Domestic Hardwood Lumber Consumption And Exports, *Yesterday And Today*

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Domestic Hardwood lumber consumption has changed considerably in this century, but how do these changes differ from changes that have occurred over the last 50 years and how have they affected lumber price? In this article, we examine how changes in consumption have influenced aggregate Hardwood lumber prices as reported by the U.S. Bureau of Labor Statistics adjusted for inflation (Fig. 1). For this analysis, we separate consumption into four industrial sectors, furniture (wood household, upholstered household, and office, institutional and custom office millwork), construction and remodeling (flooring, millwork, kitchen cabinets and other building products), industrial (primarily pallets and crossties) and other products (staves, handles, and assorted miscellaneous products) and international trade (exports and imports). When useful, we will also examine individual industries within these sectors.

One of the most apparent features of Figure 1 is the price cycle that occurred with varying degrees of amplitude prior to 1998. The cycle was primarily caused by internal buying practices of the furniture industry and corresponding behavior of Hardwood lumber producers and yards. The amplitude of these cycles was intensified by changes in domestic and international consumption influenced by forces outside (exogenous) of the lumber market. While the Hardwood price cycle seemingly has dissipated with the loss of the furniture industry, price levels continue to be influenced by exogenous market forces.

We begin our analysis with 1963, when 68 percent of Hardwood lumber consumed domestically was for furniture and the construction and remodeling (C&R) sectors (Table 1). Another 25 percent of consumption was for industrial products. The two largest subindustries in these sectors were wood flooring and wood household furniture (WHF), which accounted for 48 percent of domestic consumption in 1963. Most WHF and flooring manufacturing facilities where large operations that purchased multiple grades of green and/or AD lumber, maintained large lumber inventories, and kiln dried lumber on site. In some areas, concentration yards were a major component in lumber collection and inventory system, especially in areas with numerous small sawmills.

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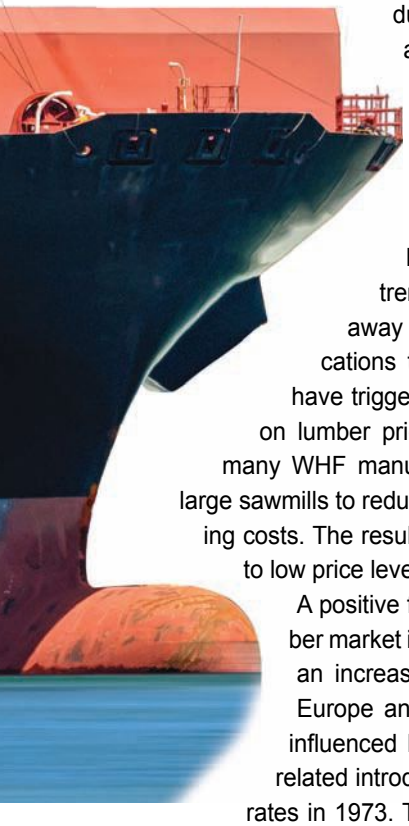
Between 1963 and 1973, Hardwood lumber prices cycled upward and peaked in 1973 (Fig. 1). While consumption estimates for 1973 are not available, estimates for 1972 indicate that total Hardwood lumber consumption was 8.4 billion board feet (Table 1). While consumption by the cabinet and millwork portions of the C&R sector increased between 1963 and 1972, overall consumption in this sector decreased. The overall decrease resulted from a 56 percent reduction in consumption by the flooring industry, as wall-to-wall carpet became the floor covering of choice. While the flooring industry was declining, the WHF was consuming record high volumes of Hardwood lumber, approaching 2 billion board feet in 1972.



Hardwood lumber price cycled downward between 1973 and 1982, reaching an aberrant two-year low point in 1981 and 1982 (Fig. 1). Hardwood lumber consumption during the 1981-82 price valley actually was higher than in 1977, but consumption patterns were changing. In 1982, consumption by the flooring industry bottomed, consumption by the furniture industry declined back to 1963 levels, but consumption by the crosstie and pallet industries trended upward. This proportional shift away from lumber for appearance applications to industrial applications appears to have triggered some of the downward pressure on lumber price. High interest rates also caused many WHF manufacturers, concentration yards, and large sawmills to reduce inventories because of high carrying costs. The resulting inventory reductions contributed to low price level experience in 1981 and 1982.

A positive factor influencing the Hardwood lumber market in the late 1970s and early 1980s was an increase in exports, especially to Western Europe and Japan. This increase was heavily influenced by devaluation of the dollar and the related introduction of floating currency exchange rates in 1973. The impact of the export market was exhibited in reported prices with the inclusion of a price premium for "FULL CARS" of FAS & 1F and FAS & SEL of Red and White Oak in July 1975. Increased lumber exports introduced a new market for kiln-dried lumber, but sometimes required different sawing and sorting procedures to fit the specification of international purchasers.

