



17 July 2017



**SENT TO LSU AGCENTER/LOUISIANA FOREST PRODUCTS DEVELOPMENT CENTER - FOREST SECTOR / FORESTY PRODUCTS INTEREST GROUP**

- Homebuilder sentiment retreats from 12-year high (page 4)
- Affordability drifts lower, but remains favorable (page 5)
- Inventories of Homes for Sale continue to trend downward (page 6)
- Housing starts retreat in May, stifle YTD gains to just +1% over 2016 (page 7)
- Wood Product prices gain in Q2, but trending lower (page 8)
- Wood Products production moves upward in early 2017 (page 9)
- PNW Log Prices move up, Southern log prices drift lower (page 10-11)
- Southern sawmills margins best PNW mills by \$107/MBF in Q1 (page 12)
- Timberland sales very quiet through H1 2017 (page 13)
- Correlations Between Housing Affordability and Housing Starts (page 15)
- Long-term Strategies to Mitigate Overestimating Future Harvest Flows (page 16)

Please let me know if you have any questions or observations – I always enjoy the feedback. Best of luck for the second half of the year.

Best Regards,

Will

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*Please support our timber industry, reduce your carbon footprint, and conserve the earth's natural resources by purchasing products made from wood: America's great renewable, recyclable and sustainable resource.*

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Web Site: [www.LFPDC.lsu.edu](http://www.LFPDC.lsu.edu)



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



# Market Trends

2nd Quarter, 2017

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



# Q2 2017 Highlights

## Market Trends

- Homebuilder sentiment retreats from 12-year high (page 4)
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## In Depth Coverage

- Correlations Between Housing Affordability and Housing Starts (page 15)
- Long-term Strategies to Mitigate Overestimating Future Harvest Flows (page 16)



# Section 1: Current Trends



# Builder Sentiment

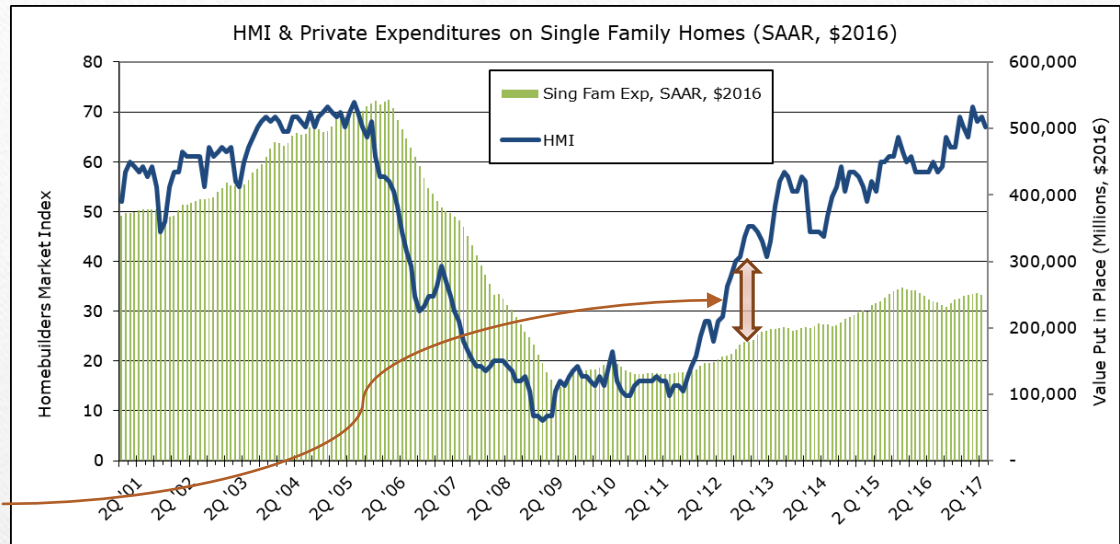
NAHB's **Homebuilder Market Index (HMI)** and **Remodeling Market Index (RMI)** are measures of home builder and remodeling contractor sentiment.

