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As always, very valuable information and astute analysis from Will. Regards, Rich

Please find attached the Market Trend Update for the fourth quarter of 2018. It was a roller-coaster year, to be sure, with lumber, plywood and northwest log prices reaching new highs mid-year, then plummeting in the last quarter. Meanwhile, southern log prices were flat, and timberland prices were mostly lower, on average.

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President, Forest Products Society; President, WoodEMA i.a.



Market Trends

4th Quarter, 2018

Perspectives on the latest market trends and indices impacting the Timber and Wood Products sectors, compliments of WillSonn Advisory, LLC



Q4 2018 Highlights

Market Trends

- Builder sentiment retreats and construction expenditures slow (page 4)
- Affordability continues to drift lower as interest rates move up (page 5)
- 4th Quarter Housing Starts disappoint, pulling YTD gains down (page 6)
- Lumber, Plywood and OSB prices take double digit dives in Q4 (page 7)
- PNW Log Prices reverse course Southern log prices drift sideways (page 8-9)
- Mill margins narrow, but South advantage holds at \$149/MBF in Q4 (page 10)
- Timberland sales top 2 million acres but “B&C” properties cap values (page 11)

About WillSonn Advisory



Section 1: Latest Trends



Builder Sentiment & Private Residential Expenditures

NAHB's **Homebuilder Market Index (HMI)** and **Remodeling Market Index (RMI)** are measures of home builder and remodeling contractor sentiment.

The HMI took a nose dive in the late 4th quarter, posting a score of 56 in December, down from a peak of 74 in December 2017, and a level not seen since May, 2015. The 6-month rolling average registered 64, down 5 points from last quarter. Economists at NAHB believe that declining affordability is the culprit, particularly in regions of the country with high home prices, like the West.

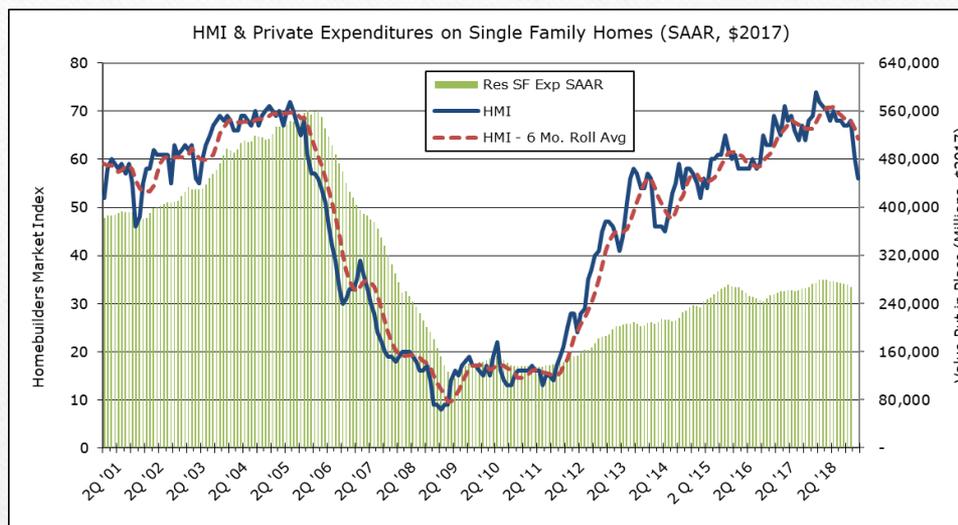
The RMI slipped to 57 in Q4. As reported in the first quarter, the NAHB data suggests that average home tenure has increased from ~6 years (from 1987 through 2008) to ~10 years in three of the last four survey years.

Private Expenditures on Single Family Housing (in constant dollars, SAAR) has improved at a 4.3% pace YTD in 2018, a modest improvement over the 3.8% registered in 2017. Gains in **Private Residential Improvement Expenditures YTD** have moderated, now just 4.3% over 2017 levels, well off the torrid gains of 18.0% posted in 2017.

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). While a reading over 50 indicates a prevailing positive view of current and future conditions, it says nothing about the proportion in the neutral camp.

