

# Export Activities of Central Appalachian Hardwood Products Industry: The Case of West Virginia

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## Abstract

The US forest products industry is struggling as it faces increasing pressure from foreign competition coupled with the current slump in the housing market. In order to survive, industries need to maintain and expand their domestic and international markets. Because the forest products industry of West Virginia is an important component of the state's economic base, the industry must explore the export market to expand its market coverage. A mail survey was conducted in 2009 to assess the problems and potential strategies regarding participation of the West Virginia forest products in the export market. Results indicate that 28 percent of the respondents exported abroad. The most common product exported was lumber, followed by logs. The main reason that companies sell abroad is to reduce risk by selling to a diverse market, while the main reason for not exporting is the perception that domestic market involvement is sufficient. As expected, exporters were relatively more knowledgeable about issues related to exporting compared with nonexporters, and they were also more knowledgeable in strategies needed to conduct international business. Based on the indicators examined, exporters were also more innovative. Of the respondents who did not participate in the export market, only 44 percent indicated that they were interested in developing export markets for their products. The top three problems that hindered competitiveness among nonexporters were production costs, lack of capital, and raw material problems.

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The success of any economy is increasingly dependent on maintaining and expanding domestic and international markets. However, the US forest products industry is struggling as it faces increasing pressure from foreign competition. Foreign manufacturers have a significant advantage in labor costs, and in some cases their competitive advantage includes more favorable material costs and access to capital (Howe et al. 2005). Global wood market trends are significantly affecting the US forest products industry. For example, China's gain in the US furniture market alone reduced domestic hardwood lumber consumption by over 20 percent (Howe et al. 2005). Along with these changes in global wood markets, the current slump in the US housing market is also taking its toll on the forest products industry.

There is an increasing concern among companies in the wood industry regarding trends in importation of wood products. Bumgardner et al. (2004) examined industry perspectives regarding trends in domestic wood manufacturing and importing and went on to identify factors that might enhance domestic competitiveness in the secondary hardwood industries in the United States. Their findings suggested that quality, timeliness, innovation, and design were important factors that affect domestic competitiveness of the US secondary wood industries. Most firms have

looked to the global marketplace to improve their competitiveness (Agnihotri and Santhanam 2003). According to Dickerson and Stevens (1998), exporting offers opportunities to expand market shares and increase sales, to serve as an outlet for inventory, and to reduce risk through diversification strategy. Active hardwood products exporters are more internationally oriented in marketing scope, use a variety of sales elements, seek to increase the use of multiple sales channels, and have higher self-rated levels of knowledge concerning international business elements. Innovation is also important in creating a competitive advantage in wood-using industries (Valimaki et al. 2004). Other strategies that are recommended to achieve success in the global marketplace are the ability (1) to anticipate and implement solutions to customer wants and needs that are not yet obvious; (2) to recognize that people and not equipment are the most critical resource and that training,

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empowerment, diversity, and creativity are essentials; and (3) to identify new leadership with the ability to hire, train, retain, and share leadership with a high performing group of diversely skilled individuals (Howe et al. 2005).

Hardwood resources and the manufacturing supply and value chains associated with these resources are a major component of West Virginia's economic base. Hence, strategies that support competitive advantages in the domestic and global marketplace are of particular interest to the forest products industry in the state. Approximately 78 percent (12.0 million acres) of West Virginia is forested, and hardwoods make up over 90 percent of this forest cover (Griffith and Widmann 2003). The contribution of the wood industry to West Virginia's economy has been increasing since the 1980s. The forest industry created 30,000 jobs and generated a total industry output of \$4 billion in 2005 (Childs 2005). Approximately 91 percent of the state's production in the logging sector and 99 percent of the lumber production in the sawmill sector use native hardwoods (Greenstreet and Cardwell 1997), substantiating the role of West Virginia as a major producer of hardwood. Given their importance to the state's economy, hardwood manufacturers need to respond to the current and growing threats from both domestic and, more importantly, global competition. Increasing integration of international markets combined with growing worldwide competition necessitates adoption of global perspectives in planning marketing strategies (Agnihotri and Santhanam 2003). As suggested by Dickerson and Stevens (1998), export marketing can be one tool to improve global competitiveness. West Virginia's wood products sector is one of the top 10 exporters in the state, bringing in a total of \$69 million in value in 2009 (US Commercial Service 2009); however, a recent industry survey conducted by Arano (2008) showed that only 20 percent of the primary and secondary hardwood companies surveyed in West Virginia were involved in the export market. This low percentage of forest product exporters suggests an opportunity for the state's wood industry to increase its share in the global marketplace by expanding its export activities. This becomes even more important because export value of the wood products sector in the state experienced a 28 percent decline from the previous year (US Commercial Service 2009).