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Hardwood lumber prices fluctuated but generally increased between 1982 and 1991 as domestic lumber consumption and exports trended upward (Fig. 1, Table 1 and 2). By 1991, the Hardwood lumber market was in a new era in which the market for grade lumber was more diverse because of growth in kitchen cabinets, millwork, and exports. Many of these new consumers of Hardwood lumber purchased kiln-dried material, wanted special color and size sorts, and maintained smaller inventories. A data reporting change that happened in the 1990s was the inclusion of flooring within the millwork category, and the inclusion of custom millwork within the wood office category, for both the U.S. Commerce and Labor Departments' data development (data sources for this analysis).

Domestic consumption and exports of Hardwood lumber increased every year between 1991 and 1999. The relatively mild price fluctuations during this period appear to be the result of temporary over production, inventory adjustments, and varying levels of lumber imports (Fig. 1, Table 1 and 2). In

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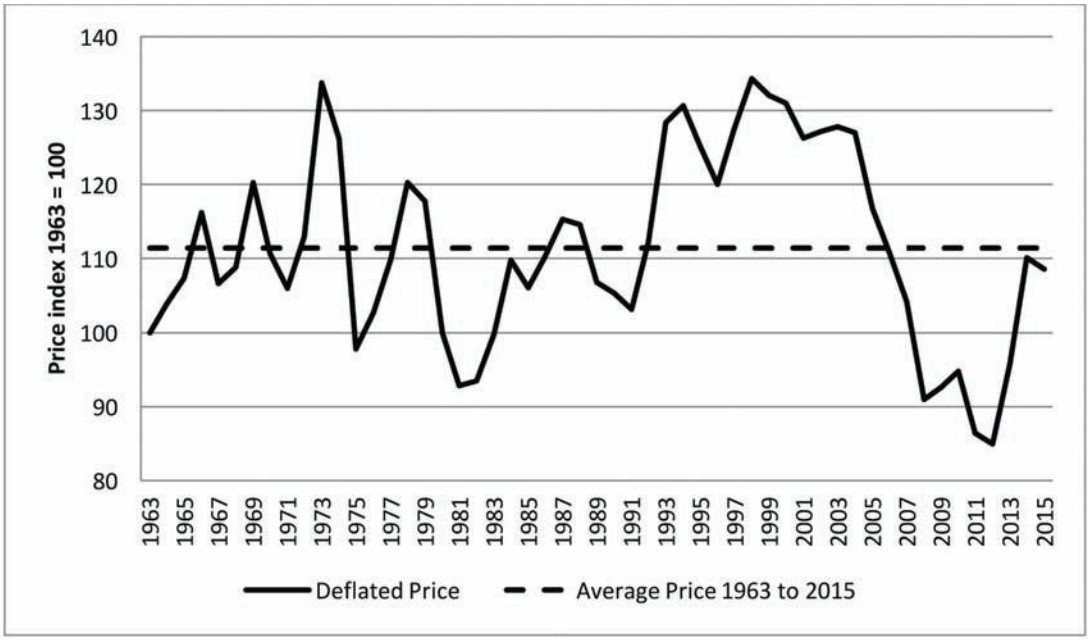
Figure 1 - Deflated annual aggregate Hardwood lumber price index from 1963 to 2015, and average price from 1963 to 2015.



Source – U.S. Bureau of Labor Statistics. Hardwood lumber price adjusted for inflation using price of all commodities (2015 data is preliminary).

DOMESTIC HARDWOOD LUMBER CONSUMPTION

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1999, domestic consumption reached an all-time high of 12 billion board feet and lumber exports approached 1.2 billion board feet for the first time. Industrial lumber consumption increased to nearly 4.6 billion board feet and consumption by the C&R sector was over 4 billion board feet. Even though furniture imports increased in the 1990s, Hardwood lumber consumption by the furniture industry remained at 2.7 billion board feet every year between 1992 and 1999.

The dawning of the 21st century brought declines in consumption few if anyone could have anticipated following the robust market of the 1990s. The furniture industry had the largest decline in consumption, a 2.1 billion board feet decrease between 1999 and 2015 (Table 1). Seventy percent of this decline was the result of reduced production of WHF and increased furniture imports. Lumber consumption by the WHF subsector started to noticeably decline after 1999 and continued to decline for 14 years before leveling out in 2013. The decline in the office and institutional furniture subsector also began to decline after 1999, but since 2009 has increased, and by 2015 accounted for over 50 percent of the lumber consumed by the furniture sector. Part of the reason for this increase in office furniture consumption is the custom millwork portion of this industry. Hardwood lumber consumption by the upholstered subsector increased the first few years of this century, but declined after 2003 from a combination of greater use of plywood and other panel products and reduced demand for the product.