**The HMI continued its slide, registering 67 in June**, after peaking at 71 in March, equal to its all time high achieved in December of 2004. Historically, the HMI appeared to be a good leading indicator of Private Expenditures on Single Family Housing, but the correlation paused during the 2011-12 period, when homebuilders' perception far outpaced reality. Notice the gap on the top chart. The two time series appear to be moving more in step since 2013; however, the gap persists.

**The RMI rose 5 points in the first quarter**, registering a reading of 58. This was a nice rebound from the 4<sup>th</sup> and 2<sup>nd</sup> quarter readings of 53, the lowest levels of the past three years. In addition, constant dollar **SAAR Improvement Expenditures jumped 20% in Feb-Apr** compared to the same three months in 2016. While improvement expenditures show more volatility over the course of the year, they've proven to be steadier over the long-term, versus new home construction expenditures.

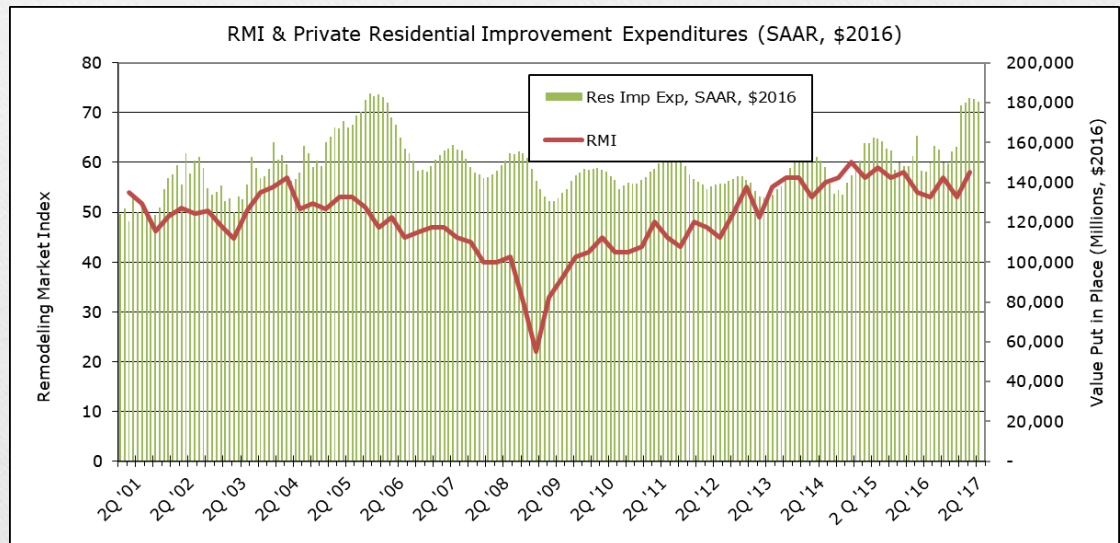
*The monthly HMI and quarterly RMI are dispersion indices, measuring the proportion of respondents who have a positive versus negative view (neutral responses are ignored in the calculation). While a reading over 50 indicates a prevailing positive view of current and future conditions, it says nothing about the proportion in the neutral camp.*

*The expenditure figures in both charts represent Seasonally Adjusted Annual Rates, and were deflated using the US Census Bureau's Construction Price Index.*  
WillSonn Advisory, LLC



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

Charts & Analysis: WillSonn Advisory



# Affordability

With a reading of **156 in April**, the monthly **NAR Affordability Index (top right)** remains **encouraging**, as it continues to hover in the 150-180 range (before the GFC, cyclical peaks were ~140). 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.