When a firm prepares to export its products to foreign markets, there is a wide array of organizational and marketing elements it must consider (Dickerson and Stevens 1998). Information concerning aspects associated with international marketing practices has not been examined in West Virginia's hardwood industry. In addition, while anecdotal evidence suggests that the state's wood industry is taking a hard hit with the combination of an unprecedented level of both domestic and global competition and a housing slump, there is a need to closely examine these companies to assess the specific problems and issues they are facing. Such information is necessary to develop strategies that will help the industry survive the current economic crisis it is facing. This article therefore examines export activities of the West Virginia forest products industry. It provides baseline information regarding export market involvement and characterizes both the exporting and nonexporting firms in West Virginia.

## Methodology

A mail survey was conducted to collect information regarding the major factors that could affect global

competitiveness of the forest products industry in West Virginia. The survey was based on the theoretical constructs of Yip et al. (1988) and Valimaki et al. (2004). According to Yip et al. (1988), an industry potential for global competitiveness is driven by a combination of market (e.g., global customers), economic (e.g., costs), environmental (e.g., policies, technology), and competitive (e.g., county interdependence) factors. Valimaki et al. (2004) identified both input indicators (e.g., cooperation with expert agencies and investment of money and manpower to technology and research) and output indicators (number of products, number of product improvements, percentage of product that is new, number of new production methods) as measures of firm innovativeness, which in turn influence the firm's competitiveness. In addition, the survey included questions from constructs and measures used by previous studies (e.g., Dickerson and Stevens 1998, Bumgardner et al. 2004). For example, the survey also collected information on industry characteristics (e.g., type, size), export marketing characteristics (e.g., management motivation for exporting, product readiness for foreign markets, knowledge of international business elements, experience and training of management), export/import activities, and products and production.

The participants in the survey included both primary and secondary hardwood industries in West Virginia. Names and addresses of industries were obtained from the Forest Industry Database maintained by the Appalachian Hardwood Center (AHC). Dillman's (2000) Tailor Design Method was used in developing and administering the mail survey. Three mailings were sent to the potential survey respondents to ensure a high response rate: the initial mailing of the survey instrument, a follow-up mailing (3 to 4 wk after the initial mailing), and a final mailing to nonrespondents (3 to 4 wk after the follow-up). Creating a dichotomy between exporters and nonexporters is one of the approaches used by previous studies (e.g., Cavusgil and Nevin 1981, Burton and Schlegelmilch 1987) to measure export performance of industries.  $\chi^2$  tests and *t* tests were conducted to differentiate between exporters and nonexporters.

## Results

### Survey results

Of the 394 surveys sent out, 94 usable responses were received. This resulted in a 32 percent response rate after adjusting for undeliverable addresses and for businesses that had closed. Approximately 26 firms were found to have closed. To address the possibility of a nonresponse bias, the distribution of early respondents was compared with the distribution of late respondents based on two demographic variables (i.e., firm size and years in business) using the Kolmogorov-Smirnov test (K-S test). The basic assumption is that late respondents are a proxy for nonrespondents (Lin and Schaeffer 1995). Results of the K-S tests indicate that the distribution of the early respondents with respect to firm size (K-S statistic = 0.17) and firm age (K-S statistic = 0.14) was not statistically different from that of the late respondents.

