

What's Driving Lumber Prices?

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After fluctuating around an average price of just over \$200 per 1,000 board feet throughout the 1980s, the price of framing lumber, as measured by the Random Lengths composite, has recently moved toward much higher levels, with greatly increased volatility. From October 1992 to March 1993, the price more than doubled, from less than \$250 to \$506 for the week ending March 19, 1993. The price then dropped back to less than \$300 by mid-July, but during the late summer and fall—a time when prices normally decline—there was another sharp increase, and by late December the price reached new record levels.

Although the recent price levels are actually lower than in the late 1970s in “real” (inflation-adjusted) terms, the rapid increases and volatility have been very disruptive for home builders and remodelers, and for other users of lumber. The price increases from July to December 1993 translate into about \$4,000 additional cost for an average new house (Table 1).

The price of softwood lumber, like the price of any commodity in a competitive market, is determined by demand and supply. Prices will rise or fall to the point where demand and supply are equal. On the demand side, the primary factors are the demands from residential construction, which account for most lumber usage, and the demands from other uses such as transportation and warehousing, where lumber is used for crates and pallets. Exports of logs and lumber also account for a significant portion of demand. In the short term, demand also includes inventory investments by users, dealers, and manufacturers. Inventory changes are often the result of panic buying and other speculative behavior.

On the supply side, domestic production is limited by the supply of timber from private and public lands. Mill capacity has not been a binding constraint in most cases. Supply from domestic mills is supplemented by imports, primarily from Canada. Over the past five years, imports have represented between 26.8 percent and 31.7 percent of U.S. consumption.

Expectations about future supply, demand, and prices play a key role in determining the short-term behavior of market participants. For example, although many factors (including fears of future environmental restrictions) affect harvest levels on private lands, expectations of future price increases encourage private timber owners to defer harvests. On the other hand, if private owners expect prices to fall, they may accelerate harvests. The

primary mechanism by which expectations affect prices in the short term, however, is probably through changes in inventory levels. Rising prices may create the expectation of further price increases, causing speculative behavior that turns expectations of higher prices into self-fulfilling prophecies.

Lumber prices may increase because of increased domestic demand from new home building, remodeling, or industrial uses; because of increased exports; because of reductions in supplies from Canada; or because of reductions in timber harvests on public or private lands. As Tables 2 and 3 show, however, since the all-time peak in lumber consumption in 1987, most of these factors have changed in a manner that would imply lower prices.

Apparent consumption was about 10 percent lower in 1993 than

Table 1 House Price Impact of Wood Product Costs Comparing July 1993 to December 1993

	Structural			Total
	Rate	Lumber*	Panels**	
Mill Prices Increase:				
Mill Price December 30, 1993		\$510	\$374	
Mill Price July 16, 1993		\$295	\$292	
Increase		\$215	\$82	
Percent Increase		73%	28%	
Quantity, Excl Millwork		14.659	6.278	
Quantity, Incl Millwork		15.824	6.325	
Direct Increase, Excl Millwork		\$3,152	\$515	\$3,666
Direct Increase, Including Millwork		\$3,402	\$519	\$3,921
Other Cost Increase:				
Sales Tax	0.04	\$136	\$21	\$157
Financing Cost	0.03	\$106	\$16	\$122
Co-op Brokers Fee	0.03	\$105	\$16	\$121
Total Cost Increase		\$3,750	\$572	\$4,321

Source: Random Lengths, monthly average of framing lumber and panel composite prices; Robert G. Anderson and David B. McKeever, *Wood Used in Residential Construction in the U.S.*
Note: *Per 1,000 board feet; **Per 1,000 square feet.

