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A Brief History of the Trade of Forest Products from Washington State

prepared by Ivan Eastin, CINTRAFOR Director

Washington's forest products industry has enjoyed a long history of trade with Asia. However, in the 1990s, the combination of a strong dollar and rising housing starts caused many exporters to lose their focus on Asian markets. More recently, in response to the weakening dollar and the rapid decline of the housing market, we've seen renewed forest products industry interest in Asian markets. In 2005, forest products exports from WA represented almost 20% of total US forest products exports and generated just under $1.2 billion in export revenues. But some exporters have lost touch with the markets and their customers, and are finding it a challenge to reestablish a presence in their traditional Asian markets. The events of the last twenty years underscore the fact that markets tend to be cyclical and that it is important for exporters to maintain their business relationships even though a downturn in a business cycle might indicate otherwise.

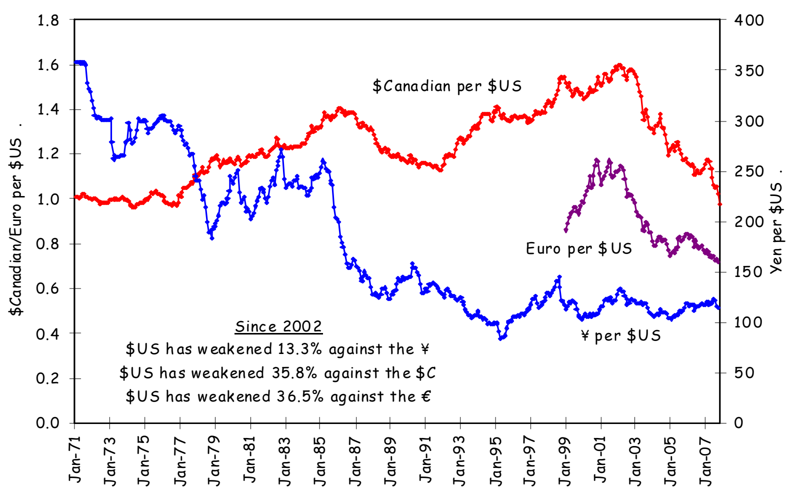

Figure 1. The US dollar has been weakening against both the Canadian dollar and the European euro.

Washington's trade relationship with Asian countries really took off following the Columbus Day storm on October 12, 1962 that blew down 17 billion board feet of timber, a volume which far exceeded the processing capacity of regional sawmills. The Washington DNR, needing to salvage this immense amount of wood before it rotted, contracted with a Japanese firm to salvage "raw logs" from state-owned lands, which triggered a long and bitter debate over the export of state timber. In 1966, approximately 350 million board feet of timber was exported to Japan. This increase in exports occurred as Japan housing starts were rising as they rebuilt their infrastructure following many years of post-war depression. Much of this salvage wood was from old-growth forests, and the Japanese quickly developed an appreciation for tight grain high quality DF wood that continues today. At the same time, export markets were developing in Taiwan and Korea for lower quality wood, and the export market from Washington state was in full swing, although with a strong emphasis on raw logs.

Log exports from Washington continued to increase as a sector of the Japanese sawmill industry began specializing in the production of metric sized lumber from imported Douglas-fir logs for use in the construction of Japanese post and beam homes. Washington sawmills soon began to produce and export metric lumber to supply posts (hashira) and beams (hirakaku) for the post and beam industry in Japan as well. Primary wood product exports from Washington continued to increase as the Japanese economy experienced tremendous growth throughout the 1965 to 1995 period, which culminated in the infamous Bubble Era. Primary forest products exports from WA state increased rapidly during this period and hit $3.2 billion in 1989. To a large degree, this success was a reflection of Japanese customer's willingness to pay a substantial price premium for high quality old-growth Douglas-fir logs and lumber; prices that were well in excess of domestic market prices.