### Exporters and nonexporters

Based on the survey results, approximately 28 percent of the respondents were exporters, and the majority (72%) of respondents were nonexporters. West Virginia forest

products firms exported their products to different regions of the world (Fig. 1). Specifically, forest products from West Virginia were being exported to China, Japan, Vietnam, Australia, Brazil, South Africa, Turkey, and other European countries like Ireland, the United Kingdom, Italy, and Germany. About 37.5 percent of exporters shipped their products to China. Lumber (38%) was the most common product exported, followed by logs (24%). Other products exported included veneer, dimension, millwork, wood components, pulp, and paper. Of the firms that exported, export revenues accounted for about 8.4 percent of their gross in 2009. Exporting firms were also engaged in activities intended to promote the company to foreign customers. For example, in terms of catering to customer needs, 52 percent of the exporters offered some type of after-sales support to their foreign customers, and a majority (84%) provided a follow-up call to those customers about their orders. Most of the firms (88%) were also able to modify products and/or packaging to suit customer needs. The most important reason cited by exporters for selling to international markets was to reduce their risk by diversifying their customer base (Fig. 2). Exporters also indicated that they engage in the international market as part of their long-term expansion plan.

With regard to nonexporters, most (56%) of them had no plans of expanding their business to the international market. The two main reasons for this were the perception that the domestic market was sufficient and the perception that they were already at a strategic disadvantage.

### Demographic variables as indicators/factors of competitiveness

A number of demographic variables were collected from the survey and compared between exporters and nonexporters. In terms of firm size, exporters were likely to have

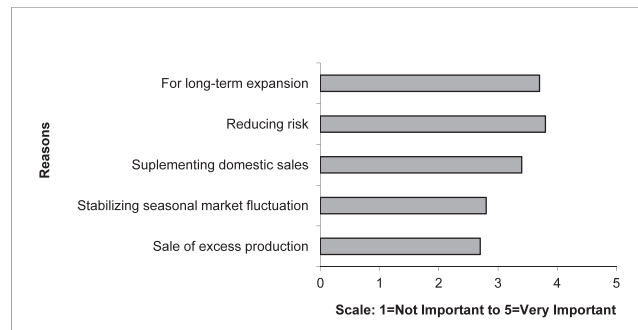


Figure 2.—Exporters' reasons for selling to international markets.

more employees than nonexporters (Fig. 3). Exporters also tended to have higher revenue compared with nonexporters (Fig. 4). Results of the  $\chi^2$  tests regarding the distribution of exporters and nonexporters with respect to these demographic variables were statistically significant.

### Other indicators/factors of competitiveness

Respondents were asked about their level of knowledge on six issues related to exporting and, as expected, exporters were more knowledgeable on all issues (Table 1). Nonexporters had relatively very little knowledge on the issues identified. This may be problematic because even those who do not export should be aware of these international issues because they may have an affect on the domestic market as well. With regard to the level of experience in areas needed to conduct international business, exporters were again relatively more experienced than nonexporters, but not in the upper spectrum of the Likert scale (Table 2). Foreign language competency is an