**Table 2 Lumber Supply and Demand
(Billions of Board Feet, Calendar Years)**

	1987	1988	1989	1990	1991	1992	1993
Apparent Consumption	50.6	48.5	48.0	45.0	42.0	45.5	45.8
Lumber Exports	2.4	3.3	3.4	3.0	3.1	2.7	2.5
Log Exports (Lumber BF)	5.9	6.9	6.8	6.0	5.2	4.6	4.2
U.S. Lumber Production	38.2	38.1	37.5	35.8	33.2	34.5	33.4
Lumber Imports	14.7	13.8	13.6	12.1	11.7	13.4	14.7
Composite Lumber Price	\$228	\$215	\$256	\$231	\$241	\$308	\$396

Source: Production and consumption—American Forest and Paper Association; imports and exports—U.S. Department of Commerce; lumber price per 1000 BF—Random Lengths
Note: Data for 1993 are preliminary, based on partial year; log board feet converted to lumber BF equivalent using factor 1.5.

in 1987. Lumber exports rose in 1988 and 1989, but they have fallen since then and were essentially equal to the 1987 volume in 1993. Log exports also rose in 1988, but by 1993 they had fallen to about three-fourths of the 1987 level.

Between 1987 and 1993 there was a slight increase in private harvests (Table 3) although private harvests, unlike harvests from government lands, are at or near the maximum sustainable rate. Imports of lumber from Canada in 1993 were equal to imports in 1987.

One supply-side factor stands out as having changed in a manner that would contribute to substantial price increases, and that is the supply of timber from federal and state government lands, which declined from 2.71 billion cubic feet in 1987 to 1.47 billion

cubic feet in 1993. Timber harvests from government lands fell in every region of the country, but the declines were concentrated in the coastal areas of Washington, Oregon, and northern California where activities were restricted in order to protect the northern spotted owl.

The right to cut timber on federal lands is sold at auction, and companies purchasing timber cutting rights generally have three years to exercise those rights. Mills dependent on federal timber have typically had an inventory of about two years' supply under contract, as well as an expectation that they would be able to purchase additional timber rights at auction, allowing them to accelerate production in periods of high demand. Currently, however, the national inventory of uncut timber under contract

represents only about one year's supply, and for many mills in the Northwest the inventory of uncut timber under contract has been virtually eliminated, with little hope of replenishment from new auctions. Moreover, much of the timber still under contract cannot be harvested, because of court injunctions and other environmental constraints.

Short-Term Fluctuations

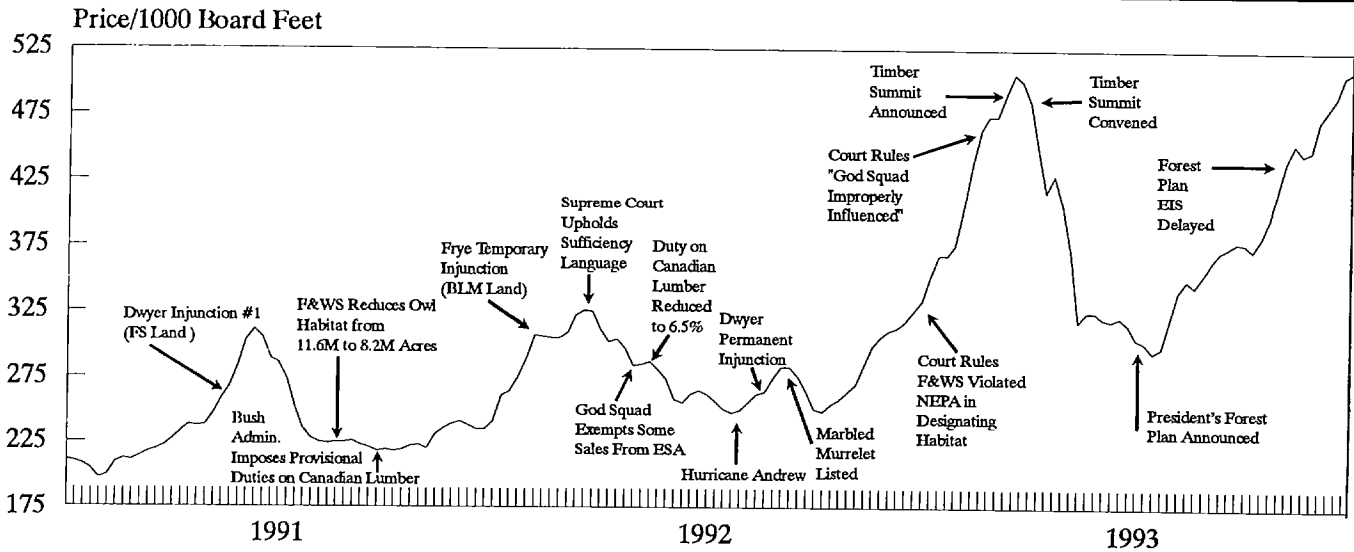
Prices of lumber have not increased gradually with increased demand and constrained supply. Instead they have followed an erratic pattern of booms and busts that are largely attributable to changes in expectations about future supply due to federal court actions and other changes in government policies.