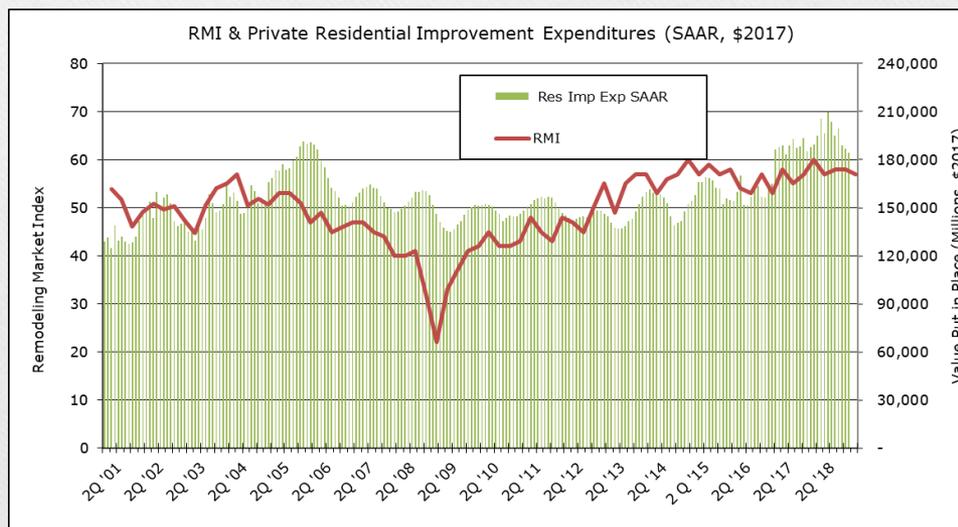
The Seasonally Adjusted Annual Rate expenditure figures in both charts were deflated using the US Census Bureau's "Fixed" Construction Price Index which adjusts for both inflation and home size.

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

Charts & Analysis: WillSonn Advisory



Affordability

The National Association of Realtors (NAR) Affordability Index (top chart) made its typical Fall rise, registering 147 in September and October, the lowest October reading since 2008. The index then dipped to 144 in November. Also depicted in the top chart is my measure of new home affordability, one that incorporates the transaction price of new homes (rather than the listing price of existing homes, as used by NAR).

Using NAR's family income and interest rates and Census Bureau median new home sale prices, I calculate a more modest **New Home Affordability Index of 117 in Q3 2018**. New Home affordability has drifted lower over the past two years due primarily to rising mortgage rates.

In the bottom chart, I've displayed the movement in the three components of the NAR Affordability Index – home price, mortgage rates and family income. For the first eleven months of 2018, compared to all of 2017, home prices are up 5.0% and Mortgage rates are up 11.8%, but Median Family Income is up just 3.5% resulting in a lower HAI, down 6.8% from last year. Holding home price and income steady, **a 50 basis point change in mortgage rates reduces the Affordability Index about 10 points.**

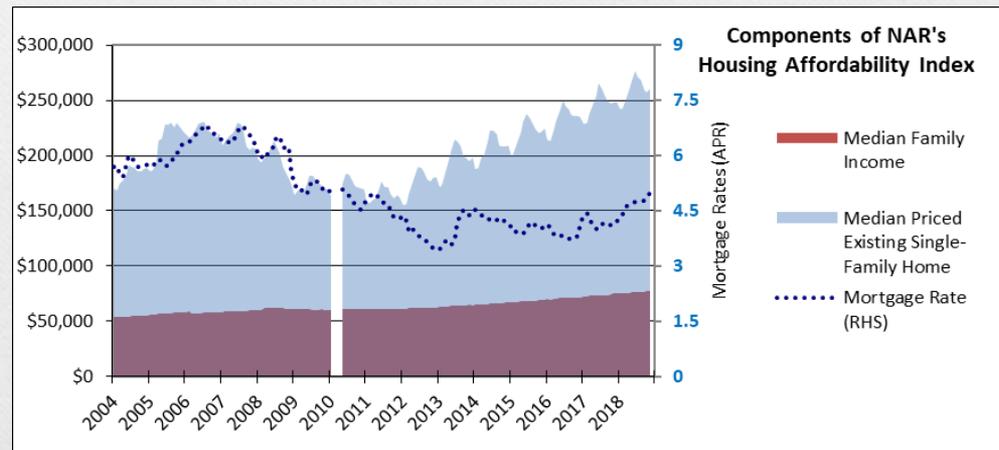
A reading of 100 means that a family with median income would need to spend fully 25% of its monthly income on a mortgage to purchase the median priced existing home. A reading of 140 means that 25% of the median family income is 1.4 times the mortgage payment for the median priced existing home.

Housing Affordability Indices



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

Charts & Analysis: WillSonn



Housing Starts

Total Housing Starts registered 1.256 million units in November (SAAR), 3.9% above the 2017 pace of 1.203 million units. In November, Single Family Starts registered 824,000 units, while Multi-Family Units came in at 432,000 Units.