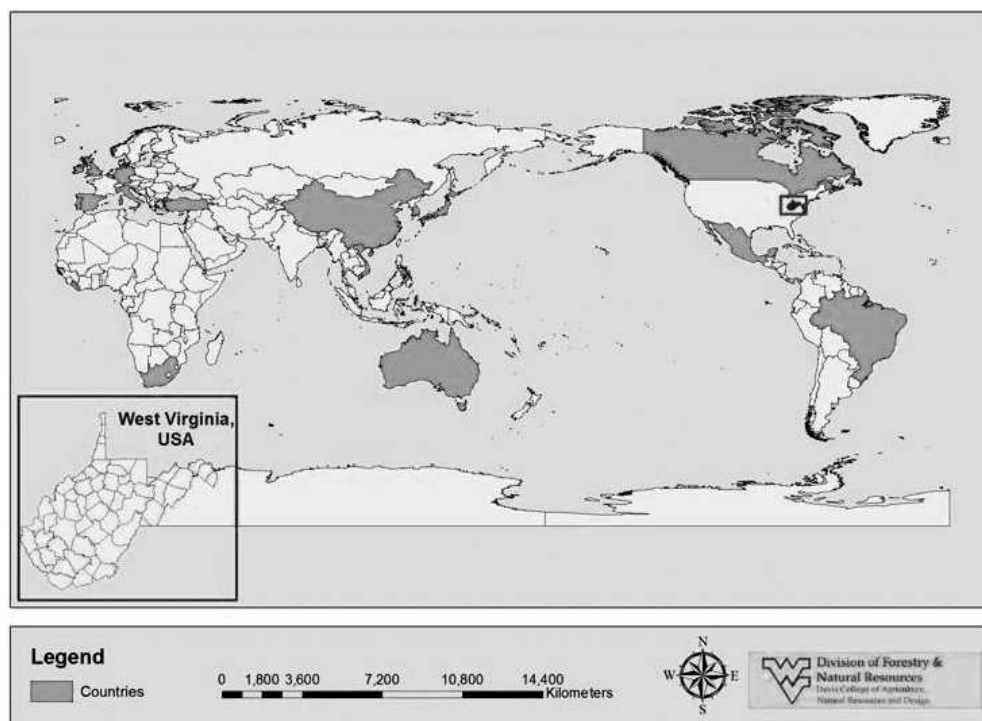


Figure 1.—Export activities of West Virginia forest products industries.

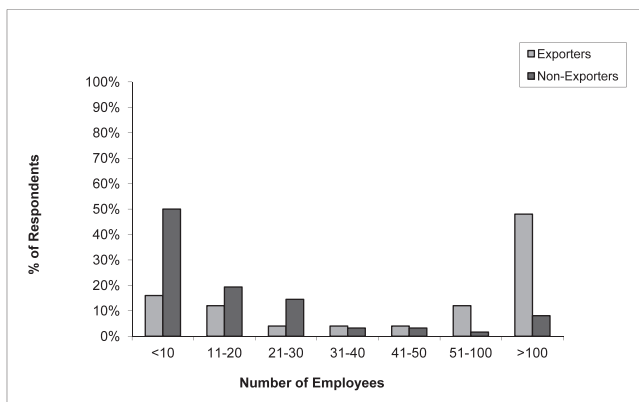


Figure 3.—Distribution of exporters and nonexporters by number of employees ( $\chi^2 = 26.2$ ;  $P = 0.00021$ ).

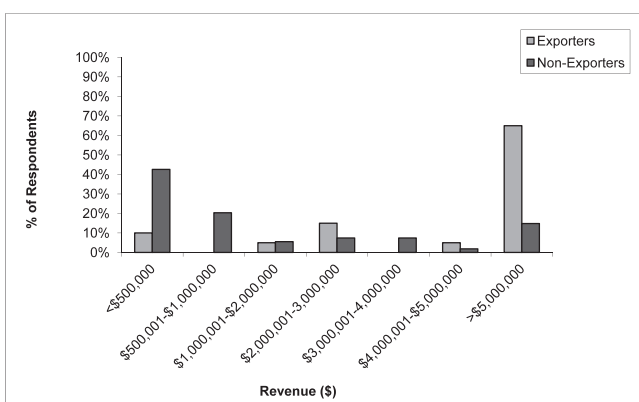


Figure 4.—Distribution of exporters and nonexporters by gross sales revenue in 2009 ( $\chi^2 = 24.5$ ;  $P = 0.000$ ).

area where both exporters and nonexporters had relatively low experience, although exporters still indicated a greater level of experience than did nonexporters.