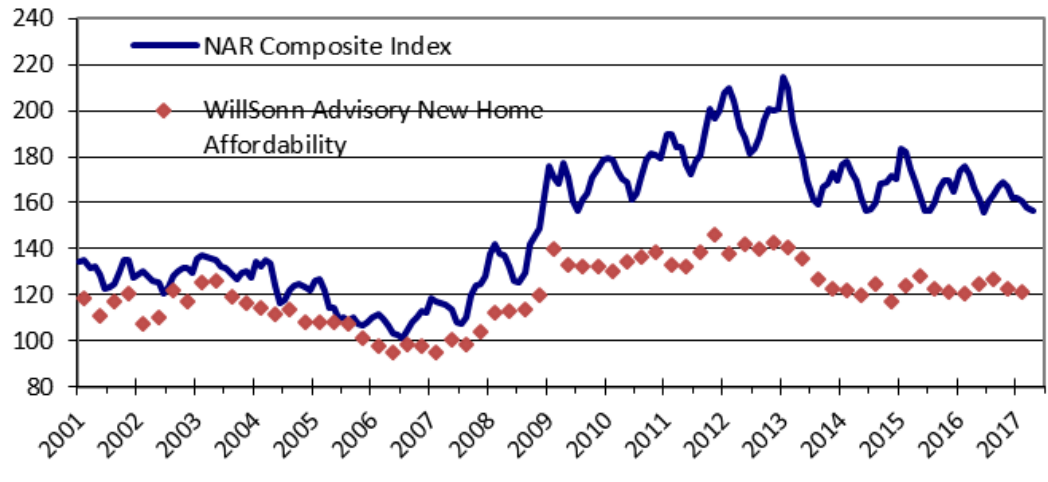
Also depicted is a complimentary measure of affordability, one that incorporates the transaction price of new homes (rather than the listing price of existing homes, as used by NAR). Using NAR's household income and interest rates and Census Bureau median new home sale prices, I calculate a more modest **New Home Affordability Index of 121 in Q1 2017**.

The gap between new and existing home affordability is due to new home premiums growing from ~10% prior to the housing bust, to over 30% the past six years. As a result, new homes are a much longer reach for first-time home buyers, a contributor to weak single family housing start figures.

Examining the three components of the NAR Affordability Index, (bottom chart) you can see that low interest rates have been key to current high affordability readings. Also note that today's existing home prices exceed those of the pre-bust period.

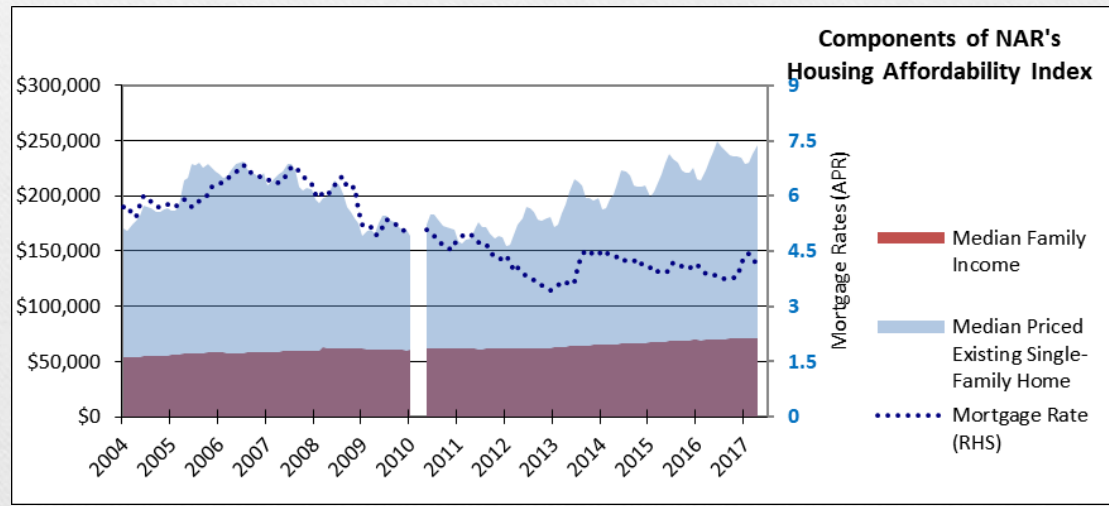
Going forward, growth in median family income appears to be gaining momentum as the US reaches full employment, but impending hikes in mortgage interest rates will tend to offset. Other headwinds affecting a household's ability to purchase a home include persistently tight lending standards, growing student debt loads born by first-time homebuyers, and the lack of a non-Agency Residential Mortgage Backed Securities market to free up lender balance sheets.