Hardwood lumber consumption by the C&R sector remained around 4 billion board feet between 1999 and 2006, but the millwork and kitchen cabinet subsectors increased during this period. After 2006, consumption declined by 2 billion board feet by 2009 but has increased by over 25 percent since 2009. The industrial products sector did not show a true decline in consumption until after 2008, and between 2008 and 2010, declined by only 800 million board feet. This decline primarily was confined to the pallet industry as crosstie production remained relatively constant.

When examining Figure 1 from 1999 onward, with the knowledge of past market behavior, we can deduct the impact of several interacting exogenous market forces on lumber price. The initial decline in price in 1999 appears to have been a normal market cyclic correction which was internal to the Hardwood market. The continued decline in 2000 and 2001 appears to be the result of reduced consumption by all sectors (Table 1) associated with reduced national eco-

Table 1 – Estimated domestic Hardwood lumber consumption and consumption by major sectors groupings for selected years between 1963 and 2015.

Year	Domestic consumption	Furniture	Construction & Remodeling	Industrial products	Other products
	-- Million bf[1] --				
1963	6,778	2,438	2,147	1,701	492
1972	8,416	3,004	1,825	2.336	1,251
1977	7,876	2,766	1,784	2,498	828
1982	8,136	2,480	1,441	3,342	873
1987	10,261	2,699	2,447	4,118	997
1991	10,001	2,578	2,524	3,952	946
1994	10,767	2,740	3,121	3,990	915
1998	11,879	2,704	3,790	4,636	748
1999	12,011	2,677	4,009	4,578	747
2001	10.825	2,216	3,941	4,109	560
2004	10,726	1,608	4,107	4,408	604
2006	10,701	1,323	4,055	4,614	709
2008	8,924	996	2,907	4,367	653
2009	6,864	619	2,049	3,707	488
2010	6,832	574	2,137	3,574	547
2015[2]	8,061	556	2,587	4,032	866

[1] Annual volumes may not add up due to rounding error.

[2] Data for 2015 is preliminary.

Table 2 - Hardwood lumber exports, import, and net exports (exports minus imports) for selected years between 1982 and 2015.

Year	Exports	Imports	Net Exports
	-- Million bf --		
1982	321	152	169
1987	688	304	394
1991	882	210	675
1994	1,000	369	631
1998	1,058	549	509
1999	1,183	634	549
2001	1,115	602	513
2004	1,283	769	514
2005	1,280	803	477
2006	1,323	689	634
2008	945	361	584
2009	801	222	579
2010	1,078	280	798
2015[1]	1,492	362	1,130

[1] Data for 2015 is preliminary.

nomic activity culminating in the recession of 2001. Lumber prices found an apparent "floor" between 2001 and 2004 as the decline in lumber consumption by WHF industry sector (due to furniture imports) was counteracted by increases in consumption by the cabinet and flooring/millwork industries (as home construction was at all-time highs). International trade may have affected the price of some species and products, but in aggregate was neutral as net exports remained fairly consistent between 1999 and 2004 but a large portion of these imports were low value Aspen from Canada.

While total Hardwood lumber consumption and exports remained historically high in 2005 and 2006, price declined to levels not seen since the early 1990s. Two factors coincided with this price decline - the decline in WHF furniture production which forced plants to close and inventories to be liquidated and high levels of imports up until 2005. The cumulative impact of the housing market collapse and the decline in all portions of the furniture industry after 2006 caused prices to decline to 1981-82 levels. The decline in lumber exports also contributed to the 2006 to 2008 price decline, which is not fully apparent when examining net exports because of the continue importation of low value Aspen from Canada. Although industrial lumber consumption remained relatively high, it was still declining by 2008.

The apparent increase in Hardwood lumber price in 2009 is purely technical as the measured rate of deflation exceeded the decline in un-deflated Hardwood lumber price. In practical terms, Hardwood lumber prices remained at 50-year lows between 2008 and 2012 with the exception of a small increase, which temporally increased consumption by the cabinet and millwork/flooring industries. During this period Hardwood lumber consumption remained at levels last experienced in the early 1960s and lumber inventories of sawmill and secondary manufacturers who went out of business were liquidated and there were few economic incentives for remaining firms to build up inventories.

Lumber prices started to increase in the late fall of 2012 and continued to grow until the fall of 2014 as exports hit 3 concurrent years of record levels between 2012 and 2014 and domestic consumption marginally increased. This increase in Hardwood lumber demand occurred when inventories were low or nonresistant causing lumber prices and production to increase. Still, lumber prices in 2014 were slightly less than the 1963 to 2015 average.

While Hardwood lumber exports declined slightly in 2015, domestic consumption has continued to slowly increase. The decline in lumber prices during 2015 appears to have been a pause caused by production levels temporarily exceeding consumption plus exports. Technically, the low prices of Hardwood lumber shown in Figure 1 suggests an upward potential. The exogenous factors that likely will have the greatest impact on this potential will be a broad-based increase in domestic real wages and income and a renewed growth in Hardwood lumber exports. ■