The listing of the spotted owl as an endangered species in 1989 led to a rapid decline of log exports as the export of logs harvested from state forests was banned. (Log exports from federal forests had already been banned in 1968.) By the mid-1990's, WA exports of commodity

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Director's Notes

Shifting Comparative Advantage Provides Opportunities for US Wood Exports

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The Center for International Trade in Forest Products addresses opportunities and problems related to the international trade of wood and fiber products. Emphasizing forest economics and policy impacts, international marketing, technology developments, and value-added forest products, CINTRAFOR's work results in a variety of publications, professional gatherings, and consultations with public policymakers, industry representatives, and community members.

Located in the Pacific Northwest, CINTRAFOR is administered through the College of Forest Resources at the University of Washington under the guidance of an Executive Board representing both large and small companies, agencies, and academics. It is supported by state, federal, and private grants. The Center's interdisciplinary research is carried out by university faculty and graduate students, internal staff, and through cooperative arrangements with professional groups and individuals.

Throughout history industries have moved from one country to another on the basis of comparative advantage. The ongoing shifting and relocation of the textile and automobile industries is a good example. While economists (seemingly endlessly) debate the factors that provide a country with a comparative advantage in the production and trade of a product, the net effect of this process is often the decline of a mature manufacturing industry in a developed country and the emergence of a new industry in a developing country. Understanding the factors that provide a country with a comparative advantage in a specific industry is important in understanding the international movement of industries. Take for example, the US wooden furniture and flooring industries. Historically these industries were based in the US as a result of a number of favorable conditions, including: furniture designs that were unique and traditional to the US, the high costs and damage rates for transporting bulky furniture over long distances, relatively close proximity to a plentiful and high quality wood resource, the presence of a large and affluent domestic market, a highly skilled and productive labor base and consumer familiarity with, and preference for, domestic wood species.

Unfortunately, the relative importance of many of these factors in determining competitive advantage has diminished and over the past 15 years we have seen the base of furniture and flooring production shift from the US Midwest to the US south to China, and more recently, to Vietnam. Some industry observers suggest that the production of wooden furniture may ultimately shift to India as manufacturers continue pursuing lower cost labor and less restrictive environmental, health and safety regulations. Interestingly, all of these new producer countries has one important characteristic in common…the absence of a domestic wood resource to provide the raw material inputs for their wood manufacturing industries.

The absence of an adequate domestic timber supply in these countries provides US forest products manufacturers with a unique opportunity to supply both hardwood and softwood logs and lumber to manufacturers of wood products in these countries. More importantly, a series of recent market developments have greatly improved the international competitiveness of US forest products exports. First, the US dollar is trading at historically low levels against both the Euro and the Canadian dollar, making US forest products exports very cost competitive. US exports of wood products, which had been declining between 1997 and 2002, increased by almost 12% between 2004 and 2006 and are on a pace to increase by approximately 5% in 2007. Second, the increased attention being paid to illegally harvested timber makes it increasingly important that manufacturers of wood products exported into the US, European, Canadian and Japanese markets be able to demonstrate the legality of their wood raw materials. Already several countries have begun to adopt public procurement policies requiring that wood products used in publicly funded projects be certified as having been manufactured from legally harvested timber. Finally, the log export ban currently being implemented in Russia will continue to constrain global timber supplies and provide further opportunities for US wood products.

While these developments will provide new export opportunities for primary wood products, they are benefiting exports of value-added wood products even more. Between 2003 and 2006, the growth in US exports of value-added wood products actually outstripped that of primary wood products. With the continued contraction of the US housing market, it just makes good business sense for US wood products manufacturers to begin to explore new opportunities in export markets.

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wood products to Asian markets began to decline as the dollar continued to strengthen and rising domestic housing starts caused WA forest products manufacturers to reduce their focus on Asia. This trend was exacerbated by significant changes in the Building Standard Law of Japan that were made following the devastation that was caused in 1995 by the Great Hanshin earthquake. This event was closely followed by the Asian Economic Crisis in 1997 that sent the Japanese economy into a prolonged recession. In response, the Washington forest products industry retreated further from Asian markets and continued to increase its focus on

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domestic markets. As a result, exports of primary wood products from WA declined from almost $3 billion in 1996 to less than $900 million in 2003.

