MARKET TRENDS

1ST QUARTER, 2023

The latest market trends and indices impacting the Timber and Wood Products sectors.

Compliments of WillSonn Advisory, LLC

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Q1 2023 HIGHLIGHTS

Market Trends

- Builder sentiment remains weak, spending anemic (page 5-6)
- Housing Affordability remains low as mortgage rates rise, income lags (page 7-8)
- Total Housing Starts down YOY as the Multi-Family sector gains share (page 9-10)
- Inventory of Homes for Sale builds as sales slow (page 11-12)
- Product Prices tick up in Q1 (page 13-14)
- PNW and Southern log prices slip 3-5% this quarter (page 15-16)
- Gross sawmill margins continue retreat while South:PNW spread widens (page 17)
- US South Timberland Sales prices post record values in 2022 (page 18-19)

Deeper Dive

- Trends in NAHB Price & Construction Cost Surveys (page 20-28)

In Case You Missed It

- Excerpt from a Recent WSJ article on Weyco's Carbon ambitions (page 29-31)

About WillSonn Advisory, LLC

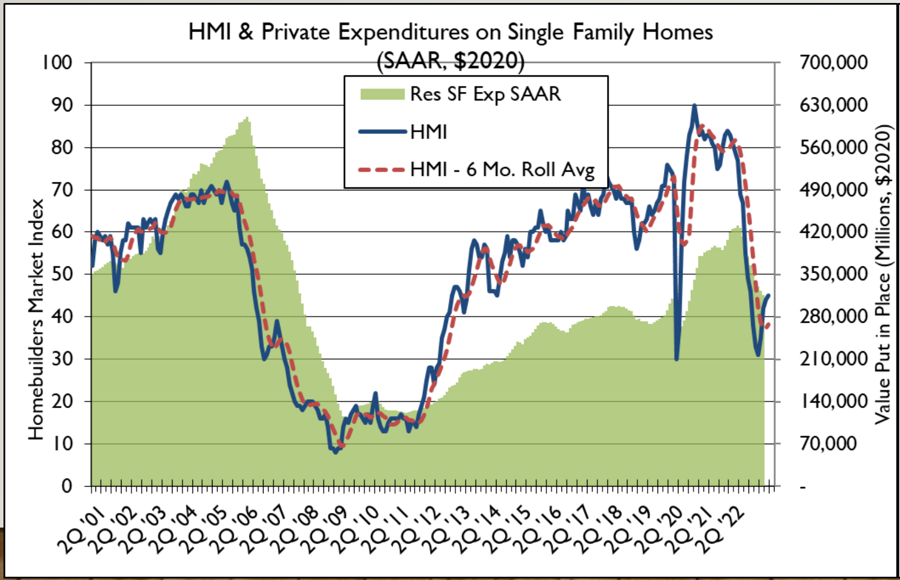
SECTION 1:

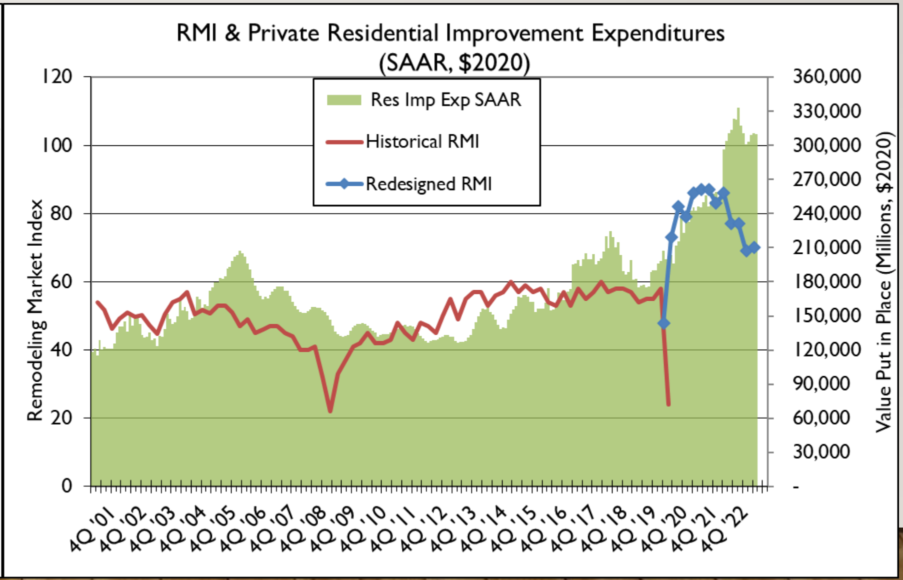
LATEST TRENDS

- Housing Indicators
- Housing Starts
- Home Sales
- Wood Product Prices
- Log Prices
- Timberland Values

BUILDER SENTIMENT & PRIVATE RESIDENTIAL EXPENDITURES

- **Recent Trends**: The Homebuilder Market Index (HMI) ended Q1 2023 with a reading of 45, up 14 points from the December 2022 reading and 32 points lower than April 2022. The Remodeling Market Index (RMI) dipped to 70 in Q1 2023.
- 2022 Real Expenditures on Single Family New Residential equaled 2021 expenditures, following a 29.2% gain in 2021. 2022 Real Expenditures on Private Residential Improvement increased 24.3% above 2021 levels, following 2021's 15.9% increase.
- **Explanation**: Rising interest rates dampened Homebuilder and Remodeler sentiment. Despite faltering housing starts, longer construction times plus strong remodeling activity, coupled with rising labor and record material costs, kept expenditures elevated. Higher interest rates are redirecting housing expenditures to the remodeling sector, as homeowners shun higher mortgage payments.
- **Implication**: Declining builder confidence generally bodes poorly for near to intermediate-term housing starts. Higher construction costs risk limiting the pool of qualified buyers and cause delays in construction. A resumption of pre-pandemic consumer interests (e.g., travel, eating out), along with rising inflation and borrowing costs will may moderate remodeling activity in the next few quarters.
- **Expectation**: Construction expenditures should steady or improve as lower building material prices make their way through the distribution channels and builder sentiment improves. However, constrained supply of existing homes, a dearth of developed lots, scarce labor and lower contractor productivity will keep residential construction and improvement expenditures elevated.

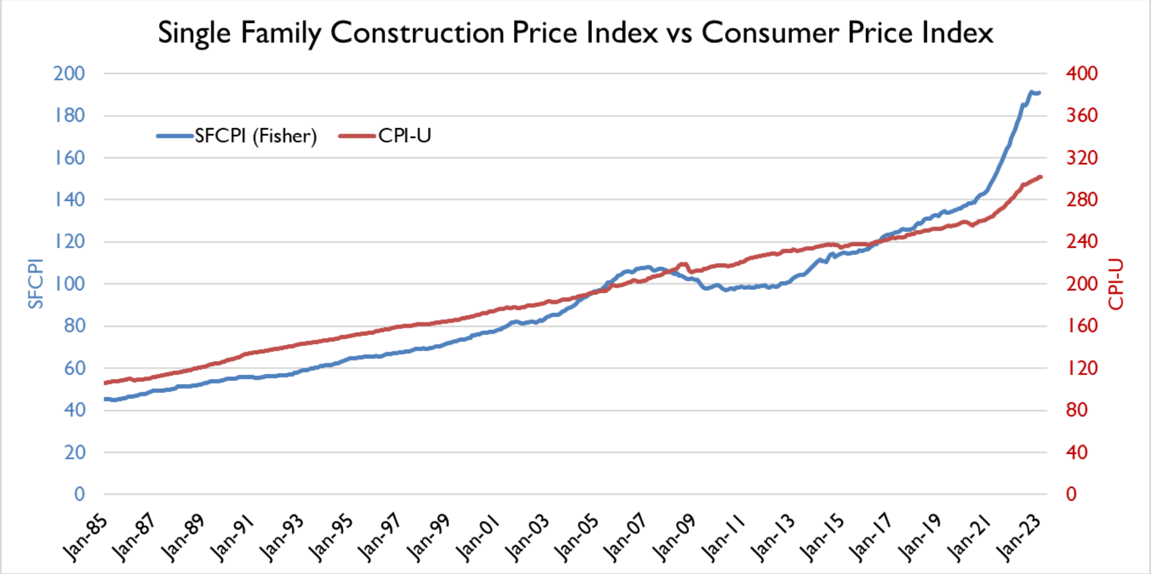




Data Sources: Census Bureau, NAHB, Dept. of Commerce Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: BUILDER SENTIMENT & PRIVATE RESIDENTIAL EXPENDITURES

- **On the previous page**, NAHB's Homebuilder Market Index (HMI) and Remodeling Market Index (RMI) are measures of home builder and remodeling contractor sentiment.
- The monthly HMI and quarterly RMI are dispersion indices, measuring the proportion of respondents who have a positive versus negative view (neutral responses are ignored in the calculation). A reading over 50 indicates a prevailing positive view of conditions.
    - Note that the NAHB instituted a new RMI survey beginning in Q1 2020, such that comparisons to prior years are meaningless.
- Private Construction Expenditures depicted on Single Family Housing and Remodeling are in constant 2020 dollars, (i.e., inflation adjusted) using the Consumer Price Index – All Urban Consumers.
- **In this chart**, I show the Single Family Construction Price Index (SFCPI), produced by the Census Bureau, which reflects the cost of construction, including labor, materials, and permitting, but excludes the cost of land and other non-construction costs. This index also holds the characteristics of homes under construction constant, so it does not reflect cost changes due to increasing or decreasing house size or amenities.
    - Over the Past 10 years, it is clearly visible that the Single-Family Construction Price Index has far outpaced overall inflation, at a pace more than 3 times as fast, increasing 92%, compared to 31% for the CPI-U index.
    - Also note that the rise in both indices has slowed over the last few months, boding well for future moderation of YOY inflation figures.

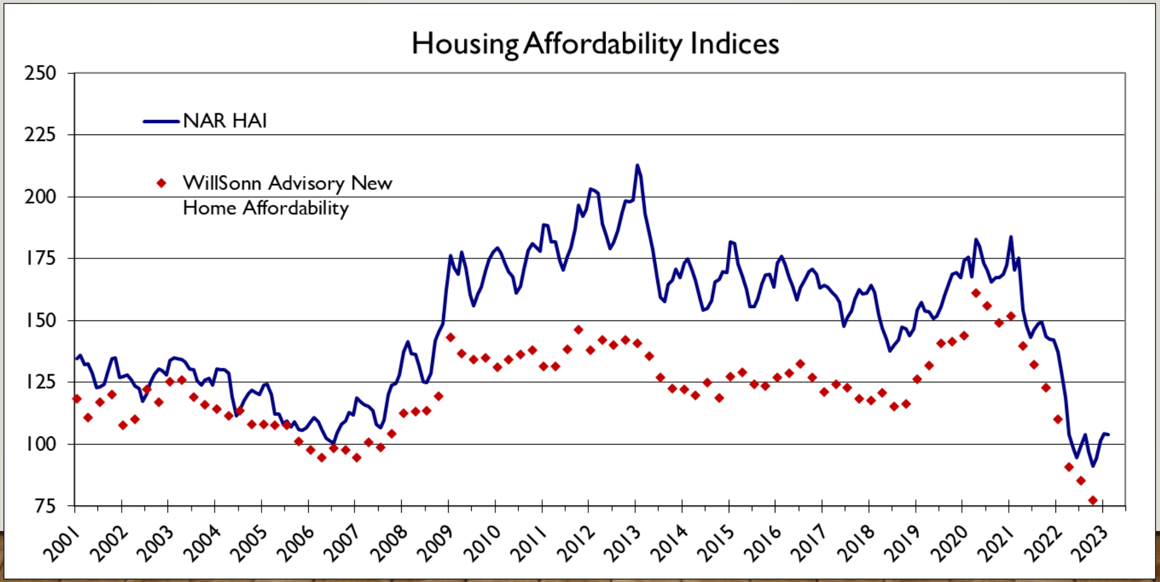


Data Sources: Census Bureau, FRED website

Charts & Analysis: WillSonn Advisory

HOUSING AFFORDABILITY

- **Recent Trends**: The Housing Affordability Index ("HAI") (blue line) has fallen from 184 in January 2021, to 104 in February 2023. The New Home Affordability (red diamonds) notched lower to 77 in Q4 '22, a new record.
- **Explanation**: In 2019 and 2020, mortgage rates eased and median family income accelerated, bolstering this measure of affordability, but soaring home prices in 2021and 2022, and now, elevated mortgage rates and lagging income gains, are pushing affordability lower.
  - As cautioned last year, existing home affordability was overstated in late 2020/early 2021; bidding wars pushed transaction prices above listing prices in many markets and three stimulus checks artificially (and temporarily) boosted family income figures.
- **Implication:** Over the years, there is a rather weak link between affordability and housing starts (R-squared of just .17). In fact, the highest levels of housing starts occurred when affordability was in a trough (~2006). Thus, a "fear of missing out" may have spurred some home buyers to buy sooner than later, before home ownership was forever out of reach. Easy credit back then also helped.
- **Expectation**: The battle to temper inflation will continue to keep mortgage rates higher while thin existing home inventories will keep home values elevated. Expect affordability to continue to remain under pressure in the coming months, but don't worry too much about its direct impact on housing starts. Also don't expect builders to pass along lower building material costs to buyers as lumber and OSB prices ease; rising labor costs, lot prices and permitting costs are eating away at the added margin.

