was reported to be about 7 percent of their logs. Based on the overall volume of logs brokered by all responding firms, only 1 percent was sold as certified logs. While the percentage of log brokers who buy and sell certified logs aligns well with the percentage of sawmills that sold certified lumber in 2008 (20%; Espinoza et al. 2011), certified hardwood lumber markets are not yet considered to be an important factor impacting sawmill businesses (Espinoza et al. 2011).

Timely and efficient log delivery is the most important service demanded by veneer and sawlog buyers. Shortened lead times on log deliveries and the provision of log loads of specific, hard-to-obtain species also were noted to be in demand by some respondents. Several experienced and successful log brokers also identified tree-length trucking and yard-based bucking as a substantial opportunity for adding value to their product offerings; part of a differentiation strategy that more log brokers/wholesalers most likely would do well to pursue.

The increasing strength of export markets was the only factor, of the 16 given, rated as having a positive influence on the success of hardwood log distributors. Increasing fuel and trucking costs, logger shortages, and log truck shortages are three factors that have negatively affected the log broker/wholesaler/distributor sector.

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