Recognizing the tremendous opportunity for value-added wood products in Asia, CTED, in collaboration with the Evergreen Building Products Association and CINTRAFOR, began a program to expand the export of value-added wood products from WA. This program encouraged the export of value-added wood products by providing manufacturers and building material exporters with market research and export support services. Washington state and CINTRAFOR also began to work with the Japanese government and US forest products industry associations to promote the acceptance of US wood frame construction technology in Japan through a series of projects including Washington Village. As a result, 2x4 construction was accepted in the Japanese building code and 2x4 housing starts increased from only 168 in 1974 to 105,390 in 2006.

As a result of these programs, exports of value-added wood products from WA, which prior to 1989 were less than $100 million, began to grow rapidly and by 1996 had increased to $384 million, a four-fold increase in just seven years. However, the aftermath of the 1997 Asian Economic Crisis, combined with a strong US dollar, quickly undermined the market for value-added wood products in Asia, and by 2002 exports from WA had declined to $174 million.

The emergence of China as a major manufacturer of wood products has provided new opportunities for the WA forest products industry. The lack of an adequate domestic wood resource to supply the rapidly growing wood manufacturing sector in China has forced the Chinese to look outwards for their raw material supply and provided an opportunity for the forest products industry in WA. Responding to this new market, WA exports of forest products to China have more than doubled between 2000 and 2006 to reach $84 million, the majority of which have been primary wood products.

Recently, CINTRAFOR, in collaboration with the Evergreen Building Products Association and CTED, has managed the US-China Build program aimed at expanding US exports of wood products and construction technologies into China. The result of this project have been impressive:

- Over 153 US companies have participated in USCB programs in China, resulting in product sales in excess of $15,000,000.
- 270 Chinese construction professionals have traveled to the US to learn about US building materials and wood frame construction technologies.
- Over 1,930 Chinese construction professionals have attended USCB seminars across China and over 60 US companies have participated as speakers and in the trade shows that accompany the event.

The current international business environment supports the expanded participation of WA forest products manufacturers into Asian markets. The major contributor to this change has been the significant weakening of the US dollar. Since 2002, the US dollar has weakened by 36% against both the Canadian dollar and the Euro and by 13% against the Japanese yen (see figure 1). In response, exports of primary and secondary wood products from WA have increased by 10% and 35%, respectively, since 2003. In addition, several new developments in Asian markets could provide significant impetus to boost forest products exports from WA. For example, a log export ban announced by Russia could provide significant new opportunities in Japan and China where Russian logs represent 34% and 52% of softwood log imports, respectively. Similarly, a new change to the Building Standard Law of Japan requiring architects to take responsibility for the structural integrity of new homes could provide significant impetus to the 2x4 sector of the residential housing industry and yield new export opportunities for WA sawmills. Finally, the rapid development of the wood processing sector in Vietnam has caused raw material shortages in that country and imports of logs and lumber have been increasing rapidly.

Washington State forest products exports, 2003-2006 ($1,000)

	2003	2004	2005	2006	% Change 2003-2006
Primary	$894,733	$1,031,924	$985,323	$986,237	+10.2%
Value-Added	$185,689	$219,537	$238,600	$249,886	+34.6%

My conclusion to you is a two-fold message, based on these developments within the forest products sector and the international marketplace. First, recent developments, led by the weakening of the US dollar, should help to improve the competitiveness of WA forest products exports. Second, international economies and markets tend to be countercyclical to the US economy, providing a hedge against downturns in the domestic market. As WA forest products manufacturers work to regain their place in international markets, it is important to remember that a balanced market portfolio is important in weathering future market declines, both in the domestic market and international markets.

The North American Market for Glued Laminated Lumber: Species Use and Applications

Prepared by: Joe Roos, Ivan Eastin and Daisuke Sasatani

Introduction

Glued laminated timber, often referred to as glulam timber is an engineered stress rated lumber product manufactured by adhesively bonding individual pieces of lumber (referred to as lamstock) having a thickness of 50mm (2 inches) or less. Glulam beams can be produced in a variety of shapes ranging from straight beams to complex curved members and are used for a wide variety of structural applications in both residential and commercial construction (APA 2007).

