

Timber to lumber: why landowners get paid so little for their trees.

Fact Sheet F2021-2

Matthew Pelkki, Arkansas Center for Forest Business
Nana Tian, Arkansas Forest Resources Center
Kyle Cunningham, University of Arkansas Division of Agriculture

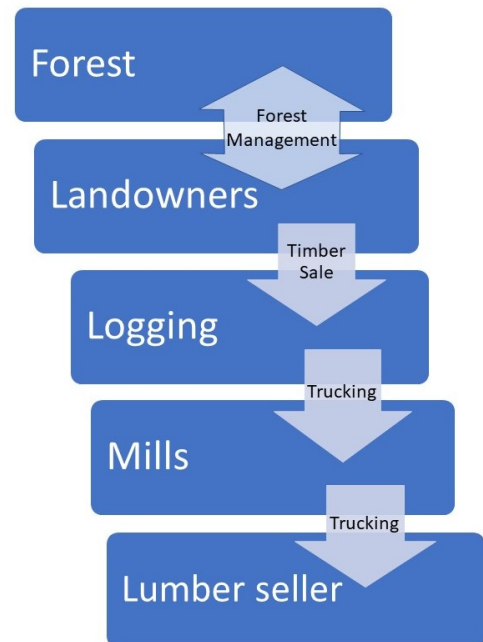


Since March of 2020, if you've been wanting to build or remodel your home or build anything using softwood lumber, you know prices went through the roof in 2020, and while they have come down somewhat today, they are still above pre-pandemic levels. And if you are a timberland owner, you also know that the price you are paid for your timber hasn't followed lumber prices. In fact, you might recognize that the price you pay at a lumber wholesaler or retailer seems out of proportion with what you receive for your standing timber or stumpage, as it's known in the forest industry. Looking at various retailers, the average price of a southern yellow pine 8-foot 2x4 is \$4.12¹. Converting that directly to green wood has a value is \$113.88/ton. In Arkansas, landowners receive \$22 to \$29 per ton for standing timber². So, who gets the other \$84 to \$90 per ton?

Let's look at the supply chain for lumber in the figure. The landowner grows and sells the wood to a timber buyer or mill or logger, who then harvests and hauls the logs to the mill. The mill unloads the logs, stores the logs, then saws the logs into rough lumber. The mill sorts the lumber, dries it, and finishes it with a planer. The finished lumber is then graded and packaged, and the mill loads it on a truck that hauls it to a lumber wholesaler or retailer. The wholesaler unloads the lumber, stores it, displays it, and often helps load and deliver the lumber to the final buyer.

All these operations cost money, and the costs of harvesting, hauling, and milling that occur in between are subtracted from what a consumer is willing to pay for lumber to get to the price a timber buyer can pay a landowner for standing timber. Using price reporting data on softwood lumber, hauling rates, timber harvest costs, and milling costs, we can see where the money goes if we work backward from the lumber.

In this example, values for a standard 8-foot 2x4 will be used. A 2x4x8' is actually 1.5x3.5x96 inches, which is 3.5 board feet. Using a price of \$4.12 for a 2x4, lumber is \$1,177.14 per 1000 board feet. (1 MBF = 1000 board feet). Now we must account for the moisture difference in dried lumber and green lumber. Lumber is dried to about 20% moisture content, while standing logs, when cut and delivered, have close to 100% moisture content, which means the weight of the water in a log is equal to the



¹ Average prices researched online on 11/24/2021 from Lowe's, Home Depot, Sutherlands, Ivey's, and Menards.

² Timber-Mart South, 3Q 2021

weight of the wood. 1 MBF of green wood weighs about 12,450 pounds. Using these two facts, the price for 1 MBF of dry lumber can be converted to dollars per green ton of wood (\$/gt) by dividing by 10.377. So, that 2x4 in the lumber store that sells for \$4.12 equates to a value of \$113.88 for a green ton (gt) of wood.