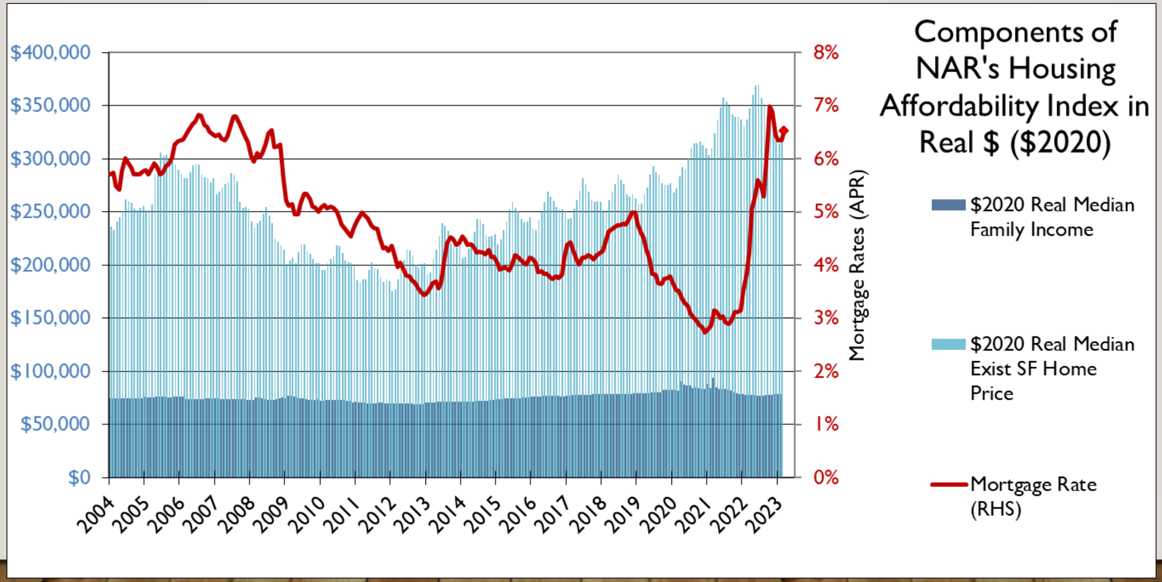


Data Sources: NAR, Census Bureau,, Dept. of Commerce

Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: HOUSING AFFORDABILITY

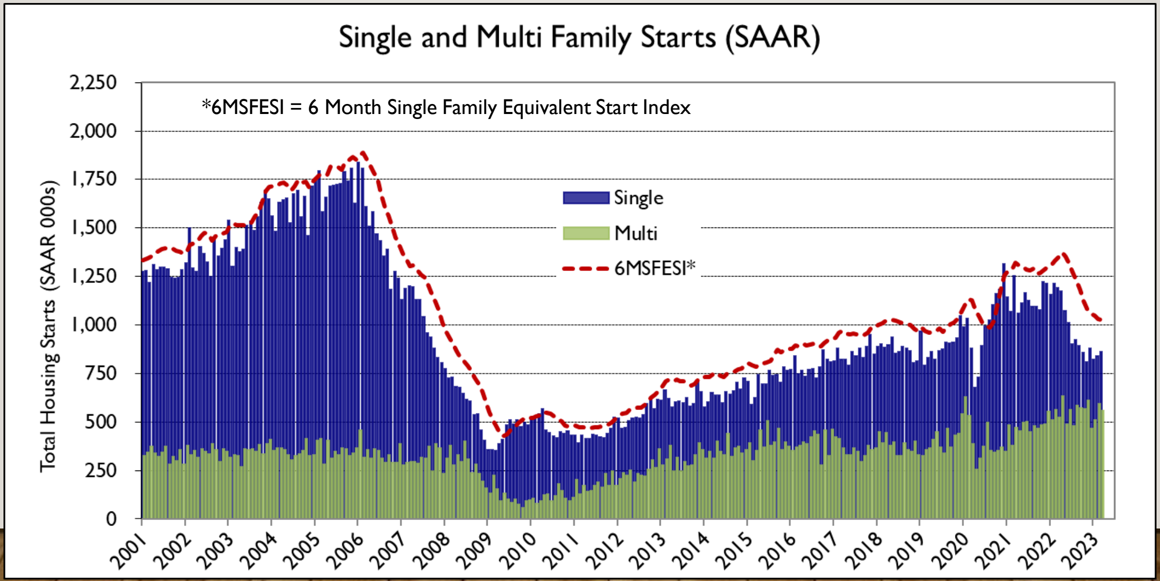
- **On the previous page**, the National Association of Realtors' Housing Affordability Index ("HAI") is based on three inputs: list prices of existing homes for sale, 30-year fixed mortgage rates and median family income. WillSonn Advisory's New Home Affordability uses the actual sales price of new homes, with the same income and mortgage rate figures as the HAI.
  - A reading of 100 means that a family with median income would need to spend fully 25% of its monthly income on a mortgage to purchase the median priced existing home. A reading of 140 means that 25% of the median family income is 1.4 times the mortgage payment for the median priced existing home.
- **The chart below** displays the movement in the three components of the NAR Affordability Index – home prices, mortgage rates and family income – in Real dollar ($2020) terms. Adjusted for inflation, in 2022 compared to 2021, median real home prices were up 2.6% while real Median Family Income fell -7.0%. With average mortgage rates 80% higher, Mortgage Payments for the costlier median priced home was 50% higher than 2021, eating up an increasing proportion of family income. All of this has resulted in a much lower Affordability Index.
- In February 2023, mortgage rates averaged 6.34%, 251 basis point higher than February 2022. Holding home price and income steady, a 50-basis point increase in mortgage rates drives the Affordability Index down about 10 points. 30-year Fixed Rate Mortgages averaged 6.52% in March 2023, so a small decline in affordability is expected in the near-term.



Data Sources: NAR, FRED website
Charts & Analysis: WillSonn Advisory

HOUSING STARTS

- **Recent Trends:** 2022 Housing Starts registered 1.553 million units, compared to 2021's total of 1.61 million units. Single Family Starts were down -10.8% while Multi Family Starts were up 14.9%, compared to 2021. March's preliminary reading of 1.42 million units is well below the recent peak of 1.805 million units registered in April 2022.
  - The WillSonn Advisory "6 Month Single Family Equivalent Start Index," recasts a multi-family unit into a single-family unit based on relative wood use, so a better measure of Housing Start's demand for wood. March's 1,027,000 unit reading represents 54% of the 2006 peak of 1.9 million SFES's.
- **Explanation**: Higher home prices alone were a threat to sustained gains in Housing Starts. Now, with elevated interest rates and persistent inflation more than offsetting Family Income gains, aspiring homeowners are being forced to remain in the rental market, shifting the market from single to multi-family construction (and pushing rents higher).
- **Implication**: Housing Starts typically account for 30%-40% of wood usage, so as housing goes, so goes lumber and panel demand.
- **Expectation**: With the chance of a recession on the horizon, Housing starts are expected to remain under pressure over the next few quarters. In the longer-term, we can expect housing to continue to improve as the housing deficit is replenished and as existing home availability remains tight. Gains may also be tempered by limits on construction labor and developed lots, and tight lending standards.

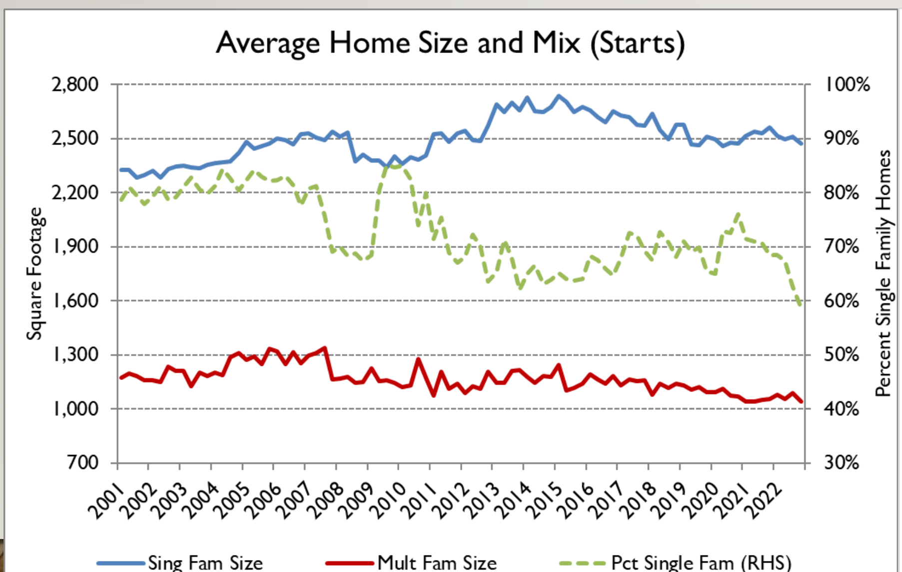


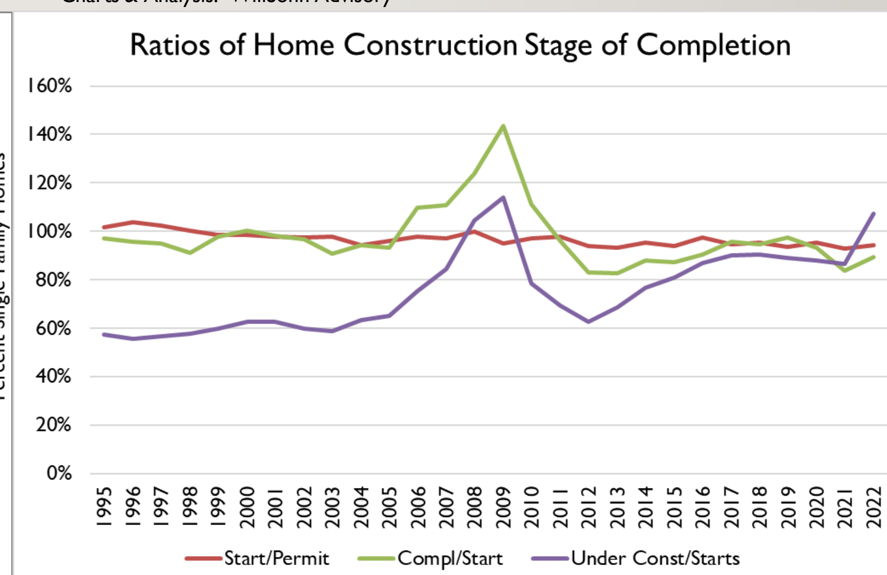
Data Source: U.S. Census Bureau
Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: HOUSING STARTS

- For the Single-Family Equivalent Start Index **on the previous page**, Multi-family units use approximately 2/3 as much wood per square foot of construction compared to a Single-Family Unit, and since Multi-Family Units are about half the size of Single-Family homes, I count them as a 1/3 single-family-equivalent.
- On the **bottom left chart**, you can see that the size of Single-Family Home Starts trended smaller in 2022, averaging 2,500 sq. ft., off a modest -1.5% from 2021's average of 2,538 sq. ft. The average size of Multi-Family Units started in 2022 averaged 1,066 sq. ft., up 1.6% from the 2021 average of 1,049. Single Family units made up 65% of Total Starts in 2022, 5 points lower than 2021 and 17 points below the pre-bust average of 82%.
- The average number of Permits fell along with Starts in 2022, with Starts averaging 94% of Permits. In the **bottom right chart**, you can see that the ratio of starts to permits has been declining over time, such that the old rule of thumb of ~97 Starts per 100 Permits should be reduced to 95 or lower. Also declining is the ratio of Completions to Starts (the green line), which has averaged 89% in 2022. As noted earlier, the run up in construction material prices, along with supply chain woes and backlogged inspections delayed many completions in 2022. Thus, the number of homes under construction relative to starts have increased.