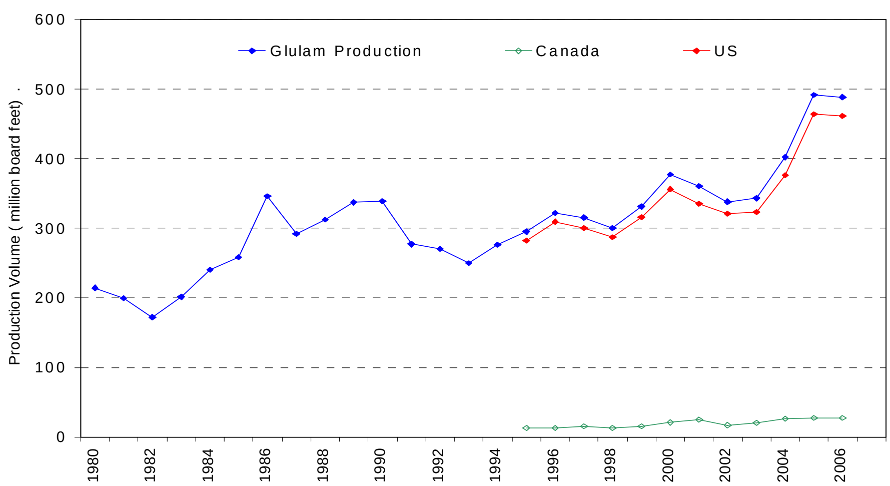

Figure 1. North Amerian glulam beam production has been growing at an annual rate of 7.7% since 1982. (Source: APA 2007)

North American production of glulam beams totaled 488 million board feet (mmbf) in 2006, with 461 mmbf being produced in the U.S. while an additional 27 mmbf was produced in Canada (APA 2007). Despite the fact that glulam beam production declined slightly in 2006 in response to the housing downturn in the U.S., the industry has generally experienced strong growth in the demand for glulam lumber. Between 1980 and 2008, consumption of glulam timber increased at an average annual rate of 7.7% (Figure 1).

Glulam beams are used for a variety of end-use applications in both residential and commercial construction, including floor beams, roof beams and window and door headers (Figure 2). Approximately 71% of glulam production is used in residential construction including both new home construction and repair and remodel projects. In addition to residential construction, glulam beams are also used for commercial and industrial applications, including bridges, marinas and industrial buildings.

While the manufacturing of glulam beams is an established industry, little research has been done on the species and material attributes of lamstock used in the production of glulam beams. The purpose of this research project was to explore the relationship between material use and material attributes within the glulam beam industry. Specifically, the research addressed the following research questions: 1) what timber species are used in glulam beam production, 2) what is the relationship between species use and end-use applications, 3) how important are specific material attributes in the specification of lamstock lumber and 4) how does the location of lamstock within the beam (outer lamina versus inner lamina) affect the importance rating of the different material attributes?

Methodology

The data for this research was collected from a mail survey conducted in the spring of 2007. The survey population was compiled from the AITC and APA member lists and consisted of 38 companies.

Table 1. Material use trends for wood species used in the production of glulam beams in 2006.

	Increased	Remained Same	Decreased	Never Used
Douglas-fir	44.5%	33.5%	22%	14.3%
Sitka spruce	0%	0%	100%	95.2%
SPF	42.9%	57.1%	0%	66.7%
Southern Yellow Pine	64.3%	28.5%	7.2%	33.3%
Hemlock	0%	100%	0%	95.2%
Lodgepole pine	25.3%	74.7%	0%	81%
Ponderosa pine	33.6%	66.4%	0%	85.7%
White pine	0%	50%	50%	90.4%
Hardwood species	39.9%	20.2%	39.9%	76.2%

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Each company was notified by phone that they would be receiving the survey and given an explanation of the purpose of the survey. A total of 21 surveys were obtained from two mailings providing a response rate of 55%.