## Housing Affordability Indices



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

Charts & Analysis: WillSonn Advisory

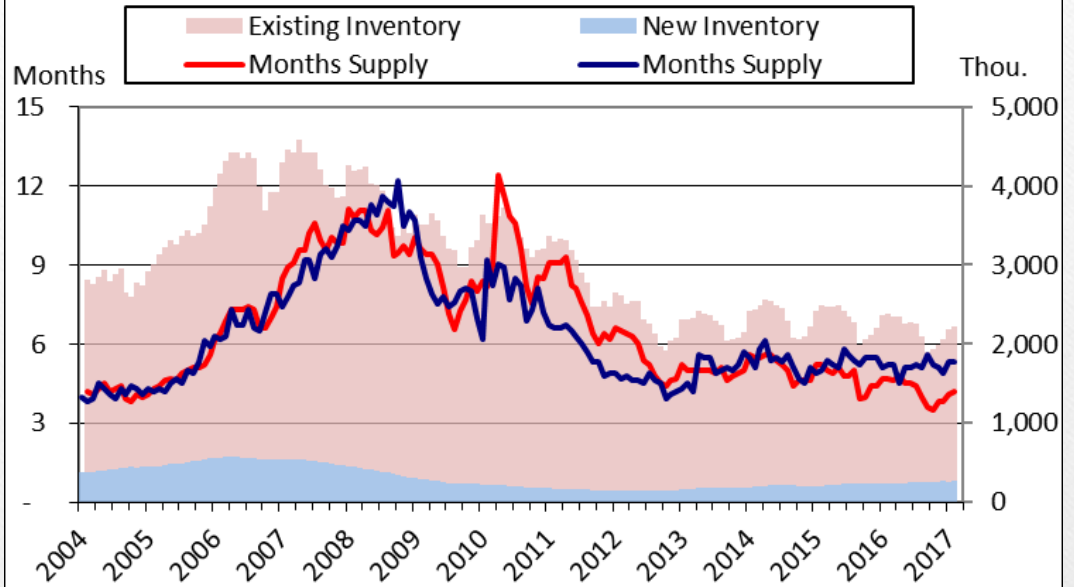


# Home Sales and Construction

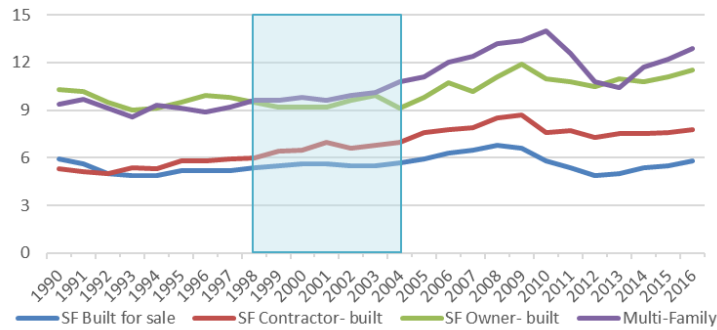
Total Single Family home inventories (New + Existing) totaled 2.225 million units in May, up 318,000 units from December '16, but down 153,000 units from May, 2016. At the current pace of sales, there are 4.2 months of sales in existing home inventories and 5.3 months of new homes in inventory, somewhat elevated from the 4-4.5 months supply prior to 2006. The low absolute level of existing homes for sale has contributed to the higher existing home prices discussed earlier. While the inventory of new homes has slowly been improving, it remains quite low in absolute terms. It should also be noted that "New Homes For Sale" includes not only completed construction, but also homes under construction and homes not yet started if listed for sale by the builder. At the end of 2016, completed homes made up just 25% of "new homes listed for sale."