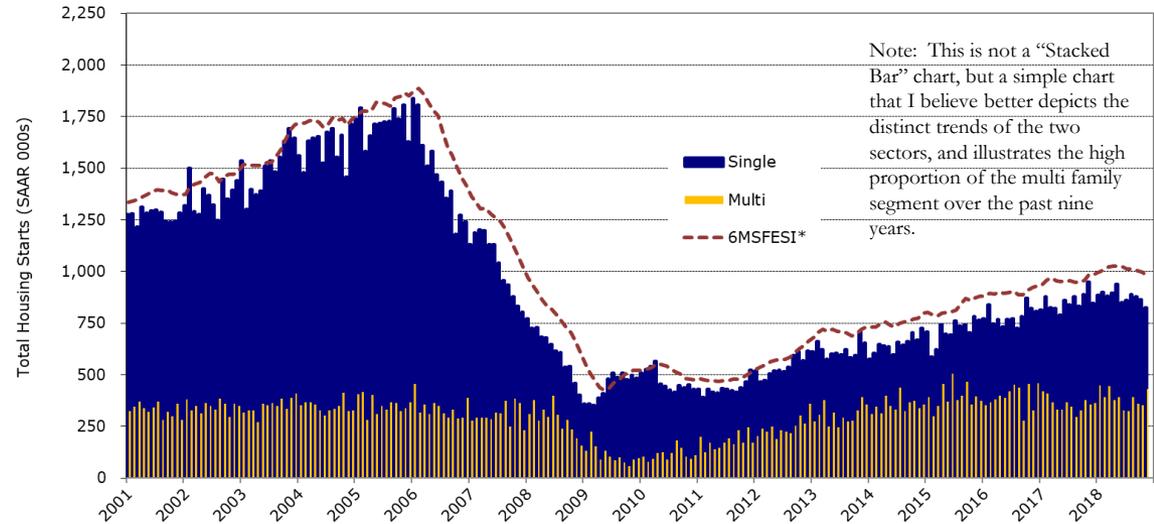
Year-to-date (SAAR), Total Housing Starts have averaged 1.264 million units, a modest increase of 4.6% over full year 2017. **Single Family Starts are up 3.2%, while Multi Family Starts are up 7.7%, compared to 2017.**

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 demand for wood. After eight months above a million, the six-month rolling average dipped to **982,000 units, representing 52% of the 2006 peak of 1.9 million SFES’s.**

Multi-family units use approximately 2/3 as much wood per square foot 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.

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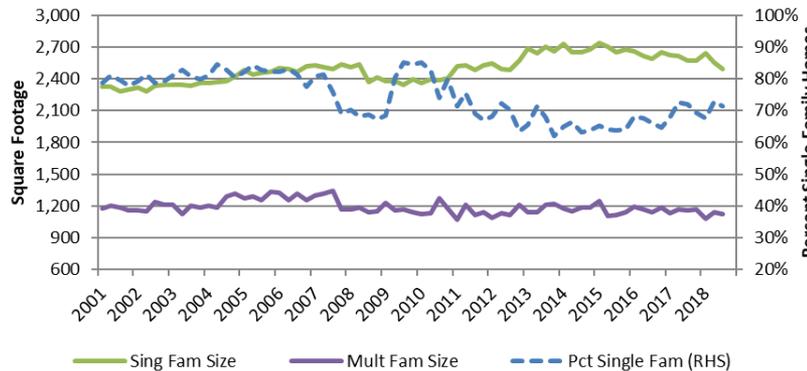
Single and Multi Family Starts (SAAR)



*6MSFEST = 6 Month Single Family Equivalent Start Index
Data Source: U.S. Census Bureau

Charts & Analysis: WillSonn Advisory

Average Home Size and Mix (Starts)



The size of the Single Family Home Starts in Q3 averaged 2,495 sq. ft., down 4.0% from 2017’s average of 2,599 sq. ft., the smallest since 2012. The size of Multi-Family Units started in Q3 averaged 1,125 sq. ft., down 2.4% from 2017 average of 1,153. **Single Family units made up 71% of Total Starts in Q3, after averaging 70% in 2017.**