Respondents were asked to rate a number of marketing variables related to competitiveness. These marketing variables were adopted from the Center for International Trade in Forest Products (CINTRAFOR 1999). The variables were grouped into six categories: firm reputation, efficient production, product differentiation, distribution, market activities, and forest ownership. The results indicate that both exporters and nonexporters place a high level of

Table 1.—Level of knowledge of respondents on issues related to exporting.

| Exporting issues                      | Mean <sup>a</sup> |              |
|---------------------------------------|-------------------|--------------|
|                                       | Exporters         | Nonexporters |
| Foreign market costs                  | 3.7 A             | 1.5 B        |
| Tariffs and nontariffs trade barriers | 3.7 A             | 1.4 B        |
| Foreign competition                   | 3.8 A             | 1.6 B        |
| Legal systems                         | 3.4 A             | 1.5 B        |
| Foreign currencies                    | 3.9 A             | 1.4 B        |
| Export market information sources     | 3.7 A             | 1.5 B        |

<sup>a</sup> Values are based on the following scale: 1 = not knowledgeable to 5 = very knowledgeable. Within a row, means with different letters are significantly different at the 5 percent level.

Table 2.—Level of experience of respondents on areas needed to conduct international business.

| International business knowledge        | Mean <sup>a</sup> |              |
|---|-------------------|--------------|
|   | Exporters         | Nonexporters |
| Training in cross-cultural negotiations | 2.6 A             | 1.4 B        |
| Foreign language competency             | 2.4 A             | 1.3 B        |
| Attending export seminars               | 2.6 A             | 1.4 B        |
| Participating in trade shows            | 3.4 A             | 1.9 B        |
| Using government/information services   | 2.9 A             | 1.7 B        |
| Belonging to trade organizations        | 3.3 A             | 2.2 B        |

<sup>a</sup> Values are based on the following scale: 1 = no experience to 5 = very experienced. Within a row, means with different letters are significantly different at the 5 percent level.

importance on variables that pertain to the reputation of the firm, namely, maintaining regular customer contact, quality control, and on-time delivery of products and services (Table 3). There were no statistically significant differences between exporters and nonexporters in terms of how these marketing variables were rated except for the market research variable.

The degree of firm innovativeness was also evaluated in the study. Innovation was characterized by questions related to the number of products and product improvements. Exporters were relatively more innovative than nonexporters in terms of the number of products produced in a given year and the proportion of a firm's total products that are new in a given year (Table 4). Input indicators for innovativeness were also evaluated and compared between exporters and nonexporters (Table 5). These included cooperation with expert agencies, investment of money

Table 3.—Importance of marketing variables to competitiveness.

| Marketing variable         | Mean <sup>a</sup> |              |
|----------------------------|-------------------|--------------|
|                            | Exporters         | Nonexporters |
| Firm reputation            |                   |              |
| On-time delivery           | 4.6 A             | 4.3 A        |
| Quality control            | 4.8 A             | 4.2 A        |
| Regular customer contact   | 4.5 A             | 4.1 A        |
| Efficient production       |                   |              |
| Raw material availability  | 4.3 A             | 4.1 A        |
| New equipment              | 2.7 A             | 2.9 A        |
| Employ experienced workers | 3.7 A             | 3.6 A        |
| Product differentiation    |                   |              |
| Offer specialty products   | 2.7 A             | 2.9 A        |
| New product development    | 2.8 A             | 2.6 A        |
| Distribution               |                   |              |
| Serve market niches        | 3.0 A             | 3.4 A        |
| Competitive pricing        | 4.3 A             | 3.7 A        |
| Marketing activities       |                   |              |
| Use new marketing methods  | 2.9 A             | 2.9 A        |
| Conduct market research    | 3.1 A             | 2.2 B        |
| Promotion and advertising  | 3.4 A             | 2.8 A        |
| Forest ownership           | 2.6 A             | 2.2 A        |

<sup>a</sup> Values are based on the following scale: 1 = not important to 5 = very important. Within a row, means with different letters are significantly different at the 5 percent level.