Demographics

The respondents were divided into two groups to help explore the relationship between company size and material use. Large companies were defined as firms with annual revenue that equaled or exceeded US$20 million in 2006 (38.1% of respondents), whereas small companies reported annual revenue below US$20 million (61.9% of respondents). Survey respondents were also categorized into one of three geographic regions: the U.S. West, the U.S. East and Canada. The analysis of the survey data showed that 47.6% of the respondents were located in the U.S.West, 38.1% were located in the U.S. East and 14.3% were located in Canada.

Species Use

The survey results indicated that the breakdown of species used in glulam beams was strongly influenced by the geographic location of the firm. Not surprisingly, Douglas-fir (DF) was the primary species used in the U.S. West (83.5% of material used). Douglas-fir was followed by southern yellow pine (SYP) which was primarily used in the U.S. East (73.5%) while Spruce-Pine-Fir (SPF) was the primary species used in Canada (58.3%). Interestingly, DF use in the U.S. East and Canada was substantial (16.3% and 30%, respectively) whereas the use of SYP in the U.S. West and Canada was much more limited at 15% and 6.7%, respectively. The survey also asked how respondent's use of different wood species had changed over the past two years (Table 1). The survey results show that while just 14% of respondents reported that they had never used DF, one-third of respondents had never used SYP and two-thirds had never used SPF. Of those who have used DF, 47% reported that their use had increased in 2006 while another 33% reported that their use had remained the same. Similarly, of those who had used SYP, 64% reported that their use had increased in 2006 while an additional 29% reported that it had stayed the same. In contrast, while 22% reported that their use of DF had declined, only 7% of respondents indicated that their use of SYP had declined.

Table 2. Species use for glue laminated beams in residential and commercial applications

	Residential Applications		Commercial Applications	
	Architectural	Non-Architectural	Architectural	Non-Architectural
Alaska yellow cedar	1.2%	0.4%	2.6%	0.5%
Douglas-fir	50.1%	38.5%	49.5%	46.8%
Treated Douglas-fir	5.7%	0%	0.1%	0.1%
SPF	7.9%	15.3%	8.1%	11.1%
Southern yellow pine	21.0%	23.5%	23.0%	27.6%
Treated southern yellow pine	9.6%	17.7%	12.3%	11.6%
Other species	4.3%	4.6%	4.2%	2.3

Survey respondents were also asked to report their use of different timber species for glulam beams used in residential and commercial projects. These two categories were further differentiated into architectural beams (where appearance is an important attribute) and non-architectural beams (where appearance is not an important attribute). Untreated DF was the most often cited species in all four categories followed by untreated SYP, treated SYP and SPF (Table 2). This species ranking was consistent across all four end-use categories. However, it should be noted that the total use of SYP (both treated and untreated) ranged from between 30.6% and 41.2% across all end-use applications.

Lamstock Attribute Importance

Survey respondents were also asked to rate the importance of various material attributes for lamstock using a seven point Likert-like scale (where a rating of 1 indicated that the attribute was not important and a rating of 7 meant it was extremely important). Overall, "gluability" was rated as the most important material attribute (with an importance rating of 6.5) followed by "little product waste" (6.2) and "reliability of supply" (6.1). Survey respondents were also asked to provide ratings for lamstock that was used in the core of the glulam beam as well as lamstock used for the outer face of the glulam beam. The three important material attributes for lamstock used in the core of the beam were gluability (6.3), little product waste (6.1) and reliability of supply (6.0). In contrast, the three most highly rated attributes for lamstock used in the face of the glulam beam were gluability (6.6), high tensile strength (6.5) and minimal slope of grain (6.4). These differences in attribute ratings are not unexpected and can be attributed to the fact that when a glulam beam in a structure has a bending load applied to it, the tension and compression forces are highest in the face lamina. Therefore, the face lamina needs to have higher mechanical strength properties than lamstock located in the core of the beam.