Table 3 Sawtimber Harvest

	1987	1988	1989	1990	1991	1992	1993
National Forest	1.91	1.94	1.74	1.53	1.34	1.26	1.02
Other Public	0.81	0.85	0.77	0.64	0.56	0.56	0.45
Total Public	2.71	2.79	2.51	2.17	1.90	1.83	1.47
Forest Industry	2.76	2.83	2.88	2.88	2.87	2.89	2.87
Other Private	2.22	2.42	2.37	2.33	2.34	2.53	2.54
Total Private	4.98	5.26	5.26	5.21	5.21	5.42	5.41
All Owners	7.69	8.05	7.77	7.38	7.10	7.25	6.89

Source: U.S. Forest Service, TAMM Database; 1993 estimated by American Forest and Paper Association.
Note: Data in billions of cubic feet.

Figure 1 Supply Shocks and Lumber Prices



Source: *Random Lengths, Eugene, Oregon.*

While each price explosion has been followed by a subsequent decline, the decreases have not fully offset the increases and each price spike has been higher than the last.

Figure 1 shows the pattern of weekly lumber prices and some of the key external shocks that have contributed to price movements. External developments promising more plentiful supplies have often preceded price

declines, but declines may also occur spontaneously when speculative bubbles cause prices to move too far out of line with underlying fundamentals of supply and demand.

Short-term price movements also reflect changes in actual or expected demand. But during the 1980s, when supplies were not so uncertain, changes in housing starts and other demand factors had only limited

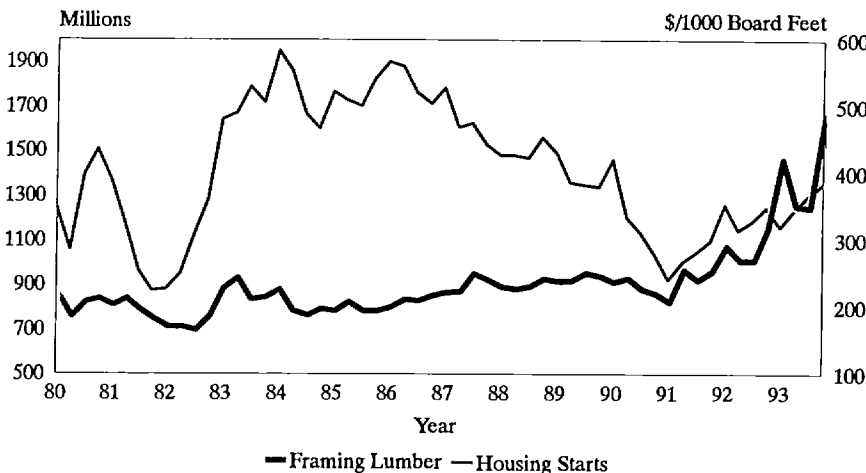
impact on prices. Clearly the changes in lumber prices in 1992 and 1993 are disproportionate to the changes in housing activity (Figure 2).

Most federal court actions have concerned future sales of timber cutting rights, not current harvests. Price spikes occurred when market participants reacted to the prospect of reduced future timber availability.

In addition to the price spikes caused by court actions, the price of lumber has responded to shifts in administration policy and rhetoric. When President Clinton announced and then convened his Forest Conference in March and April 1993, it helped burst the speculative bubble and sent prices tumbling. But when he presented his forest plan with a sharply restricted sales volume, prices began to soar again. Price increases were further fueled by events indicating that, because of continuing litigation, even the modest supplies promised in the Forest Plan would not be forthcoming.