Table 4.—Firm innovativeness using output indicators.

| Output indicator               | Mean <sup>a</sup> |              |
|--------------------------------|-------------------|--------------|
|                                | Exporters         | Nonexporters |
| No. of products                | 6.6 A             | 1.7 B        |
| No. of product improvements    | 2.4 A             | 1.6 A        |
| % of total product that is new | 8.6 A             | 3.9 B        |
| No. of new production methods  | 2.4 A             | 1.6 A        |

<sup>a</sup> Within a row, means with different letters are significantly different at the 5 percent level.

and manpower to technology and research, and international activities. In terms of cooperating with educational, research, and expert organizations, exporters were more likely to cooperate with these organizations compared with nonexporters. Expert organizations provide avenues for learning about new trends and development in the industry, and about new products and opportunities in the market. Exporters were more likely to allocate a higher proportion of manpower for expanding international activities compared with nonexporters, indicating a commitment toward their participation in the export market. Exporters tended to invest a higher proportion of the firm’s revenue in new technology. Over 50 percent of exporters and nonexporters thought their company was somewhat successful in introducing new technology.

### Problem areas and assistance needed

Survey respondents were also asked to identify the impediments to competitiveness and workforce training needs. The top three impediments to competitiveness that exporters identified included volatility of product pricing, excess capacity, and raw material problems. For the nonexporters, the main problems identified included productions costs, lack of capital, and raw material problems. Respondents were also asked about their training needs to remain competitive. Exporters had a greater desire than nonexporters to be trained in areas of workforce skills, cost reduction, management, international marketing, and product development (Table 6).

Table 5.—Firm innovativeness using input indicators.

| Input indicator                                    | % of respondents <sup>a</sup> |              |
|--|-------------------------------|--------------|
|  | Exporters                     | Nonexporters |
| Cooperation with research and expert organizations |                               |              |
| Yes  | 74                            | 44           |
| No   | 26                            | 56           |
| Manpower allocated toward international activities |                               |              |
| Occasional   | 33                            | 91           |
| Half-time of 1 person                              | 13                            | 9            |
| Full-time of 1 person                              | 21                            | 0            |
| More than full-time of 1 person                    | 33                            | 0            |
| % of revenues spent on new technology              |                               |              |
| 2  | 36                            | 70           |
| 2–5  | 41                            | 20           |
| 6–10   | 9                             | 7            |
| 1  | 14                            | 4            |

<sup>a</sup> Results of the  $\chi^2$  test comparing exporters and nonexporters regarding input indicators are statistically significant at the 5 percent level.

Table 6.—Training needs of West Virginia forest products firms.

| Training                       | Mean <sup>a</sup> |              |
|--------------------------------|-------------------|--------------|
|                                | Exporters         | Nonexporters |
| Workforce skills training      | 3.3 A             | 2.5 B        |
| Cost reduction                 | 3.9 A             | 3.0 B        |
| Waste minimization             | 3.5 A             | 2.8 A        |
| Quality control                | 3.6 A             | 2.8 A        |
| Management training            | 3.2 A             | 2.4 B        |
| Production technology training | 3.1 A             | 2.3 A        |
| Computer training              | 3.3 A             | 2.6 A        |
| Domestic marketing             | 3.1 A             | 2.7 A        |
| International marketing        | 3.4 A             | 2.0 B        |
| Inventory control              | 2.8 A             | 2.3 A        |
| Pollution prevention           | 2.9 A             | 2.4 A        |
| Government regulations         | 2.6 A             | 2.4 A        |
| Product development            | 3.0 A             | 2.1 B        |
| Securing financing             | 2.8 A             | 2.5 A        |

<sup>a</sup> Values are based on the following scale: 1 = not desired to 5 = greatly desired. Within a row, means with different letters are significantly different at the 5 percent level.