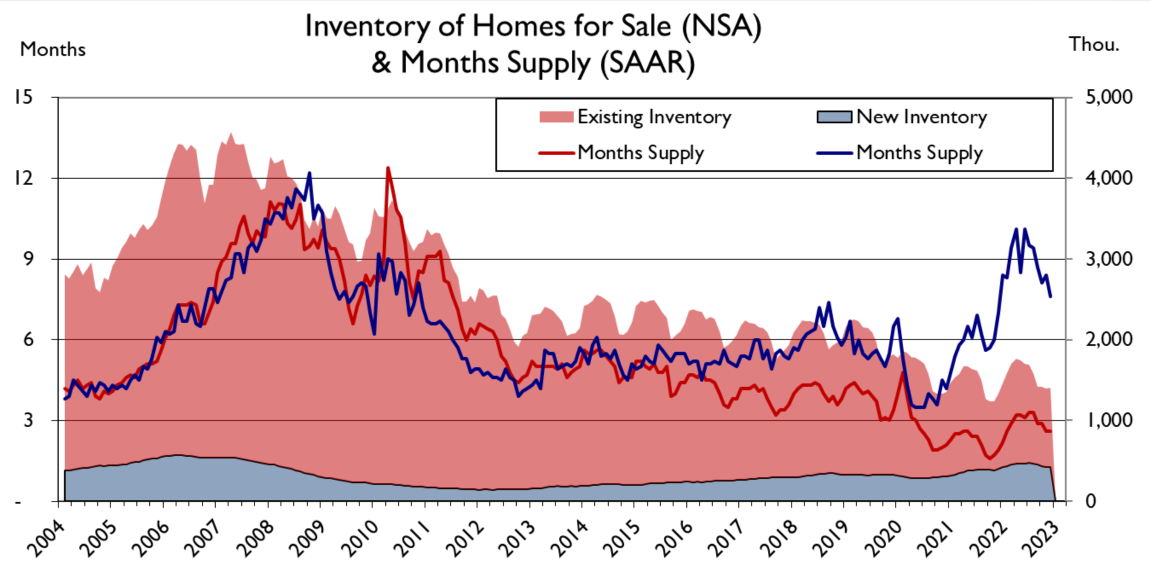
Data Source: U.S. Census Bureau Charts & Analysis: WillSonn Advisory





PACE OF HOME SALES & INVENTORIES

- **Recent Trends**: The Inventory of Homes For Sale (Existing + New) moved higher to 1.405 million units in March, down 10,000 units from December 2022, and up 5% (69k units) from March 2022. Separately, Existing Home Inventories are up 50k units, while New Home inventories are up 19k units, compared to March 2022. At their respective current pace of sales, there are a scant 2.6 months of sales in Existing Home inventories, and an excessive 7.6 months of sales in New Home inventories. Five or six months is normal.
- **Explanation**: The inventory of existing homes has been suppressed as homeowners have stayed put, increasing tenure from six or seven years a generation ago, to nine or ten years today. Elevated mortgage rate are an impediment to turnover of existing homes. New home inventories have surpassed the high end of the normal range as the lack of affordability has pushed buyers to the sidelines.
- **Implication**: Tighter inventories are contributing to higher home prices, which in turn limits existing homeowners' options to purchase replacement homes, a vicious cycle. While New homes are a major user of building materials, many R&R projects occur within the first couple years of ownership, so lower Existing home turnover can have a negative effect on repair and remodel demand as well.
- **Expectation**: It is unlikely that the US housing starts will return to basement levels of the late 2000's when lax mortgage standards in the early 2000's tanked the housing sector. As expected, with rising mortgage rates, we are beginning to see Existing Home inventories and new home inventories rebuild. At a minimum, a slower pace of home price growth is expected, and possibly price declines in some markets.

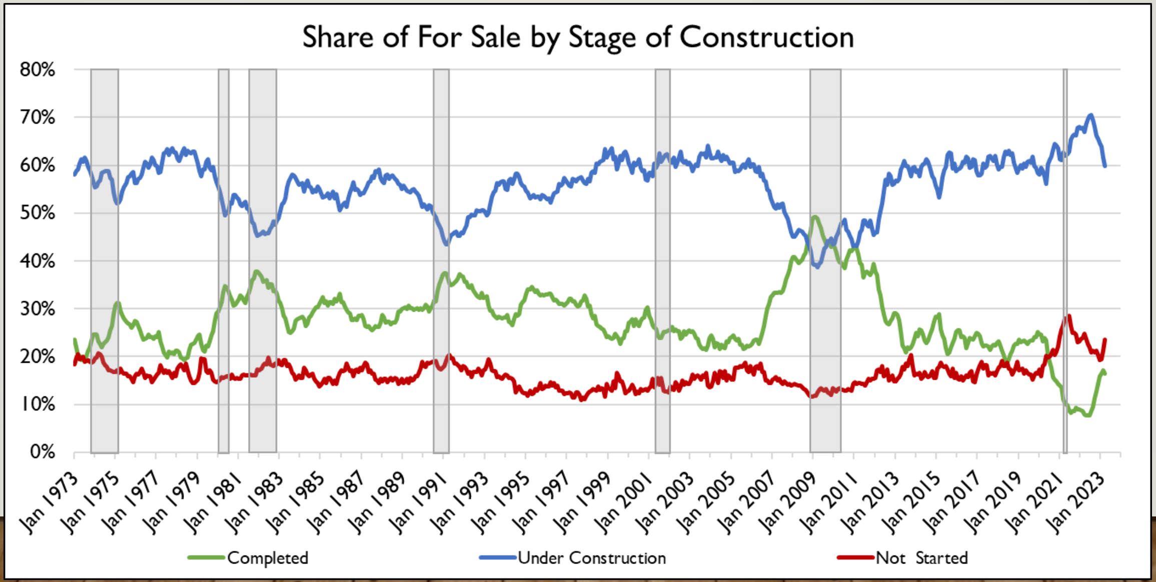


Data Source: U.S. Census Bureau, NAR

Charts & Analysis: WillSonn Advisory

BEHIND THE NUMBERS: PACE OF HOME SALES & INVENTORIES

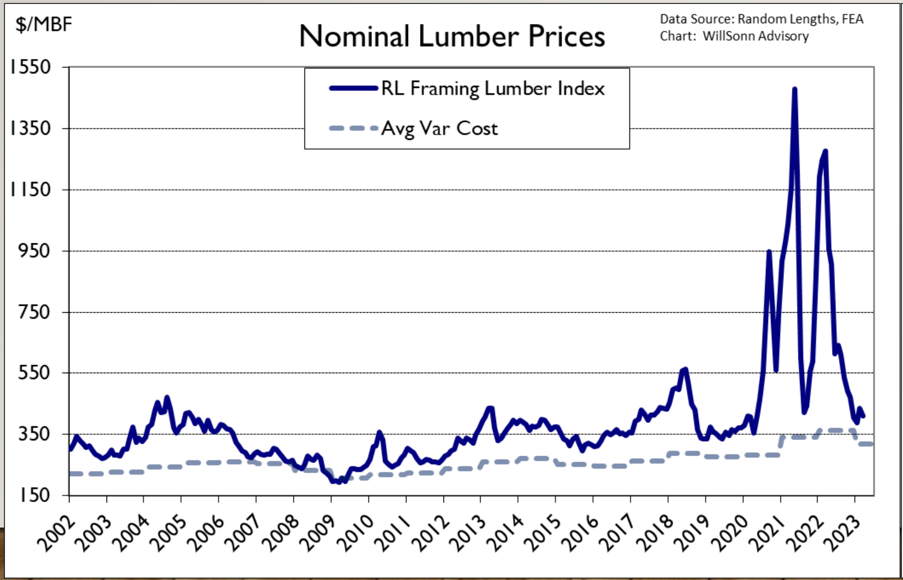
- **On the prior page, t**he inventory of New and Existing homes combines data from the National Association of Realtors ("NAR") which provides data for Existing home sales (both single and multi-family homes), and the U.S. Census Bureau, which provides data for New home sales (single family only). Inventory figures are not seasonally adjusted ("NSA"). Months Supply is derived from inventories and monthly sales volume, which are seasonally adjusted (Seasonally Adjusted Annual Rate, or "SAAR").
- **In the chart below**, I've plotted the share of New Homes for sale, by stage of construction. Also shown on the chart are the US recessions, in grey bars. What I notice in this chart is that a US recession is typically accompanied by a buildup (up to 30%+) in the share of Completed Homes for Sale and the longer the recession, the more pronounced the buildup of Completed Homes becomes. These patterns are typically mirrored by a decline in the share of homes Under Construction (as builders get stuck with more completed homes on hand). If we are entering a typical recession, Completed home shares will grow and Under Construction share will decline.
- Of the 425,000 New units for sale at the end of March 2023, only 16% were Completed (double the recent 47-year low of 8%), 60% were Under Construction, and 24% had Not Yet Started (down from its recent record of 29%).
- With the onset of the pandemic, and its impact on construction activity (slowed) and demand (heightened) we saw the inventory of homes Completed plummet, while the share of homes Not Yet Started climbed. Higher mortgage rates and building product prices in 2022 drove demand for new homes lower, allowing inventory of Completed homes to begin to recover.

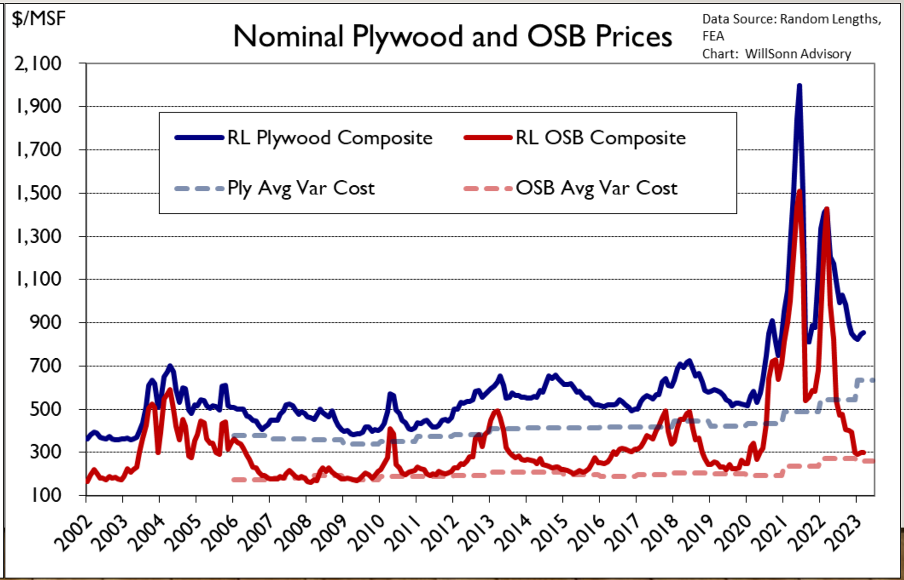


Data Source: U.S. Census Bureau, NAR
Charts & Analysis: WillSonn Advisory

WOOD PRODUCT PRICES

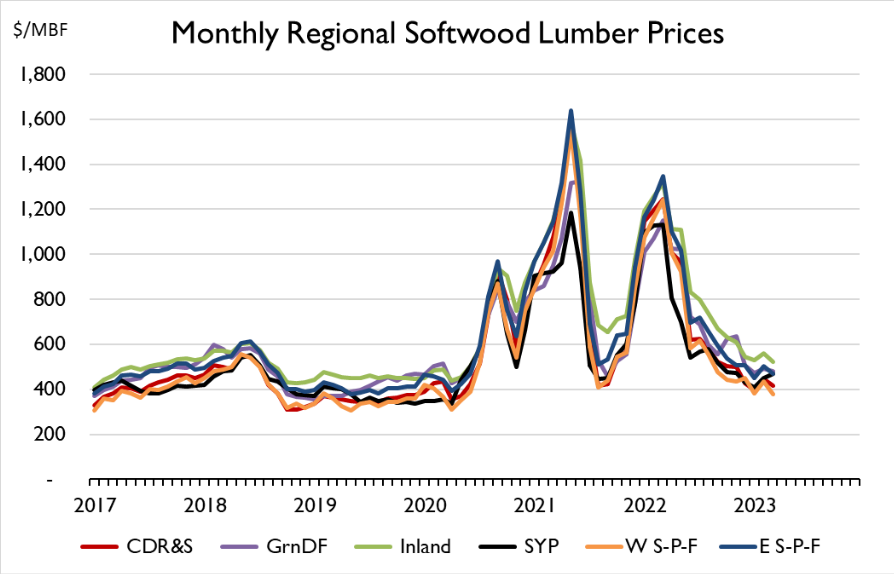
- **Recent Trends**: The Random Length Framing Lumber Composite Index in Q1 2023 lost another -10% from Q4 to register -47% below Full Year 2022 prices. Panel prices reversed course as well. Plywood pricing was down just -2% in Q1 from Q4, -24% below FY 2022. OSB prices sank another -10% in Q1 below Q4 prices, down -58% from FY 2022 prices. Only softwood plywood remains at or above its historical peaks prior to the pandemic, and well above its variable cost curve.
- **Explanation**: Extreme price volatility in building products materialized as manufacturers, construction and transportation sectors wrestled with periodic labor tightness, rising labor and volatile fuel costs, covid-related work absences and spot capacity closures for multiple quarters. As the nation navigated through new strains of the virus, changes in safety protocols, the "great resignation" and a desire to return to normalcy (including a return to the office), demand and supply for wood products has ebbed and flowed wildly.
- **Implication**: As predicted, when building material prices became excessive, some buyers delayed, downsized or abandoned projects, reducing demand and thus price. Historically, high prices would spur additional mill shifts, a surge in imports and substitution from non-wood materials, each of which have been muted through the Covid-19 pandemic. Rising interest rates also had a ripple effect.
- **Expectation**: As prices moderate and supply improves, builder and DIY demand should stabilize. It was hoped that vaccinations would also ease labor constraints, allowing for higher production and easing of transportation bottlenecks. But with multiple waves of covid variants, volatile fuel prices, elevated inflation and mortgage rates, and a depressed stock market, it's hard to predict if volatility is behind us.