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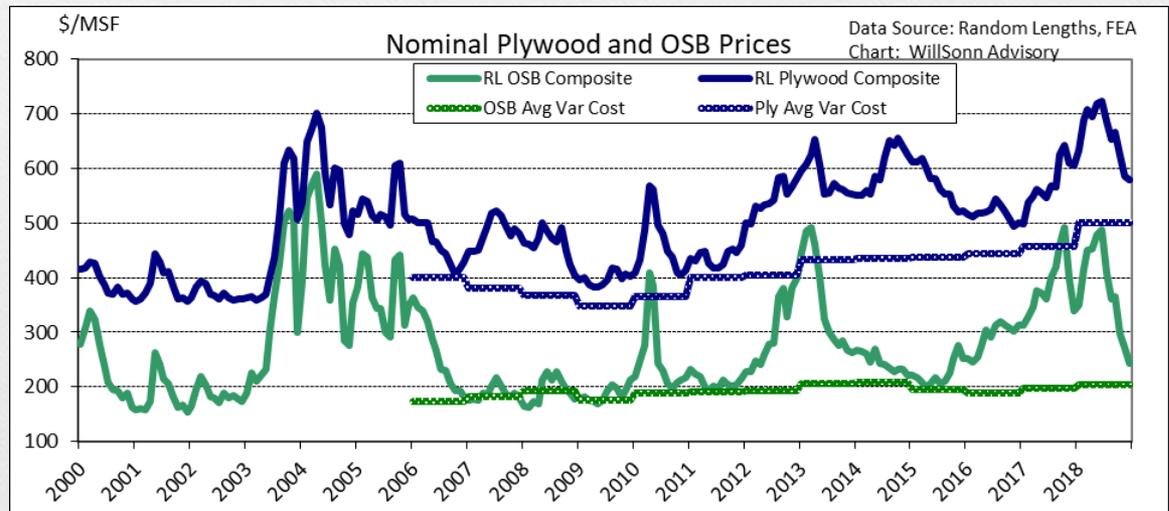
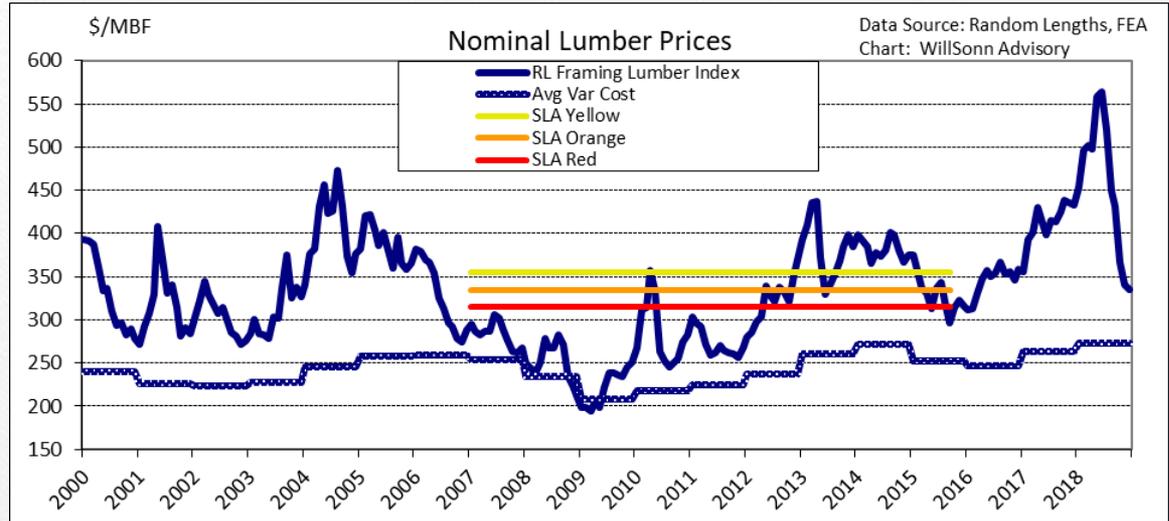
Wood Product Prices

In 2017, while Single Family Housing Starts were up 8.6% and Residential Improvement Spending was up 18%, North American lumber production was up only 2.2%. Through October of 2018, North American lumber production was up just 1.6%, while US Housing Starts were up 5.4%. This 21 month production lag largely caused the run up in lumber prices through June, which in turn put downward pressure on housing starts which peaked in May 2018. Builders had had enough.

Lumber prices in Q4 pulled back another 26% from Q3 prices, 14% below full year 2017 prices. Despite the weak H2, full year Lumber prices averaged 11% above 2017. Regionally in the fourth quarter relative to the previous quarter, West Coast lumber mills saw an 28% decline for Dry Dimension and 26% lower prices for Green DF, Inland mills saw prices move down 18%, while Southern sawmills saw prices contract 17%. Canadian components of the Random Lengths Framing Composite Index saw declines of 26% and 20% in the West and the East, respectively.

Plywood pricing also retreated during the quarter, sliding 11% from Q3, but still up 16% from FY 2017 levels. Fourth quarter movements were even in the South and West, down 11% for the quarter.

OSB prices in Q4 were 28% below Q3 prices, and 19% below FY 2017 prices. For the year, OSB was flat with 2017 prices (which were 32% above FY 2016).



The sharp 28% decline in western lumber prices in the fourth quarter of 2018 pushed coastal log prices dramatically lower.