Both exporters and nonexporters considered cost reduction, quality control, and waste minimization as top priorities for training assistance. This indicates a greater commitment of the exporters to do well in the business, even though several of the indicators examined in this study showed they fare well compared with the nonexporters.

### Discussion and Conclusions

The advent of globalization has pushed business firms to participate in the global marketplace. With the downturn of the economy and increasing global competition, the US forest products industry has suffered tremendously in the past few years. Increasing participation in the export market offers an opportunity for the industry to expand its market share. However, firms are facing challenges regarding the most appropriate strategies to participate in the global market (Agnihotri and Santhanam 2003). This study of West Virginia forest products firms indicates that a majority (72%) of the forest products firms surveyed in West Virginia are nonexporters. Hammett et al. (2009) also observed the same trend among the southern Appalachian states. These observations suggest that there is a significant degree of dormant export potential among forest products firms in the United States, and specifically in West Virginia. The study shows that most nonexporters in West Virginia do not have plans to venture into the world of international business. Results from this study therefore provide insights on how these companies might be encouraged to participate in the international market.

In terms of forest products firms’ demographic variables, exporting firms were larger and have higher revenues. Previous studies (e.g., Delgado et al. 2002, Pöschl et al. 2009) have shown that exporting firms tend to be larger in terms of output and employment and they are also superior to nonexporting firms in performance measures such as labor productivity, total factor productivity, and capital intensity. The results of this study indicate the need for education and training among West Virginia nonexporters. Training that might benefit these firms is related to general exporting strategies and methods and skills used in conducting international business (e.g., foreign language

competency, cross-cultural negotiations). Addressing these needs is an important step to stimulate nonexporters' interest and understanding of the export market. While exporters were relatively more experienced than nonexporters, their experience level was in the lower end of the spectrum (2.4 to 3.3 in a 1 to 5 Likert scale), suggesting an opportunity to improve the performance of exporting firms. One of the determinants of export performance is marketing strategy (Brodrechtova 2007). This study also examined how exporters and nonexporters perceived a number of marketing variables with respect to their importance to firm competitiveness. Both exporters and nonexporters put a high level of importance on marketing variables related to firm reputation and put low importance on variables related to product differentiation. Product differentiation can also help firms participate in the export market. Active exporters tend to follow a more consistent competitive strategy based on product differentiation (Gomez and Valenzuela 2006). This is therefore one area where West Virginia forest products firms should pay closer attention to improve export performance. Firm innovativeness plays a key role in the ability of a company to participate in the global marketplace. Innovativeness is an integral part of a company's increased internationality and profitability (Valimaki et al. 2004). Nonexporters in West Virginia that are interested in participating in the export market should explore introducing new products to the marketplace, continue to make improvements on existing products, cooperate with research and expert organizations, increase manpower allocation toward international activities, and increase spending on new technology. Exporters, on the other hand, will benefit from improving their spending allocation on new technology. The results show that most exporters allocate less than 10 percent of their total revenue on new technology, while foreign competitors (e.g., China) are spending significantly more (Howe et al. 2005).

West Virginia exporters are taking advantage of the growing forest products demand in China. About a third of exporters in West Virginia have tapped the Chinese market. While the United States is known to be the largest supplier of hardwood forest products to China, a recent study by Wang et al. (2010) showed that the majority of these products are being imported from the Appalachian region. Forest products trade with China will continue to increase with its rapidly growing economy. As of 2011, China's real growth rate was still at 9.2 percent (Central Intelligence Agency 2012). According to a recent report by the Food and Agriculture Organization of the United Nations (FAO 2011), China is the largest importer of industrial roundwood, sawnwood, pulp, and wastepaper. These trends could provide a great opportunity for other exporters to expand and for nonexporters to convert and to tap into the international market.

While this article provides baseline information regarding export involvement of the West Virginia forest products firms and differentiates between the characteristics of exporters and nonexporters, future research should empirically examine whether involvement in the export market will indeed make a firm more profitable and more competitive.

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