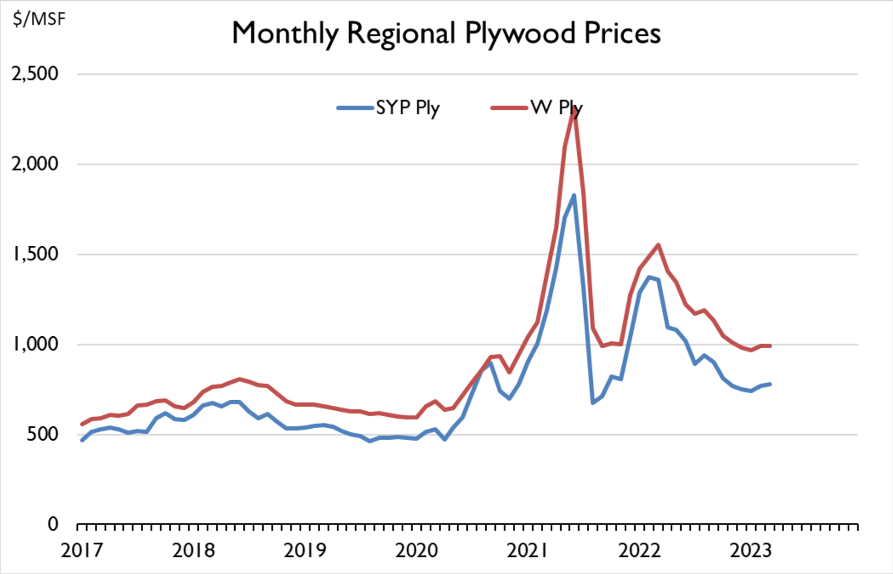




BEHIND THE NUMBERS: WOOD PRODUCT PRICES

- All regions continued the retreat in product prices during the first quarter of 2023.
- Regionally in Q1 2023 relative to Q4 2022
  - West Coast lumber mills saw a -12% decline in Coastal Dry Random & Stud ("CDR&S") prices and an -18% decline in Green Douglas-fir prices. CDR&S is now -67% below its March 2022 peak, Green DF is off -60%.
  - Inland sawmills saw prices retreat -10%, now -60% below its March 2022 peak.
  - Southern Yellow Pine ("SYP") sawmills saw prices dip just -4% in Q41, now -59% below its March 2022 peak.
  - Canadian components of the Random Lengths Framing Composite Index saw S-P-F prices lose -10% and -8% in the West and the East, respectively. Western SPF prices are off -69% in March, while Eastern SPF is off -65%, from their March 2022 peaks.
- First quarter plywood prices drifted lower in both regions, faring better than Lumber and OSB. Southern Plywood prices were down just -1% and Western Plywood was off just -3% in the first quarter relative to the fourth. The South is off -43% from its February peak, while western plywood is off -36% from its March 2022 peak.

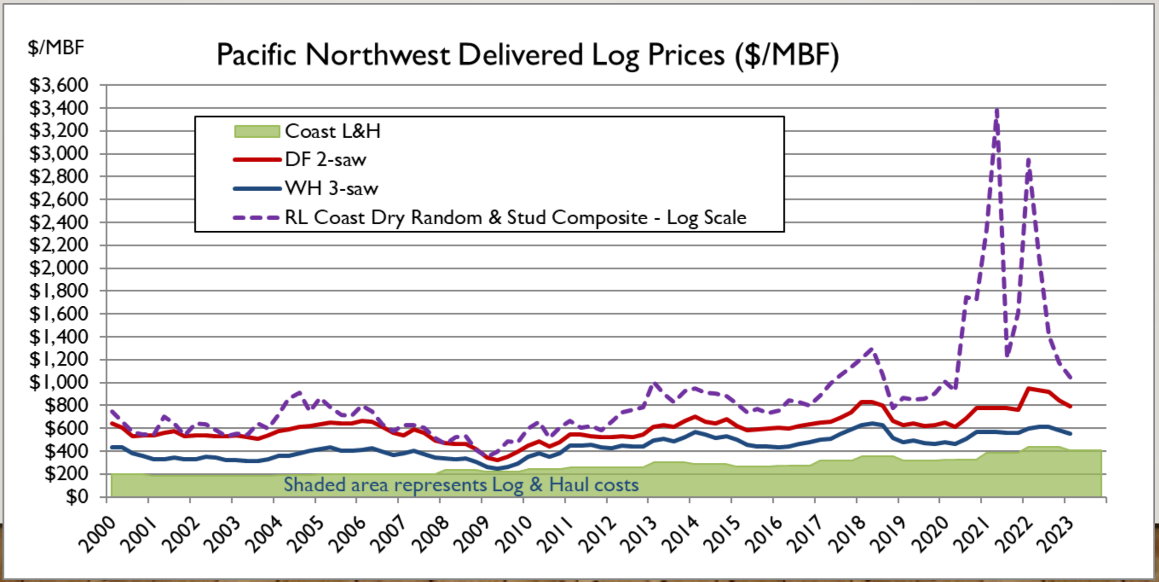




PNW LOG PRICES

- **Recent Trends**: Delivered log prices continued to ease in the first quarter with Douglas-fir 2saw prices off -6% (sitting -13% below 2022 levels) while western hemlock 3saw log prices were off -5% (7% below 2022 levels). Over the past 10 years, 1st quarter DF log prices have typically gained 5% while WH prices gained 3%, so this quarter's movement underperformed.
- After adjustments for changes in lumber recovery, the Random Lengths Coast Dry Random & Stud Composite price (on a log scale) lost another $133/MBF (11%) during the first quarter.
- **Explanation**: With demand outpacing production for much of 2022, western mill log throughput was only modestly higher. Extensive fires throughout the West in 2020 and 2021 resulted in extensive salvage operations into 2022. With weaker lumber prices and more normal logging conditions are now undercutting log sellers' pricing power, though log prices remain elevated.
- **Implication**: As a result, mills are now able to pull log prices lower as we begin 2023.
- **Expectation**: Over the past 10 years, second quarter DF 2saw log prices usually move lower, by -$10/MBF while WH 3saw typically see a gain of $17/MBF. Supply chains are improving, lumber prices remain under pressure, and Log & Haul costs are expected to moderate in 2023 due to reduced salvage and lower diesel prices. With four quarters of moderating lumber prices behind us, continued weakness in home construction anticipated, and a relatively mild fire season in 2023, the retreat in western log price is expected to continue.

Historically, with about a one-quarter lag, western lumber prices have been the primary driver in West Coast domestic log pricing, though changes in supply and export log prices do exert some influence.

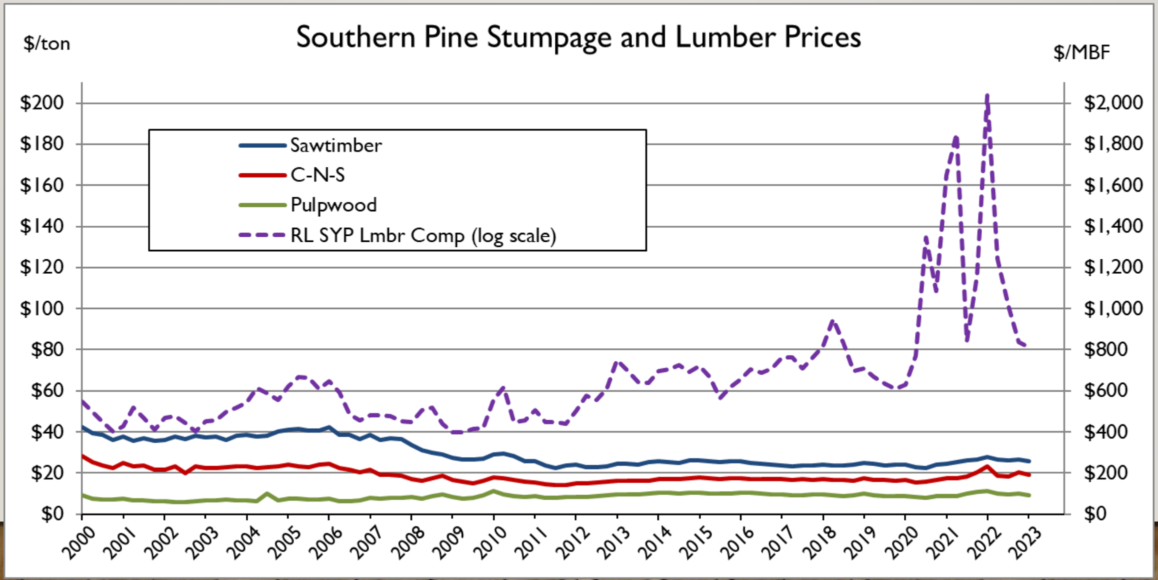


Data Source: Oregon DOF, WA DNR, Random Lengths, FEA, Log Lines

Charts & Analysis: WillSonn Advisory

SOUTHERN PINE LOG PRICES

- **Recent Trends:** First quarter Southern Yellow Pine stumpage prices moved lower in each grade, with the biggest movement in Chip-n-Saw. SYP Sawtimber prices edged down $0.74/ton in Q4 (-3%), Chip-n-saw stumpage prices pulled back $1.09/ton (-5%) and pine pulpwood gave up $0.49/ton (-5%). Relative to full year 2022, Q1 PST and CNS prices are down -4-5%, while PPW is off -8%.
- The Random Lengths SYP Lumber Composite, adjusted for lumber mill recovery, lost another $28/MBF, or -3% in Q1 '23 compared to Q4 '22, now registering 60% below full year 2022's prices (2022 was 7% below 2021 prices but nearly double 2019).
- **Explanation**: Q1 prices typically see prices move up a quarter to three quarters of a dollar per ton as Winter weather limits logging access, so 2022's Q1 retreat was atypical. Lower lumber prices, lackluster lumber demand and still-high diesel prices worked against stumpage values. Despite record growth in Southern lumber production and capacity, sawlogs remain plentiful in the US South.
- **Implication**: Moving in tandem, Sawtimber to Pulpwood price ratios inched up to 2.8:1 in Q1, within the 2.5:1 to 3.0:1 ratio of the last few years. With ratios below 4:1, landowners are less incented to grow sawtimber.
- **Expectation**: Q2 prices typically see prices move down a $0.33 to $0.76 per ton as Spring logging conditions improve logging access. Even though Q1 2022 Sawlog prices hit a 12-year high (and CNS a 15-year high), my longer-term view has not changed; SYP sawtimber prices will remain under pressure for an extended period as plentiful inventory on the stump, modest gains in housing starts, increased plantation productivity, and incremental improvements in mill recoveries all work against significant gains in southern log prices.



Data Source: Timber Mart South, Random Lengths, FEA

Charts & Analysis: WillSonn Advisory

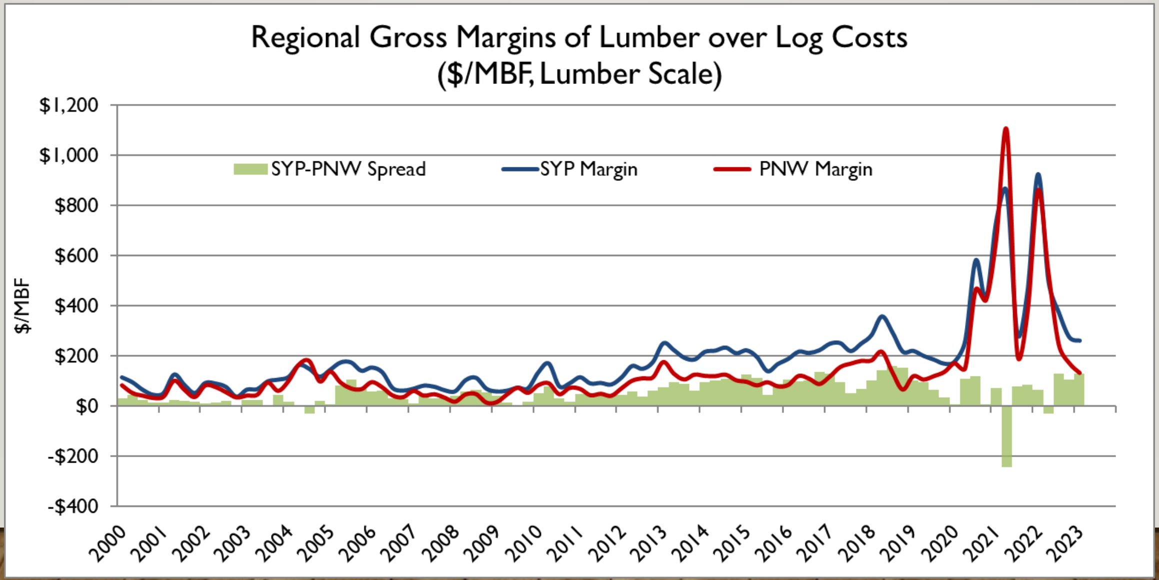
REGIONAL GROSS MARGINS

Sawmill Gross Margins (lumber price minus delivered raw material costs) in the Northwest and South were derived from the figures on the previous two pages. The difference in margins between the two regions is the "spread."