In the fourth quarter of 2018, delivered prices for **Douglas-fir 2saw** and **Western hemlock 3saw** continued their declines, diving **16%-17% lower in the quarter.**

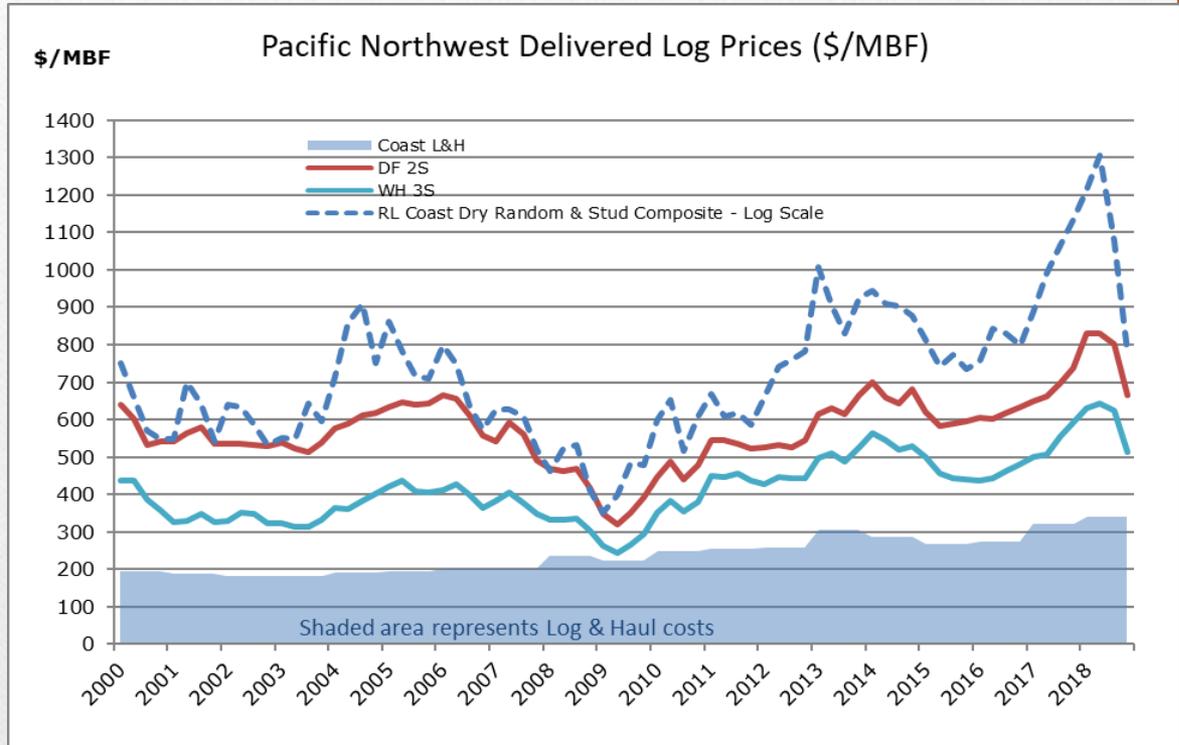
However, with record prices in the first three quarters, full year 2018 DF 2saw prices were 14% above 2017 prices and WH 3saw was 12% above 2017. This comes off of full year 2017 delivered log price increases of 12% for DF 2saw and 22% for WH 3saw.

After adjustments for lumber recovery, the Random Lengths Coast Dry Random & Stud Composite price (on a log scale) retreated another \$299/MBF in Q4, following a retreat of \$229/MBF in the second quarter. The fourth quarter dive drove full year prices gains to just 7% above 2017, and mill gross margins to their lowest levels since 2011.

Log & Haul costs increased less dramatically, resulting in net stumpage values increasing 21% in 2018 over 2017 for both species.

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PNW Log Prices



Data Source: Oregon DOF, WA DNR, Random Lengths, FEA
Charts & Analysis: WillSonn Advisory