Inventory changes probably played the principal role in translating

Figure 2 Framing Lumber and Housing Starts, A Quarterly Comparison (Seasonally Adjusted)

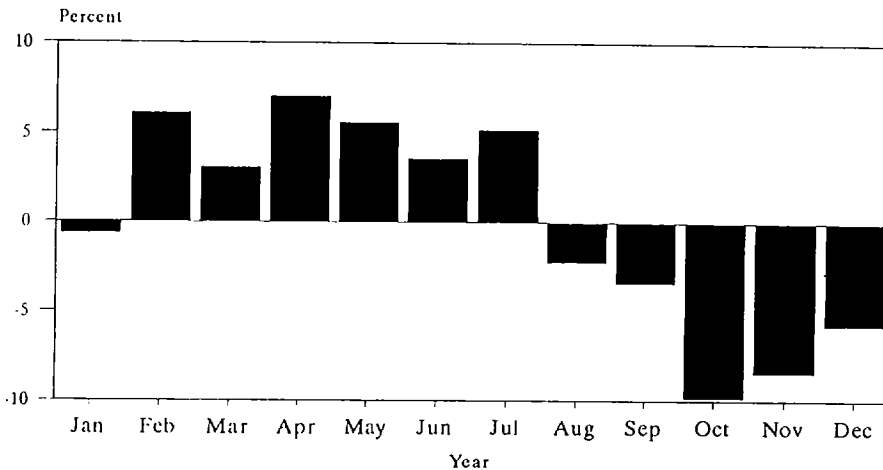


Source: *U.S. Department of the Census; Random Lengths.*

Chronology of Lumber Supply Shocks, 1989-1993

- 9/29/89 Congress approves amendment (Section 318) providing for a 3.85 BBF harvest in the Pacific Northwest with "sufficiency language" declaring that the measure meets relevant environmental statutes, limiting court challenges.
- 4/2/90 Jack Ward Thomas report issued, calling for the set-aside of 8.4 million acres to protect the northern spotted owl.
- 7/19/90 The northern spotted owl is listed as threatened by the U.S. Fish and Wildlife Service (FWS).
- 9/18/90 The Ninth Circuit Court of Appeals overturns the judicial review (sufficiency language) in section 318.
- 2/26/91 U.S. District Court Judge Thomas Zilly orders FWS to designate critical habitat for the northern spotted owl.
- 5/6/91 FWS proposes 11.6 million acres as critical habitat owl.
- 5/23/91 Judge William Dwyer enjoins 80 percent of the U.S. Forest Service's (USFS) timber sale program.
- 7/24/91 Four federal scientists ("Gang of Four") recommendations to three congressional committees, calling for the setting aside millions of acres to protect spotted owl and anadromous fisheries.
- 8/13/91 FWS revises its proposed designation of critical habitat for the northern spotted owl, calling for 8.2 million acres.
- 10/4/91 Bush administration self-initiates countervailing duty investigation of softwood lumber from Canada. Temporary duties of up to 15 percent from certain provinces.
- 1/7/92 Endangered Species Committee ("God Squad") begins determining the fate of 44 Bureau of Land Management (BLM) timber sales in Oregon.
- 1/15/92 FWS issues its final designation of critical habitat: 6.9 million acres.
- 2/19/92 U.S. District Court Judge Helen Frye issues a temporary injunction against BLM timber sale program.
- 3/6/92 Commerce Dept. announces preliminary duty of 14.48 percent on most imports of softwood lumber from Canada.
- 3/25/92 U.S. Supreme Court unanimously upholds Section 318 sufficiency language.
- 5/14/92 God Squad exempts 13 of 44 BLM timber sales from the provisions of the Endangered Species Act. Interior Dept. simultaneously releases the 5.4 million acre draft recovery plan and the 2.8 million acre owl preservation plan.
- 5/15/92 Commerce Dept. issues final determination reducing duty on lumber from Canada to 6.51 percent.
- 5/28/92 Judge Dwyer rules against the adequacy of USFS environmental impact statement (EIS) and issues preliminary injunction on USFS timber sales.
- 6/8/92 Judge Frye issues an injunction against BLM timber sale program. Injunction includes timber sales approved exempted from the Endangered Species Act by the God Squad.
- 7/2/92 Judge Dwyer permanently enjoins 80 percent of USFS West Coast timber sale program and orders new EIS.
- 8/27/92 Hurricane Andrew strikes southern Florida, causing emergency demand for plywood and (to a lesser extent) lumber.
- 1/16/93 USFS restricts logging in California to protect California spotted owl, unlisted relative of northern spotted owl.
- 2/10/93 Ninth Circuit sets aside God Squad decision on timber sales by BLM, ordering an inquiry on whether improper political influence was exercised. BLM later withdraws its petition.
- 4/2/93 President Clinton convenes the Forest Conference, promising balanced solution to controversy over forests.
- 7/1/93 Clinton forest plan announced. Administration issues report calling for a harvest level of 1.2 BBF in the region, down from over 5 BBF in the mid-1980s. Administration rejects a legislative solution.
- 10/7/93 Plaintiffs in the spotted owl lawsuit agree not to oppose lifting injunction on 83 million board feet of timber. Request is never submitted on realization that the identified timber sales would not comply. Administration agreed to oppose sufficiency language.
- 11/9/93 Judge Dwyer extends the deadline for administration to submit forest plan EIS from November 30, 1993 to February 28, 1994 and the deadline for a record of decision by the Forest Service to March 31, 1994.