- **Recent Trend:** The gross margin spread between Southern and PNW sawmills remained at normal levels in Q1 at $129/MBF in favor of the South, up from $104/MBF in Q3. The $129/MBF spread compares to an average spread in 2020 of $60/MBF enjoyed by southern mills. Margins in volatile 2021 were at parity (on average). Gross margins contracted again this quarter, from $170/MBF to $131/MBF in the PNW, and from $273/MBF to $260/MBF in the South. Over the past 10 years, Southern sawmills have enjoyed gross margins over $200/MBF in 75% of the quarters, while PNW mill gross margins hit that mark only 25% of the time.
- **Explanation**: Since 2012, log export markets and declining Interior BC lumber production pushed PNW log prices to historical highs. In the South, persistent excess inventories of mature sawtimber on the stump have kept downward pressure on log prices, even as lumber prices improved. Both regions saw gross margins expand (twice!) during the pandemic-fueled run-ups in lumber prices.
- **Implication**: Manufacturing capital investments will continue to favor the US South as its margin advantage persists.
- **Expectation**: I expect the spread between the PNW and South to settle in the $50 to $100/MBF range when lumber markets settle down, in favor of the South. These spreads will persist until standing sawtimber inventories are worked down in the South over the next several years, or until expanded SYP lumber production pulls lumber prices down.

Data Sources: Timber-Mart South, Random Lengths, FEA, Oregon DOF, WA DNR

Chart & Analysis: WillSonn Advisory

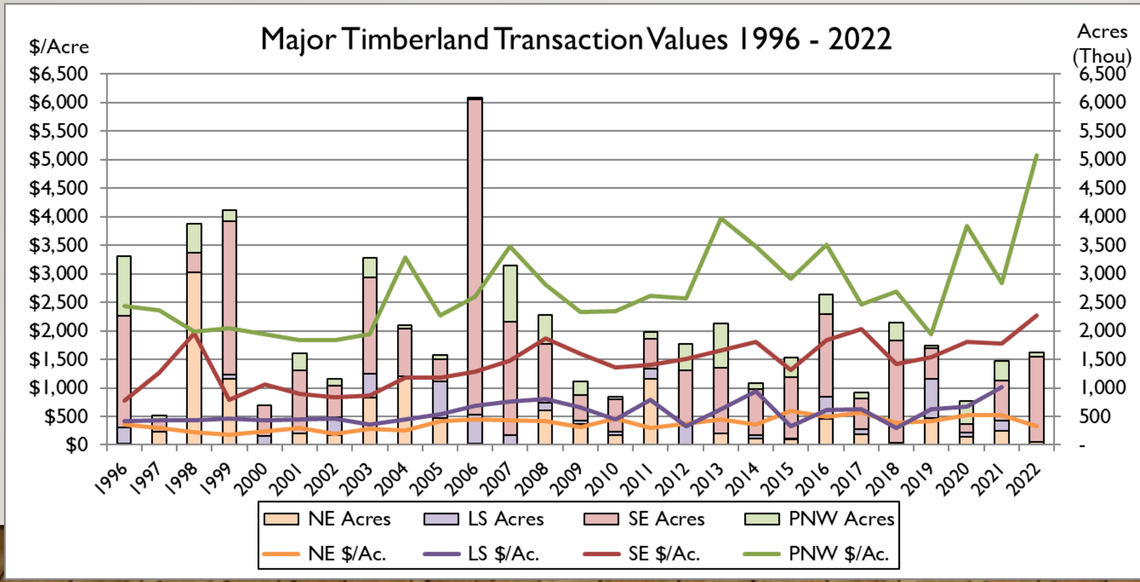


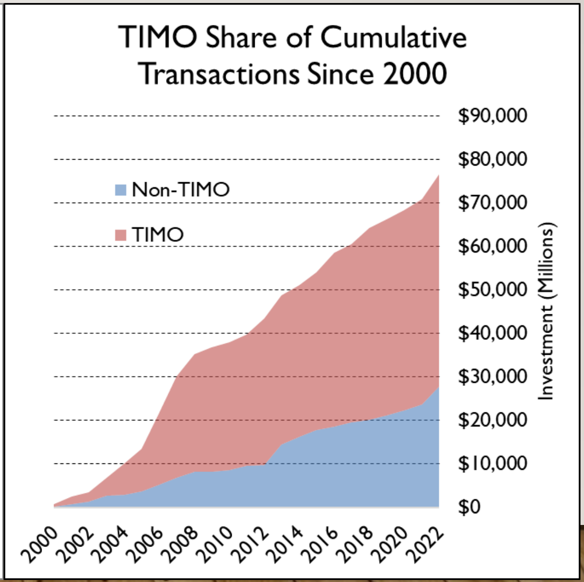
Assumptions: 67/33 weight of DF2saw and WH3saw in the PNW, and a 75/25 weight for S/T and CNS in the South (using 7.5 tons/MBF, along with FEA's estimates of Cut & Haul cost for S/T and CNS). All figures are lumber scale, and regional differences in lumber recovery factors are incorporated.

REGIONAL TIMBERLAND TRANSACTION VALUES

- **Recent Trends**: Timberland sales in 2022 totaled $5.66 billion on 3.36 million acres, with another +/- 310,000 acres sold at undisclosed values. In 2021, 1.55 million acres sold for a total of $2.71 billion. Southern and PNW timberland values hit new $/acre value records (in nominal dollars) while transactions in Appalachia (not shown) totaled 1.73 million acres, its highest ever, outpacing all other regions.
- By investment sector, Timberland Investment Management Organizations ("TIMOs") funded just 28% of the acquisitions in 2022, its second lowest share in 23 years. Since 2016, TIMO's have funded 56% of all transactions (by value). From 2013-15, TIMO buyers acquired 25% of US timberlands sold (by dollar), compared to 78% in the previous 13 years (2000-2012).
- **Explanation**: The REITs took advantage of record lumber prices and/or record PNW log revenues to fund acquisitions in the South. Blue Source, a new entrant focused on carbon values, funded most of the Appalachia and NE transactions along with its co-investors.
- **Implication**: Rising asset values during periods of rising interest rates narrow the implied equity risk premium being paid for timberlands. Since owning timberlands is obviously more risky than holding government bonds, there must be some other value component forcing valuations higher, such as Carbon plays or higher price expectations.
- **Expectation**: REITs may continue to reinvest outsized profits in timberlands if prices rebound again, but that seems unlikely in the near-term as housing languishes. Longer-term, higher borrowing costs may be offset by buyers pricing in Carbon sales to support valuations.

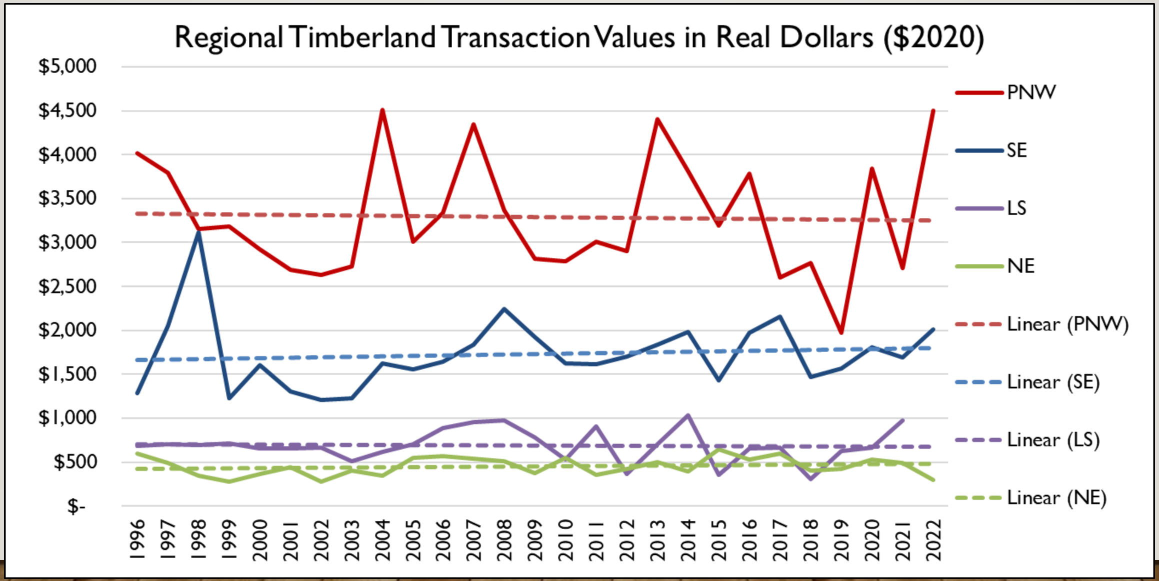
NE: Northeast LS: Lake States SE: Southeast PNW: Pacific Northwest Not Shown: Appalachia and Inland Northwest Data Source: TMS, TMR, Press Releases Charts & Analysis: WillSonn Advisory





BEHIND THE NUMBERS: TRANSACTION VALUES IN REAL $'S

- In real dollar terms, the PNW trendline has drifted lower (~$80/acre) over the past 25 years, equivalent to a negative compound annual growth rate ("CAGR") of -0.1%
  - Some transactions in recent years have included lands in lower-value subregions. In addition, modest gains in productivity were likely offset by increased regulation limiting harvestable acres and/or volume.
  - The 2022 value shown on the previous page reflected two transactions, likely understating the downward trend.
- In the South, the real dollar trendline value has increased ~$130/acre over the past 26 years, a positive CAGR of 0.29%
  - Private softwood growing stock volumes are 32% higher (USFS: 2017 vs 1997), accounting for much of the increase in value. In addition, assumed near-term recoveries in stumpage prices have typified underwriting for years, despite evidence to the contrary.
- The Lake States real dollar timberland value trend lost ~$30/acre (CAGR of -0.19%) while the value trend in the Northeast gained ~$60/acre (a CAGR of 0.5%).
  - Both of these regions saw significant pulp mill contractions and modest gains in standing inventory, yet took different trajectories.
  - Conservation easements have been prolific in the Lake States, a possible factor as encumbered lands are subsequently sold.