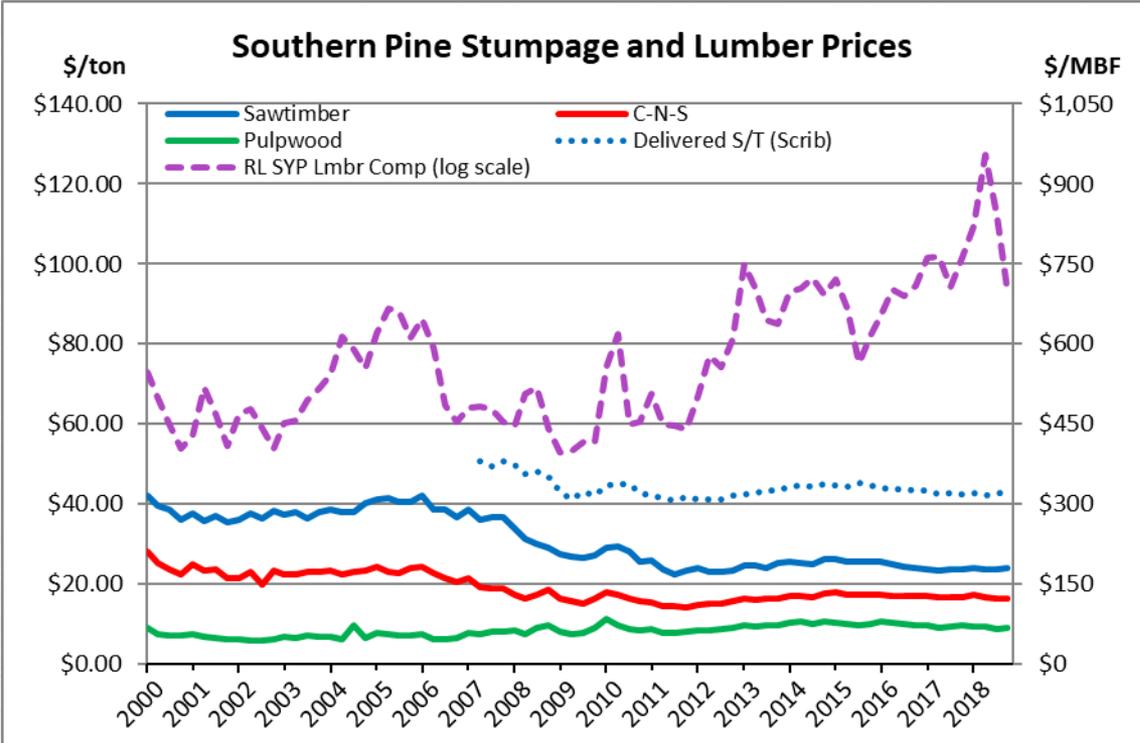
Southern Pine Log Prices

Fourth Quarter Southern Yellow Pine stumpage markets were mixed, with sawtimber and pulpwood ticking up, but Chip-n-Saw slipping. SYP Sawtimber prices gained a paltry \$0.15/ton in the fourth quarter, putting full year 2018 prices up 1% compared to FY 2017 average prices. Chip-n-saw stumpage prices were off another 1% quarter over quarter and ended the full year dead flat with FY 2017.

The modest movements in Q4 again defied movement in the Random Lengths SYP Lumber Composite, adjusted for lumber recovery, which was down 17% in Q4 compared to Q3 prices, trimming YOY gains to 11% above FY 2017.

Pine Pulpwood prices recovered 3% in Q4, but stayed below \$10/ton for the ninth quarter in a row. YOY, pulpwood prices declined 3%. As lumber production continues to expand in the South over the next few years, mill residual chip supplies will increase. Downward pressure on roundwood pulpwood prices will likely persist.

Sawtimber to Pulpwood price ratios remain tight, at a very meager 2.5:1 in the 2012-18 period, well below the bellwether ratio of 4:1, a level not seen since mid-2008!



Data Source: Timber Mart South, Random Lengths, FEA
 Charts & Analysis: WillSonn Advisory

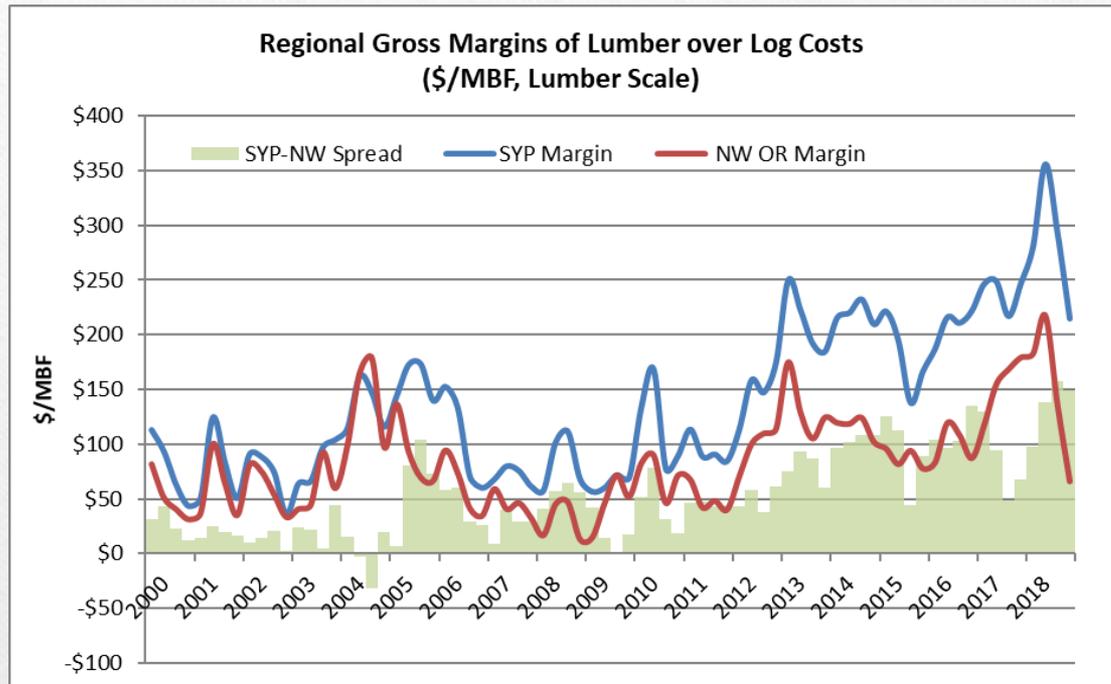
Sawmill Gross Margins (lumber price minus delivered raw material costs) in the Northwest and South were derived from the figures on the previous two pages. The difference between the two regions is the “spread.”