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Custom versus Stock Glulam Beam Production

The survey also asked respondents to indicate the percentage of stock beams versus custom beams that they manufactured. The results show a clear differentiation between respondents based on firm size. Large companies reported that 70.5% of their beam production was stock sizes whereas small firms reported that 72.3% of their beam production was to custom sizes specified by the customer. Respondents were also asked about their techniques for grading lamstock lumber. These results also varied depending on company size, with large companies being almost evenly split between E-graded lamstock (54.4%) and visually graded lamstock (45.6%) whereas small firms relied more on visual grading of lamstock (71.9%) than E-graded lamstock (28.1%). Finally, respondents were asked about their upstream distribution channels of suppliers and their downstream distribution of sales channels. On the supply side, almost two-thirds of large firms purchased their lamstock directly from sawmills, with the other third using non-stocking wholesalers. In contrast, small firms were evenly split between the two supply sources. Small firms and large firms also reported differences on the sales side of the distribution channel. Large firms rely heavily on building materials distributors to sell their glulam beams (66.3%) followed by non-stocking dealers/agents (27.5%). In contrast small firms displayed a wider range of sales outlets including sales direct to builders (39.5%), through building material distributors (24.9%), non-stocking dealers/agents (22.2%), and lumber yards and retail outlets (13.5%).

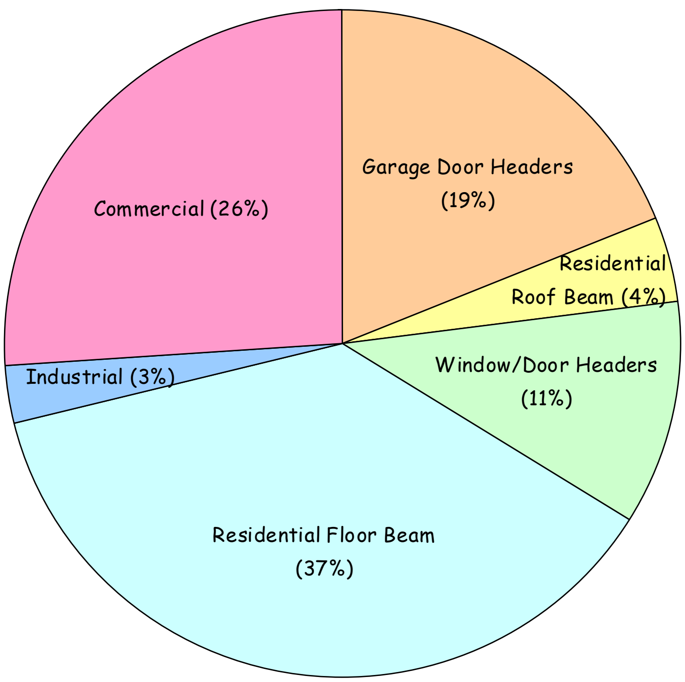

Figure 2. Almost 70% of glulam beams are used in residential construction. (Source: APA 2007)

Conclusions

This research shows that the main species used for lamstock lumber are DF in the U.S. West, SYP in the U.S. East, and SPF in Canada. However, DF lamstock was found to be used to a greater extent in the other regions than all other species. In addition, DF was the market leader in all four end-use applications. Other important results from this research include the following:

- Gluability was the most important material attribute when selecting lamstock. However, in selecting lamstock for the face of the glulam beam, high tensile strength and minimal slope of grain were also very important.
- Large companies produce more stock beams while small companies are more focused on producing custom beams.
- While a majority of lamstock is still visually graded, large companies rely more on E-rated grading while small companies favor visual grading techniques.
- Mill direct and non-stocking agents are the most popular sources of supply for lamstock.
- Large companies rely more on building materials distributors to sell their products, while smaller companies use a variety of outlets.

This research clearly shows that there are important differences between large firms and small firms within the glulam industry. Our research also indicated important differences between firms based on their geographic location. A more detailed analysis of the North American glulam industry will be provided in a CINTRAFOR Working Paper that is expected to be published in early 2008.

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