SECTION 2: DEEPER DIVE

TRENDS IN NAHB'S SINGLE-FAMILY PRICE AND COST SURVEY

NAHB'S SINGLE-FAMILY PRICE & COST BREAKDOWN

- Every two or three years, the National Association of Home Builders ("NAHB") conducts a survey of homebuilders, and publishes the results of their survey.
  - While NAHB discusses some comparisons to prior surveys, there is little discussion of longer-term trends.
  - NAHB also does not make any adjustments for inflation.
- WillSonn Advisory has been keeping a running tally of the results since 1998.
  - Thankfully, NAHB has largely maintained the format of the survey results, allowing for survey-to-survey comparisons.
  - However, from survey to survey, survey respondents often change, which can weaken comparability.
- In addition to NAHB data, this Deeper Dive also drew data from the Federal Reserve (CPI-U data) as well as the US Census Bureau (data regarding home size, new home sale price, and single-family construction expenditures).
- The most recent NAHB release, presenting 2022 survey responses, appears to the right.
  - The full press release can be found at this web address: [special-study-cost-of-constructing-a-home-2022-february-2023.pdf (nahb.org)]

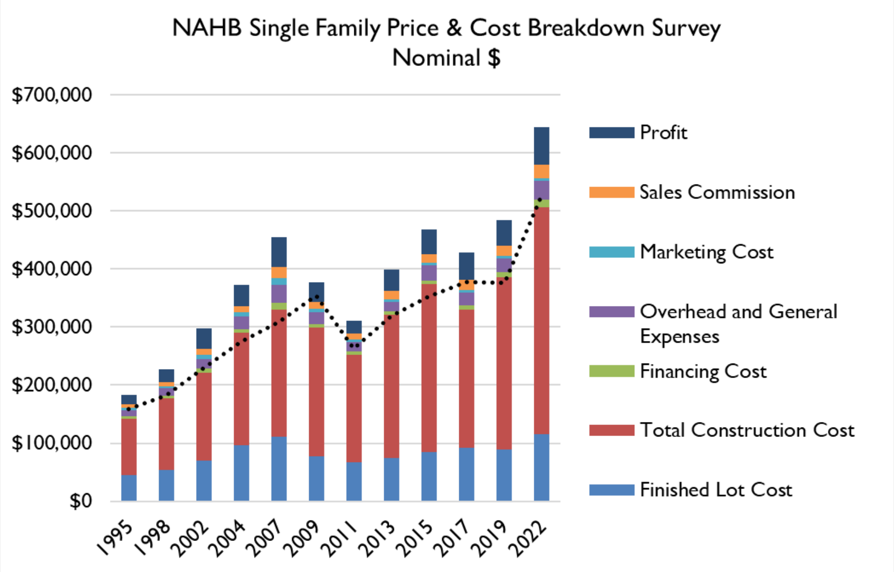
Table 1. SINGLE-FAMILY PRICE AND COST BREAKDOWNS
2022 National Results

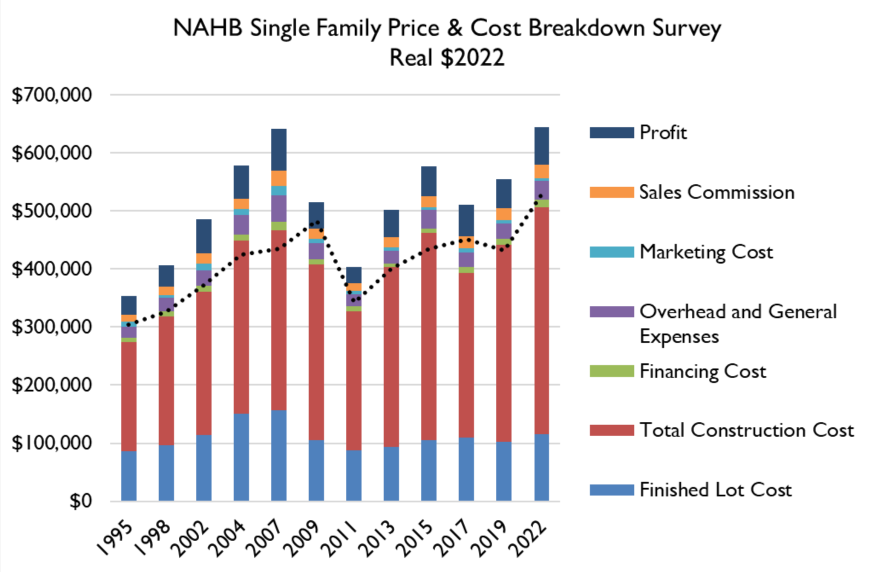
Average Lot Size:		17,218
Average Finished Area:		2,561
I. Sale Price Breakdown	**Average**	**Share of Price**
A. Finished Lot Cost (including financing cost)	$114,622	17.8%
B. Total Construction Cost	$392,241	60.8%
C. Financing Cost	$12,192	1.9%
D. Overhead and General Expenses	$32,979	5.1%
E. Marketing Cost	$4,268	0.7%
F. Sales Commission	$23,080	3.6%
G. Profit	$65,369	10.1%
Total Sales Price	$644,750	100.0%
II. Construction Cost Breakdown	**Average**	**Share of Construction Cost**
I. Site Work (sum of A to E)	**$29,193**	**7.4%**
A. Building Permit Fees	$8,292	2.1%
B. Impact Fee	$5,208	1.3%
C. Water & Sewer Fees Inspections	$5,800	1.5%
D. Architecture, Engineering	$4,724	1.2%
E. Other	$5,169	1.3%
II. Foundations (sum of F to G)	**$43,086**	**11.0%**
F. Excavation, Foundation, Concrete, Retaining walls, and Backfill	$39,731	10.1%
G. Other	$3,355	0.9%
III. Framing (sum of H to L)	**$80,280**	**20.5%**
H. Framing (including roof)	$60,831	15.5%
I. Trusses (if not included above)	$11,479	2.9%
J. Sheathing (if not included above)	$5,383	1.4%
K. General Metal, Steel	$1,168	0.3%
L. Other	$1,419	0.4%
IV. Exterior Finishes (sum of M to P)	**$46,108**	**11.8%**
M. Exterior Wall Finish	$19,746	5.0%
N. Roofing	$11,496	2.9%
O. Windows and Doors (including garage door)	$13,158	3.4%
P. Other	$1,709	0.4%
V. Major Systems Rough-ins (sum of Q to T)	**$70,149**	**17.9%**
Q. Plumbing (except fixtures)	$22,706	5.8%
R. Electrical (except fixtures)	$23,892	6.1%
S. HVAC	$21,845	5.6%
T. Other	$1,707	0.4%
VI. Interior Finishes (sum of U to AE)	**$94,300**	**24.0%**
U. Insulation	$6,530	1.7%
V. Drywall	$13,184	3.4%
W. Interior Trims, Doors, and Mirrors	$12,727	3.2%
X. Painting	$8,793	2.2%
Y. Lighting	$4,502	1.1%
Z. Cabinets, Countertops	$17,775	4.5%
AA. Appliances	$6,263	1.6%
AB. Flooring	$13,019	3.3%
AC. Plumbing Fixtures	$5,166	1.3%
AD. Fireplace	$1,608	0.4%
AE. Other	$4,733	1.2%
VII. Final Steps (sum of AF to AJ)	**$23,065**	**5.9%**
AF. Landscaping	$9,123	2.3%
AG. Outdoor Structures (deck, patio, porches)	$2,178	0.6%
AH. Driveway	$8,775	2.2%
AI. Clean Up	$2,280	0.6%
AJ. Other	$709	0.2%
VIII. Other	**$6,059**	**1.5%**
Total	**$392,241**	**100.0%**

Source: NAHB Single Family Price & Cost Survey

NAHB PRICE BREAKDOWN

- The figures in the chart on the left present NAHB data in Nominal dollars, along with the US Census Bureau average sale price of new homes sold in the US for the same periods.
  - Since 1995, each component of the sale price reported in the surveys increased at a rate of 4-5% per annum, except Marketing Costs, which were essentially flat.
  - This compares to inflation, which increased at a Compound Annual Growth Rate ("CAGR") of 2.4%, so new home sale prices have risen at about double the rate of inflation over the past 27 years.
- The dotted line, representing US Census Bureau data on new home sale prices, has followed a similar path, though noticeably lower.
  - This suggests that NAHB survey participants report their sales and costs on homes that are somewhat more expensive than the national average.
- The bottom Right chart shows the same data, in Real Dollar terms (base year 2022).
  - In real dollar terms, Sales Price are actually quite similar to 2007 values, right at the peak prior to the Great Recession.
  - Recall that the Great Recession was triggered by a sub-prime mortgage collapse and a subsequent decline in home values.





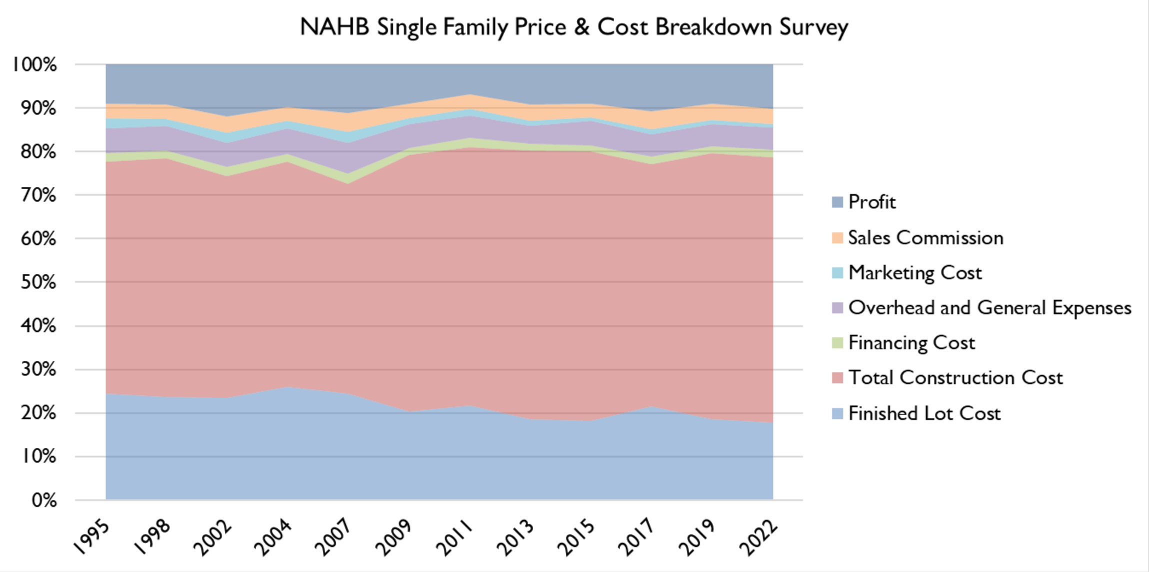
Source: NAHB Single Family Price & Cost Survey, Federal Reserve Analysis: WillSonn Advisory, LLC

SHARE OF SALES PRICE

- As a percentage of Total Sales Costs:
  - Total Construction Cost increased from 54% to 61%.
  - Finished Lot cost declined from 24% to 18%.
  - All other components maintained their share of total sale price +/- 1%, including profit, which ranged from 9-12% in all but one year (2011).
  - Proportionately, Marketing costs lost the greatest share of sales price, as it declined from 2% to less than 1% over the period examined.

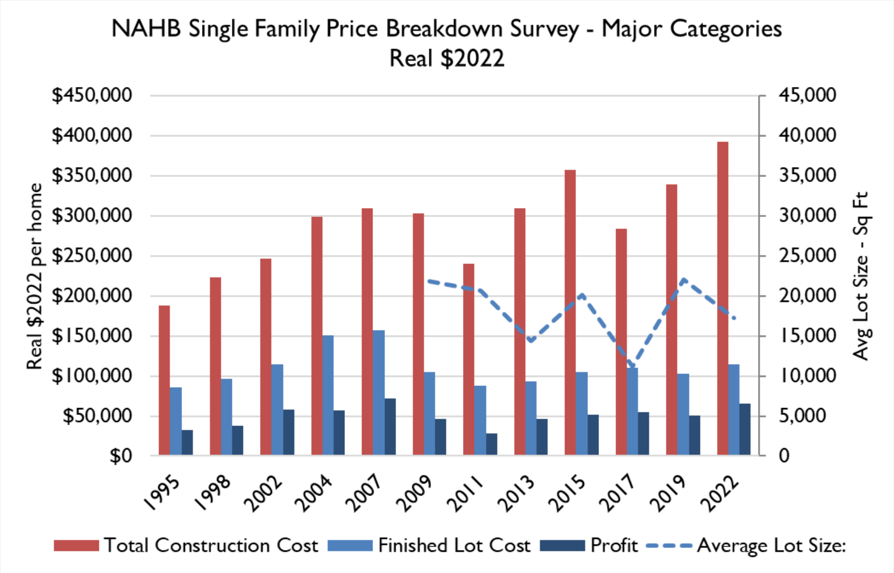
Source: NAHB Single Family Price & Cost Survey