The spread between Southern and PNW sawmills remained elevated in Q4 at \$149/MBF, up from an average spread in 2017 of \$85/MBF. Gross margins narrowed in both regions, from \$135/MBF to \$66/MBF in the PNW, and from \$292/MBF to \$215/MBF in the South. Southern sawmills have enjoyed gross margins over \$200/MBF in 18 quarters since 2012, while PNW mill gross margins hit that mark once

Since the beginning of 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 have improved. The net result has been that the gap between the PNW’s and South’s gross margin has swelled to an average of \$110/MBF over the last eight quarters, more than 3x the 2000-2013 average of \$33/MBF.

Lumber producers will continue to focus capital investments in the US South to capture outsized margins. Absent some catastrophic event, it will likely be years before Southern mills work off excess standing sawtimber inventories.

Regional Gross Margins



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.

Data Sources: Timber-Mart South, Random Lengths, FEA, Oregon DOF, WA DNR
Chart & Analysis: WillSonn Advisory

Closings in 2018 totaled 2.0 million acres for \$3.13 billion, a 57% increase in acres and 67% increase in proceeds.

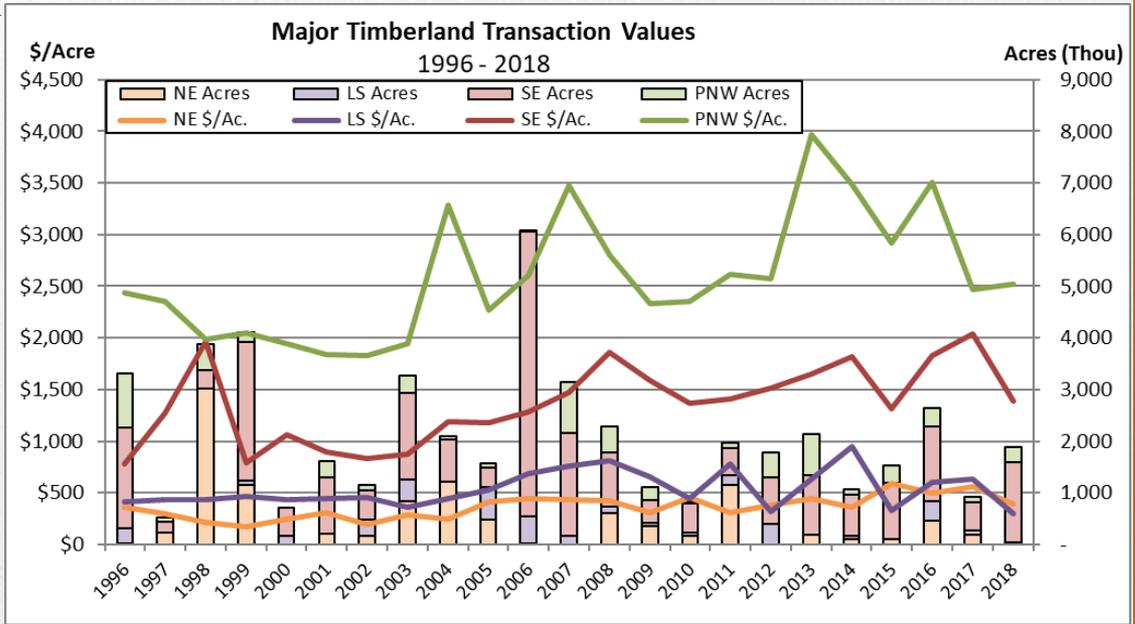
A single transaction, CalPERS/Campbell's sale of 1.1 million acres in Texas to CatchMark and its co-investors for \$1.39 billion, made up 54% of the acres sold, and 44% of the proceeds across all regions. Absent this sale, YTD totals were more modest at 925,000 acres, \$1.74 billion in proceeds.