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

Single Family Homes for Sale & Months Supply (SAAR)



Private Housing Starts  
Months from Start to Completion



The Pace of home Construction varies by who builds the home, but all segments saw an increase in building time in 2016. **The average time for construction of homes Built for Sale increased to 5.8 months in 2016**, close to the 1998-2004 average of 5.5 months.

For the last 20+ years, homes built for the landowner have taken more time. Contractor Built homes (where a contractor was hired as General Contractor ("GC") by the Owner) averaged 7.8 months in 2016, start to finish, 1.2 months longer than its average during the 1998-2004 period. Where the Owner acted as GC, average construction time was 11.5 months in 2016, 1.9 months longer than its average during the 1998-2004 period. **Multi Family completion time has soared to 12.9 months, 3 months longer than its average during the 1998-2004 period.**

Over the last five years, single family homes Built for Sale made up 73% of all single family homes constructed, homes built for the landowner by a Contractor made up 15%, and Owners built 7% of the homes. The remaining 5% of new single family homes were constructed as rental properties.



# Housing Starts

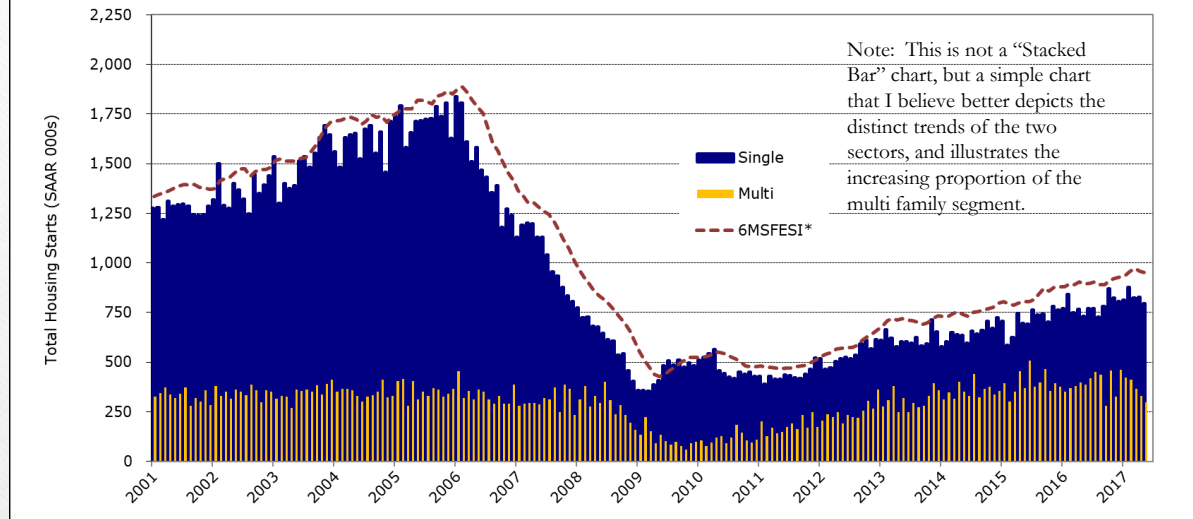
Total Housing Starts registered 1.092 million units in May (SAAR), 7% below the 2016 pace of 1.177 million units. In May, **Single Family Starts fell to 794,000 units in May**, the first reading below 800,000 units since last September, while Multi-Family Units came in at a tepid 298,000 Units in May. Estimates for March and April were also revised downward in the Census Bureau's latest release.

Year-To-Date, Single Family Starts are up 7% while Multi Family Starts are down 3%, compared to the first five months of 2016. Compared to the full year 2016, Single Family starts are up 5% while Multi-Family starts are down 7%.

My Single Family Equivalent Start Index, which recasts a multi family unit into a single family unit based on relative wood use, dipped to **950,000 units over the previous six months, slightly above the 50% level of the 2006 peak**. *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.*

Average Single Family Home size improved in the first quarter of 2017, averaging **2,628 sq ft**, on par with 2016 average of 2,631 sq ft and 2.3% smaller than 2015's average of 2,691 sq ft. Multi-Family Units averaged **1,148 sq ft** in the first quarter, down 2.0% from 2016 average of 1,172, and down 0.4% from 2015's average of 1,152 sq ft. Over the past four quarters, 66.5% of housing starts were Single Family Units.