The average cost of a pine 2x4 delivered to retailers and wholesalers is \$788.50 in the Western Gulf Region of the US³. So, the retailer is marking up the lumber around 50%, which is \$37.60/gt. This pays for all costs as well as profits to the lumber seller.

The typical mill FOB price of 2x4s is \$700 per MBF of lumber³. So, trucking from a mill to a lumber dealer is \$88 per MBF or \$8.51/gt.

The total costs of milling and drying lumber (including labor, wages, energy, taxes, and profits to the mill owner) is typically \$250/MBF or \$24.18/gt. This also includes the fact that not all the volume of a log is converted into lumber. A saw log produces lumber, wood chunks, sawdust, and bark. Since lumber is much more valuable than the “residual” products, they reduce the value of a log to the mill.

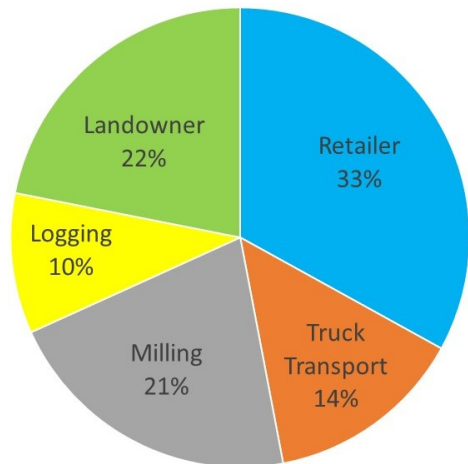
From data collected around the South², the average cost to cut trees, skid them to the landing, remove the tops and cut them to the proper length is \$11.24/gt. And based on an average 1-way haul of 53 miles, hauling logs from the forest to the sawmill costs \$7.42/gt.

Starting with lumber valued at \$113.88/gt, what is left after all the expenses can be calculated by:

$$\$113.88 - \$37.60 - \$8.51 - \$24.18 - \$7.42 - \$11.24 = \$24.93$$

The \$24.93 shown here is well within the typical range of stumpage prices. We must remember that any given tree is cut into many different sizes of lumber, and this simple example assumes all the wood is cut into 2x4s. Once we remove all the costs and profits in the supply chain from the value of the lumber, we have the money left over to pay the landowner for their trees.

The pie chart to the right shows the value distribution of lumber by parts of the supply chain. In this example, the retailer is receiving nearly one-third of the total “value” of the wood. The landowner receives the second-largest share of the value of 22%. Loggers receive the smallest portion of the value-added supply chain. Remember that these numbers are an example only and may not be typical for different regions and timber products.



But why won't timber stumpage prices rise and fall with lumber prices? They do, but it takes 12-18 months for this to happen, as it takes time to increase capacity at sawmills, hire new workers, and build up capacity in the logging workforce; this creates a “bottleneck” in the transfer of lumber value to landowners. There is some room in the prices from the landowner to the mill in logging and hauling costs. Depending on how close or far your timber is from the mill and how easy or difficult it

³ Random Lengths Weekly Report on North American Softwood Lumber Markets, Volume 77, Number 4, November 5, 2021.

is to log, a landowner might get a little more for their timber. But this aspect of the supply chain represents a small fraction (<15%) of the total costs of turning standing trees into lumber in a store.

Then there is the issue of timber supply. In Arkansas, we harvest about 18 million tons of pine annually, but pine growth is more than 28 million tons. And this has been going on for nearly 40 years. There is more pine sawtimber standing in Arkansas than the industry can harvest, and when supply exceeds demand, prices stay low. The landowner, in this case, has no market leverage; there are plenty of landowners willing to sell timber at low prices. In the case of the pandemic, lumber production is growing, and lumber prices are expected to fall by the second half of 2022. So, the huge price spike in lumber trickled down only as far as sawmills, which have added tremendous capacity in the last year.

What needs to happen to cause an increase in pine stumpage prices? Increasing the use of wood in the United States for construction and consumer products and energy is one way. Another way would be to have large insect and disease outbreaks in our forests followed by forest fires. This could dramatically lower the volume of standing trees, so landowners who did not lose their trees would likely get a higher price.