Figure 3 Seasonal Factors for Random Lengths Composite Lumber Price



Source: U.S. Department of the Census

Note: This chart shows that prices are typically below trend in the fall and above trend in the spring.

ing expectations and fears into price changes. It takes more than six months from the time a tree is felled to the time it is delivered as lumber to a building site. For most of that time it is in inventory in the form of logs or lumber at the mill, lumber at the wholesale distribution level, or lumber at the local lumber yard. Thus, with consumption approaching 50 billion board feet, the total inventory of logs and lumber is equivalent to 25 billion board feet of lumber. When supplies are under pressure and prices are expected to rise, producers and distributors may increase inventories. A 20 percent inventory increase, or 5 billion board feet, over a three-month period would be equivalent to an increase in final consumption of 20 billion board feet at an annual rate. Clearly, even a modest relative change in inventories can put a lot of pressure on supply.

A final factor affecting prices is the seasonal variation in home building, timber harvesting, and the other determinants of demand and supply. The net result of seasonal factors is to raise lumber prices in the spring and lower them in the fall. The lum-

ber price increase of about 30 percent from July to October of 1993 is especially startling, because prices typically decline by about 15 percent during that time of the year. Other things being equal, seasonal factors produce a 15 percent increase in lumber prices from October to February, and prices typically remain high during the spring building season (Figure 3).

The Outlook

The run-up in lumber prices over the past few months contains some short-term speculative elements, but the underlying trend is toward higher average prices. The prospects for significant sales of federal timber in the Northwest are poor, and the remaining inventory of uncut timber under contract is being depleted. Demand for lumber for home building and remodeling will continue to gradually increase. Continuing growth in the U.S. economy will likewise mean increased industrial demand for lumber. And if currently depressed foreign economies begin to recover, export demand will put additional upward pressure on prices.

A short-term bubble has been overlaid on the underlying upward pressure. Inventory swings and other speculative behavior have created a spike in lumber prices, and the bubble is likely to burst before long. The average price in 1994 will probably not exceed the price at the end of 1993. It is difficult to predict how high prices will go, but the Random Lengths composite is unlikely to exceed \$600 before the correction occurs. Each price spike has been higher than the last, however, and any price decline is likely to be short-lived, unless there is a change in the fundamentals.

Over the longer term, higher prices and price uncertainty will stimulate efforts to build with alternative materials, and even a modest shift toward substitution and conservation could have a big effect on prices. Opportunities and incentives for conservation and substitution are even greater among industrial users than among builders. Indeed, the very limited growth in apparent consumption in 1993, despite increases in home building, suggests industrial users have already cut back their demand.

On the supply side, higher prices should reinforce efforts to get more lumber from each log and to develop engineered wood products to substitute for sawn lumber. The success of recycling programs has reduced the demand for new pulp and could stimulate the use in lumber production of some fiber that now goes into paper products.

It will take several years for new wood products technologies to be adopted and for new materials and methods to trim demand for lumber from residential construction. These longer term supply and demand responses will put a lid on the ultimate increase in lumber prices, but short-term price spikes will continue to threaten disruption of the housing market.