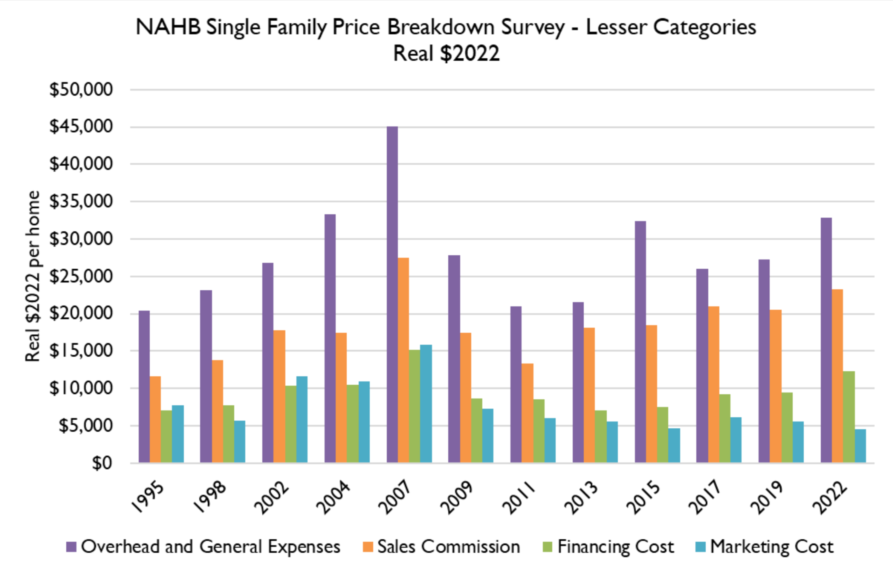
Analysis: WillSonn Advisory, LLC



NAHB PRICE BREAKDOWN

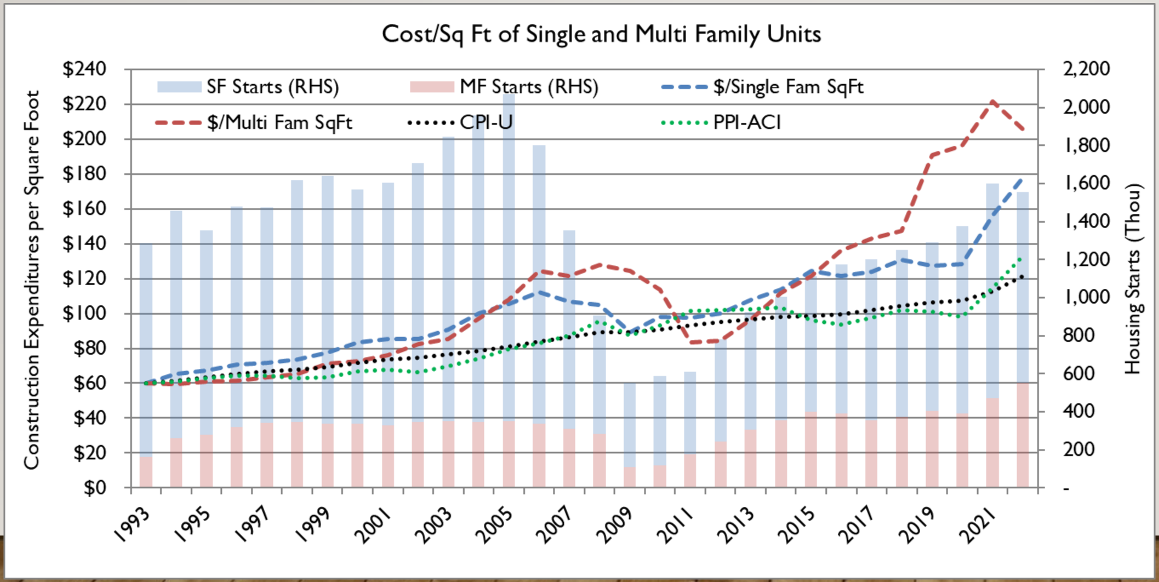
- The charts below make it a bit easier to see how each of the components of sales price has changed over time, in Real Dollar terms.
  - The left-hand chart shows the major cost components, while the right-hand chart shows the lesser cost components.
- Also shown on the left-hand chart, the average Finished Lot size for the 2009 through 2022 surveys.
  - Over the past decade, Finished Lot size has varied, while Finished Lot costs have remained relatively flat (in real dollar terms).
  - There was very little correlation between lot size and lot value (R^2=.05).
- Note that Financing costs peaked in 2007, right before the housing bust, and were on the rise again in 2022 as interest rates were just beginning to increase.

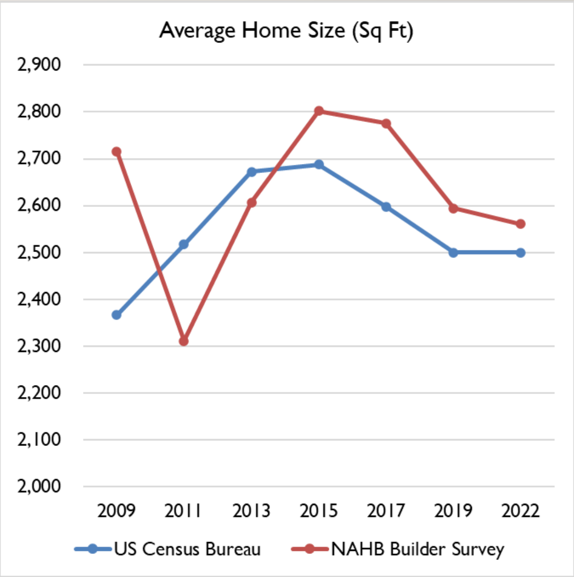




CONSTRUCTION COSTS PER SQUARE FOOT

- WillSonn Advisory keeps a running tally of average construction costs per square foot for Single and Multi Family home construction.
  - These estimates incorporate data from Private Construction Expenditures Put in Place, Construction Time, and Composition Purpose and Design reports, each of which are compiled by the US Census Bureau.
  - As with the NAHB's Construction Cost Breakdown, Census Bureau data excludes the cost of land in their Construction Expenditure figures.
- Single Family cost/sq ft, depicted by the dashed blue line in the chart below, was multiplied by the percentages reported by NAHB, for the charts on the pages that follow.
  - Applying NAHB cost percentages to US Census Bureau data was done to mitigate inconsistencies in the NAHB data due to discrepancies in home sizes (see right-hand chart) and changes in survey participants.





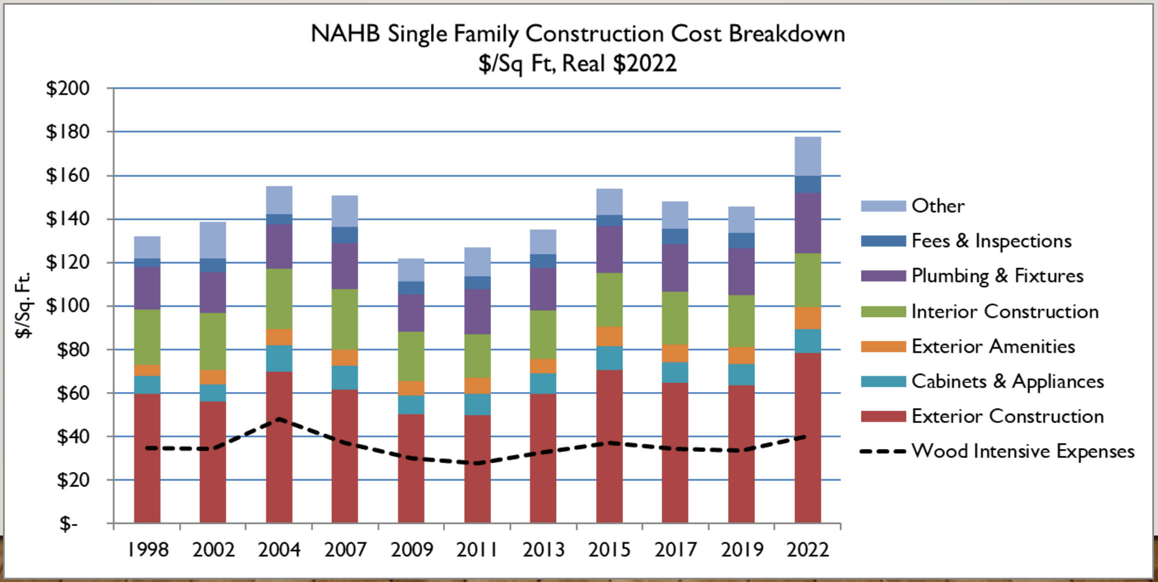
Source: NAHB Single Family Price & Cost Survey, US Census Bureau
Analysis: WillSonn Advisory, LLC

NAHB CONSTRUCTION COST BREAKDOWN

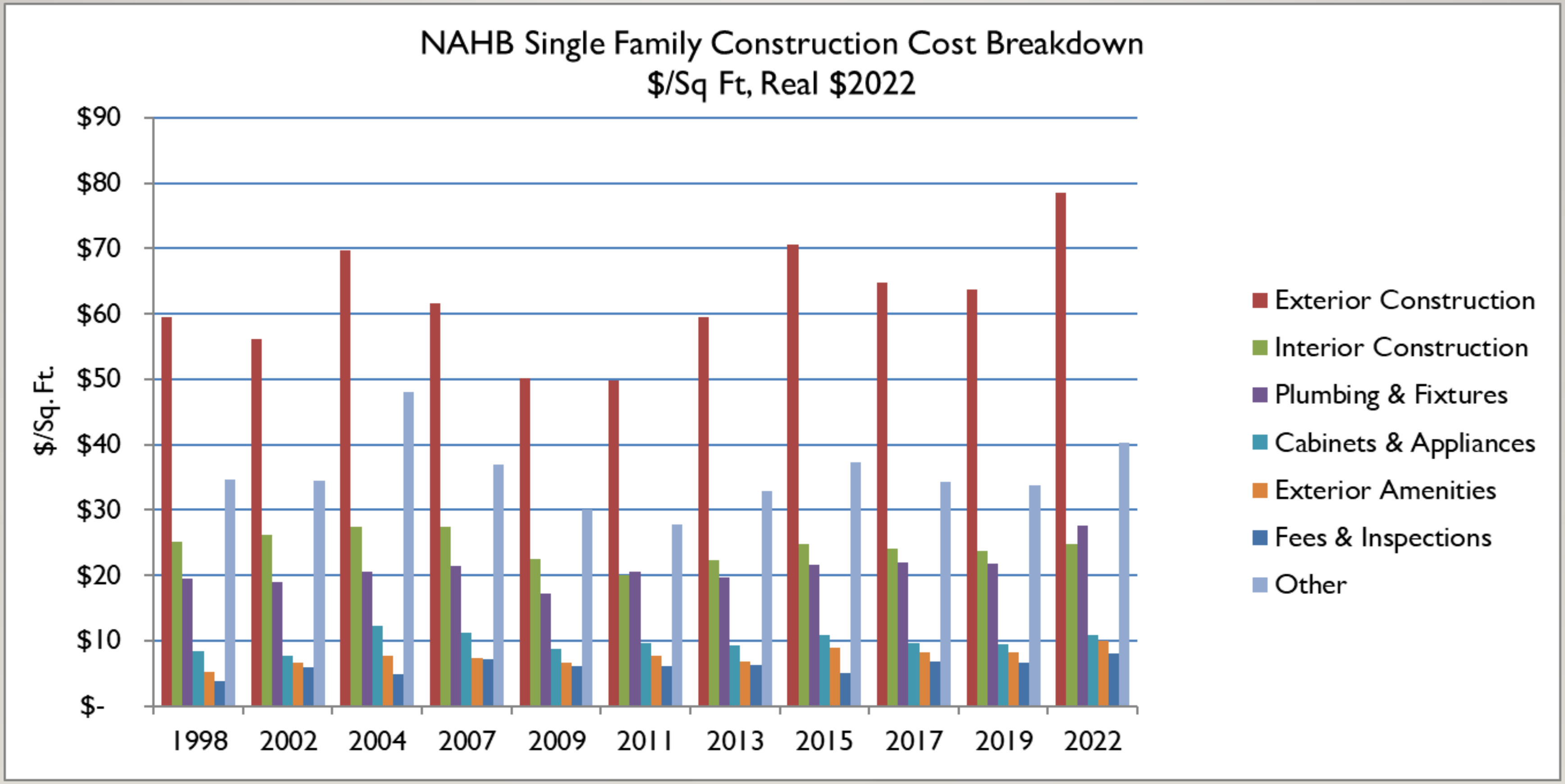
- In Real Dollar terms, 2022 certainly had the highest construction costs.
  - However, the wood-intensive expenses (framing, stairs, trusses, sheathing, cabinets, decks) did not increase as much as might be expected.
  - Overall, in real dollar terms, between 1998 and 2022, the total cost of construction increased at a Real CAGR of 1.3%, while wood-intensive expenses (represented by the dashed black line) increased at a Real CAGR of just 0.6%.
- The fastest growing construction cost component was Fees and Inspections (which include burgeoning "impact fees"), with a Real CAGR of 3.1%.
  - Exterior Amenities costs rose the second fastest, at a 2.7% Real CAGR.
  - Interior Construction Costs were virtually flat, with a CAGR of -0.1% in real dollar terms.

Source: NAHB Single Family Price & Cost Survey, US Census Bureau

Analysis: WillSonn Advisory, LLC



This chart makes it a bit easier to see how each of the component categories of Construction Costs has changed over time, in Real Dollar terms.