By investment sector, Timberland Investment Management Organizations ("TIMOs") have funded 83% of the acquisitions in 2018, well above the 41% captured over the last five years (2013-17). By comparison, TIMO buyers acquired 78% of US timberlands sold (by dollar) in the previous 13 years (2000-2012).

Regional timberland prices are all down so far this year, largely due to larger, lower quality properties ("B&C" properties, as some call them). PNW timberlands sold for as much as \$8,100/acre, but Roseburg's \$1,440/acre sale in northern California (61% of the region's acres) weighed down the Left Coast average. Likewise, in the South, property values reached into the \$3,100 per acre range, but the \$1,265 paid for the beleaguered CalPERS/Campbell properties in Texas (79% of the region's acres), was a Titanic drag on the region's average.

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Regional Transaction Values



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

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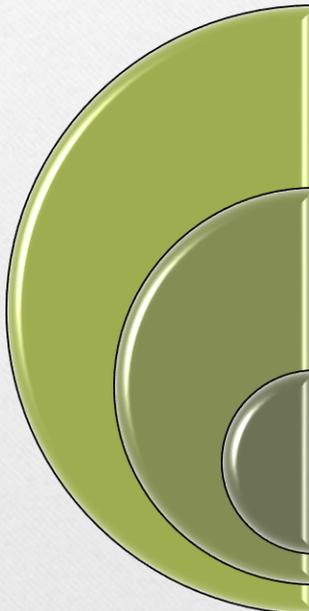
Section 2:
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WillSonn Advisory

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



<h3>Sectors</h3>	<ul style="list-style-type: none">• Timber, Manufacturing, Bioenergy• Private Industry & Institutional Investment• Corporate Lending• Consulting• Domestic and International
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- Acquisition “Post Mortem” Audits
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Business Assessments & Due Diligence Services



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- Contingency Plan Development and Monitoring
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- Work-out Strategy Development
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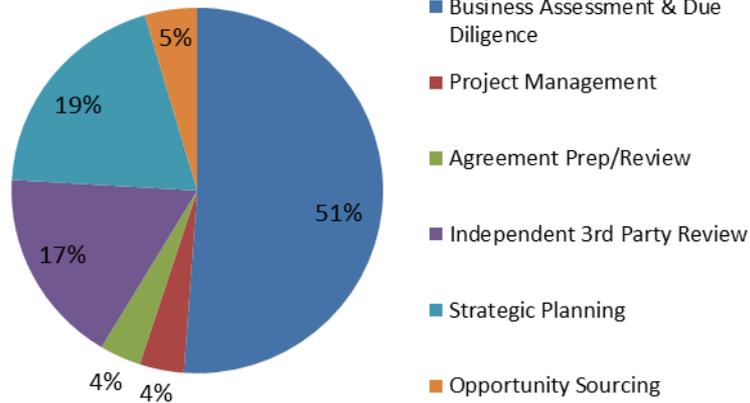
- Validate Acquisition Valuations & Due Diligence Procedures
- Evaluate Existing or Proposed Agreements or Easements
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- Examine Proposed Transfers of Ownership
- Review Divestiture Timing & Strategies
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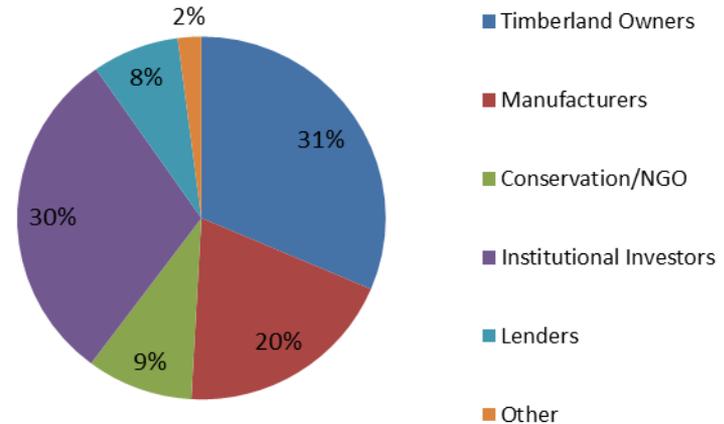


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Since early 2009, Will Sonnenfeld has been pleased to provide a broad range of consulting services to dozens of clients across the full spectrum of industry sectors.

I look forward to your comments and questions, and welcome the opportunity to serve your consulting needs.

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