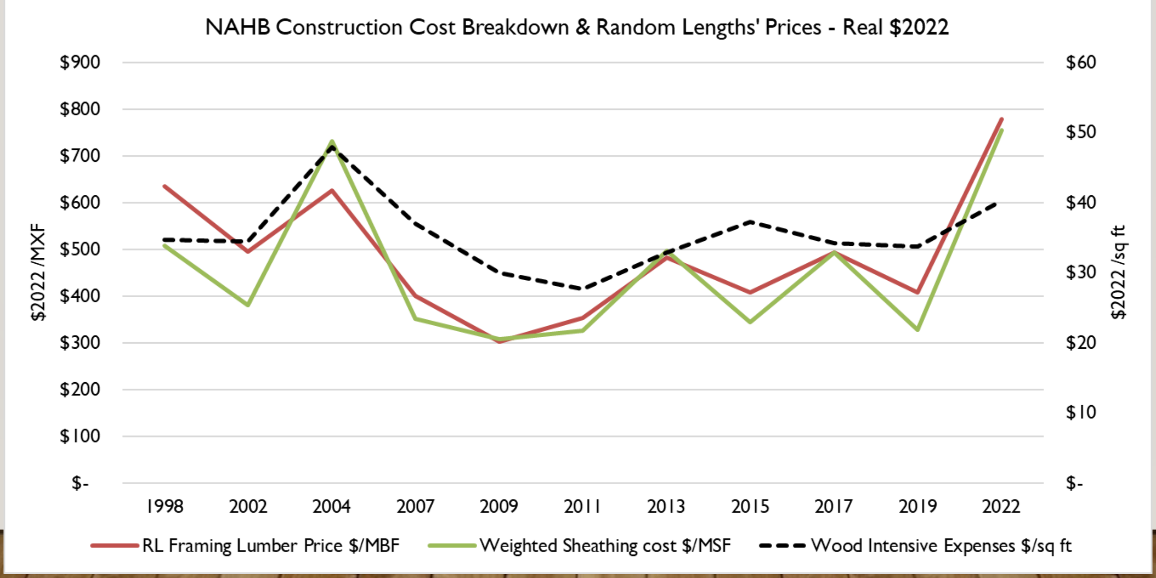
Source: NAHB Single Family Price & Cost Survey, US Census Bureau
Analysis: WillSonn Advisory, LLC

NAHB CONSTRUCTION COSTS VS. RANDOM LENGTHS

- This chart compares the Construction Costs for wood-intensive components of Construction Costs from NAHB's Construction Cost Survey, against Random Lengths' Price Indices for lumber and structural panels.
- The trends are generally consistent, though NAHB's wood-intensive construction expenses appear to be less volatile than the Random Length reported prices.
  - This may be due to other cost components included in the NAHB data (such as labor expense).
  - There may also be some lags in the NAHB data as home builders' wood costs would have to flow through the distribution channels, versus Random Lengths' spot mill prices.

Source: NAHB Single Family Price & Cost Survey, Random Lengths, FEA

Analysis: WillSonn Advisory, LLC



SECTION 3:

IN CASE YOU MISSED IT

AMERICA'S MOST PROLIFIC LOGGER RECASTS ITSELF AS ENVIRONMENTAL DO-GOODER

Story by Ryan Dezember *April 17, 2023* *The Wall Street Journal*

An excerpt from this front-page article.

KIBBY TOWNSHIP, Maine—Weyerhaeuser Co. has cut down more trees than any other American company since its founder started logging before the Civil War. Environmentalists have long treated it as an enemy.

Now, the new math of carbon emissions is enabling the lumber producer to cast itself as something quite different: a force for environmental good.

Its 10.6 million acres of U.S. timberland act as a giant sponge for carbon dioxide, which Weyerhaeuser says more than compensates for the greenhouse gases it emits by felling trees, sawing them into lumber and distributing wood products.

Although Weyerhaeuser is cutting down as many trees as ever and plans to increase lumber production 5% in the next few years, it says its net carbon footprint is negative—so much so that it is offering carbon dioxide storage capacity to other companies. Weyerhaeuser expects a new unit dedicated to helping other firms offset their emissions to generate $100 million a year in profit by the end of 2025.

"I don't think there are many companies in the world with a better environmental story than Weyerhaeuser," said Devin Stockfish, chief executive officer of the Seattle-based company. "The moment is really ripe for us."

No one debates that trees absorb carbon-dioxide as they grow. There is less agreement about whether using trees to offset corporate emissions actually benefits the environment.

Corporate executives and scientists who have criticized the carbon-offset market say the offsets sold by timberland owners allow other companies to pay a relatively small price to avoid reducing their own emissions. They also say forest-preservation pacts that produce offsets often don't substantially change logging practices, which means they essentially pay timberland owners for behaving as they would anyway.

EXCERPT OF THE WSJ ARTICLE APRIL 17, 2023

Lately, potential buyers have begun demanding that offsets represent actual reductions in planned tree-cutting, and sellers want higher prices to justify lost logging income. Deal-making has slowed.

“The vast majority who are signing up are doing business as usual,” said William Sonnenfeld, a forestry consultant who worked for three decades for timberland owners and investors. “Most people game the system.”

Russell Hagen, who oversees the climate unit as Weyerhaeuser’s chief development officer, said the company is “very focused on making sure that any project we bring to the market is the highest quality, meets the highest standards.”

Weyerhaeuser is America’s largest private landowner. Its timberlands range from expanses of Douglas fir in the Pacific Northwest to pine plantations across the South to the North Maine Woods. Altogether, its trees cover an area roughly twice the size of New Jersey.

Weyerhaeuser says those trees remove about 14 million metric tons of carbon dioxide from the atmosphere each year. It says another 10 million metric tons are held in timberlands owned by others that supply its mills, and in the logs it sells to others.

Weyerhaeuser produces about 950,000 miles of lumber a year and more than enough wood panels to cover Manhattan four sheets thick. Even though lumber doesn’t continue absorbing carbon dioxide, the company takes credit for another 11 million tons of carbon held in those wood products. It reasons that carbon continues to be stored in the lumber after it goes into houses and other structures, which wouldn’t be the case if a tree fell and decayed on the forest floor.

Taking credit for carbon in harvested wood, manufactured products and on timberlands owned by others is inconsistent with guidelines other companies use for their emissions accounting. Ara Erickson, Weyerhaeuser’s vice president of corporate sustainability, said the company is pushing its case with the organizations that set carbon standards.

The Wall Street generally prohibits full reproduction of its news articles. Ryan Dezember (ryan.dezember@wsj.com) has provided this link to the full article (this excerpt is ~40% of the full article): https://www.wsj.com/articles/weyerhaeuser-logging-carbon-emissions-offset-market-environment-76850c01?st=miynj088tearqg9&reflink=desktopwebshare_permalink

SECTION 4:

ABOUT WILLSONN ADVISORY, LLC

CRITICAL EXPERIENCE FOR CRITICAL ENDEAVORS

WillSonn Advisory brings senior management experience, across multiple sectors of the wood products industry, with expertise in leading an array of strategic initiatives.

Sectors

- Timber, Manufacturing, Bioenergy
- Private Industry & Institutional Investment
- Corporate Lending
- Consulting
- Domestic and International

Experience

- Mergers, Acquisitions & Divestitures
- Timberland Operations
- Finance & Planning, Financial Reporting
- Loan Origination & Underwriting
- Operations Support

Expertise

- Strategic Planning
- Asset Valuations and Due Diligence
- Project Management
- Contract Negotiations
- Budgeting & Forecasting

WILLSONN ADVISORY SERVICES

- Timberland & Mill Valuations
- Acquisition "Post-Mortem" Audits
- Conversion of Acquisition Pro Forma to Lender Financial Projections
- Acquisition and Operational Due Diligence
- Development of Company Enterprise Valuations
- Incorporating Economic Forecasts into Business Plans

Business Assessments & Due Diligence Services

- Acquisition and Divestiture Process Management
- Conduct Regional or Global Market Studies
- Plan and Oversee Inventory & GIS Projects and/or Audits
- Independent Review of Harvest Flow Projections and Processes
- Prepare Offering Memorandums and Prospectuses

Project Management Services

- Fiber/Log Supply Agreements
- Purchase & Sale Agreements
- Timber Deeds and Leases
- Conservation Easements & Carbon Projects
- Service and Offtake Agreements
- Joint Ventures & Partnerships
- Contract Negotiating Strategies

Contract Structuring and Negotiation Services

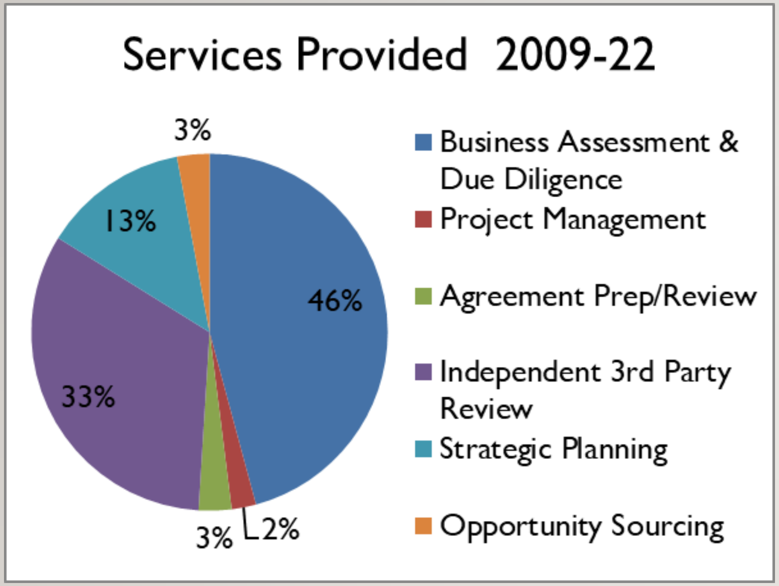
- Strategic Plan Process Design, Facilitation and Documentation
- Company Specific Price, Supply and/or Demand Forecast Development
- Contingency Plan Development and Monitoring
- Financial Planning and Capital Restructuring
- Work-out Strategy Development
- Capital Investment Assessments

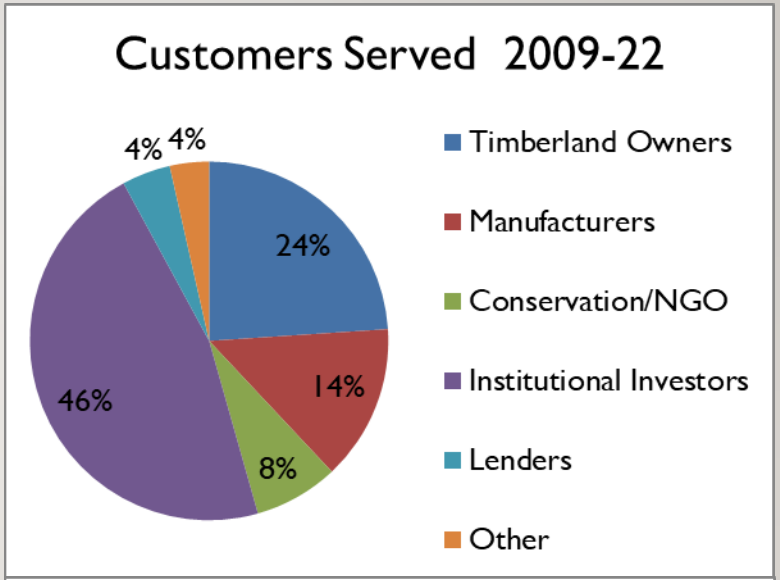
Strategic Planning & Business Restructuring Services

- Validate Acquisition Valuations & Due Diligence Procedures
- Evaluate Existing or Proposed Agreements or Easements
- Interpret Annual Management Plans & Appraisals
- Examine Proposed Transfers of Ownership
- Review Divestiture Timing & Strategies
- Track Investment Performance

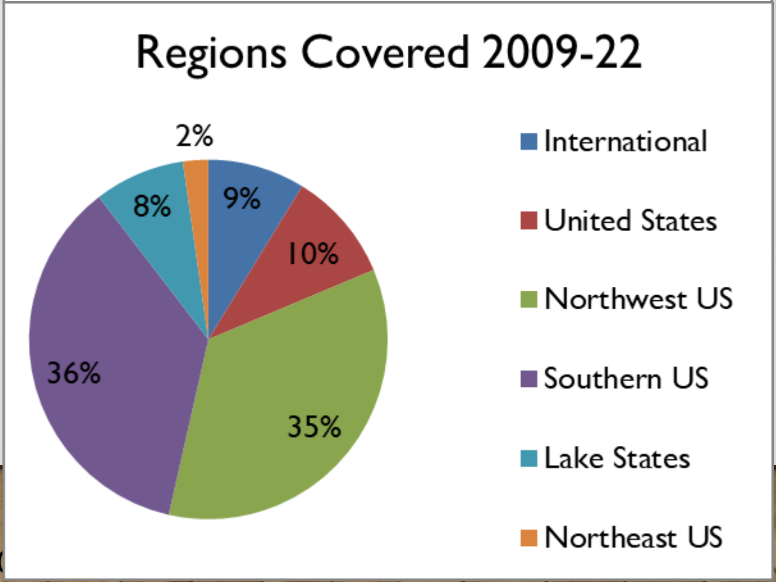
Institutional Investor Services

ENGAGEMENT PROFILES





Since 2009, Will Sonnenfeld has provided a broad range of consulting services to dozens of clients across the full spectrum of industry sectors, in all regions of the US and abroad.



I look forward to receiving any comments or questions you may have and would welcome the opportunity to serve your consulting needs.

William E. Sonnenfeld, Principal

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