### Single and Multi Family Starts (SAAR)

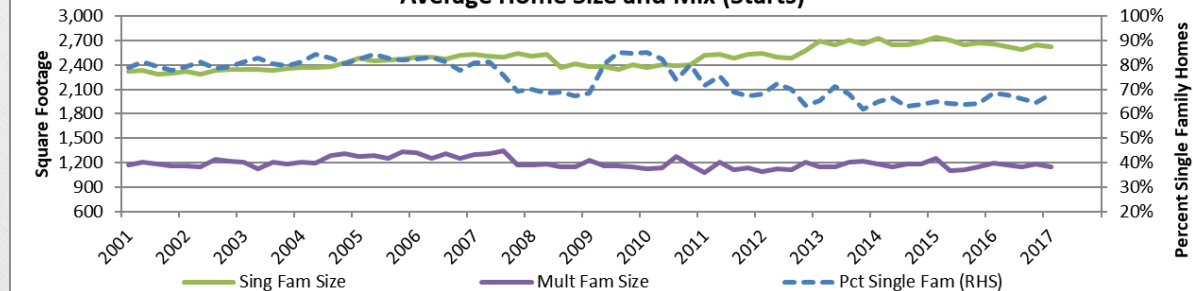


\*6MSFESI = 6 Month Single Family Equivalent Start Index

Data Source: U.S. Census Bureau

Charts & Analysis: WillSonn Advisory

### Average Home Size and Mix (Starts)



# Wood Product Prices

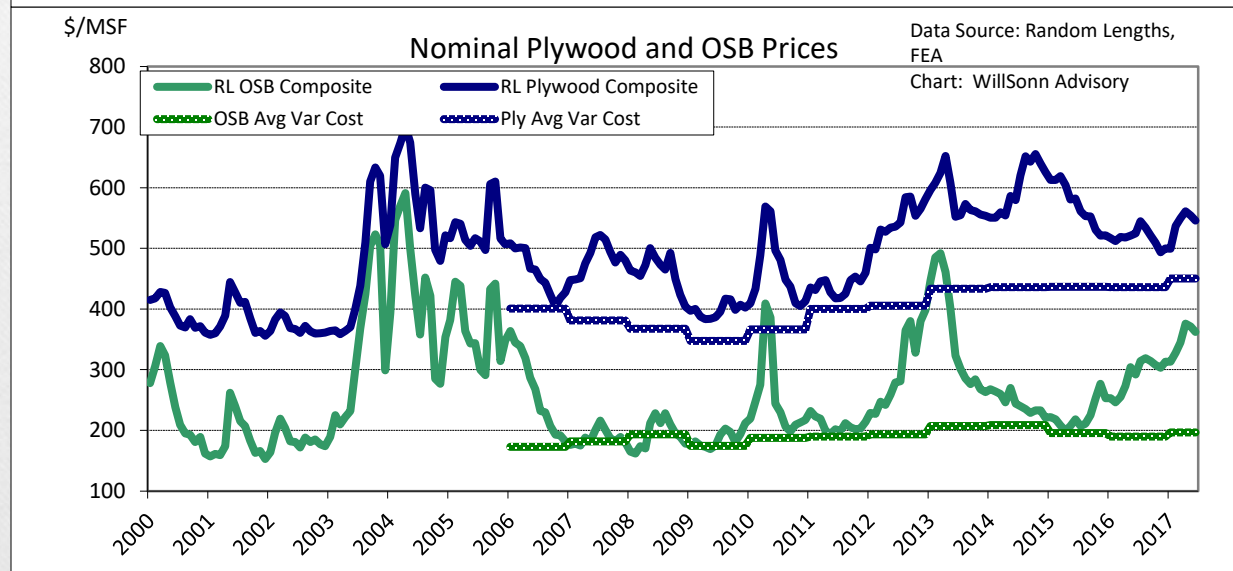
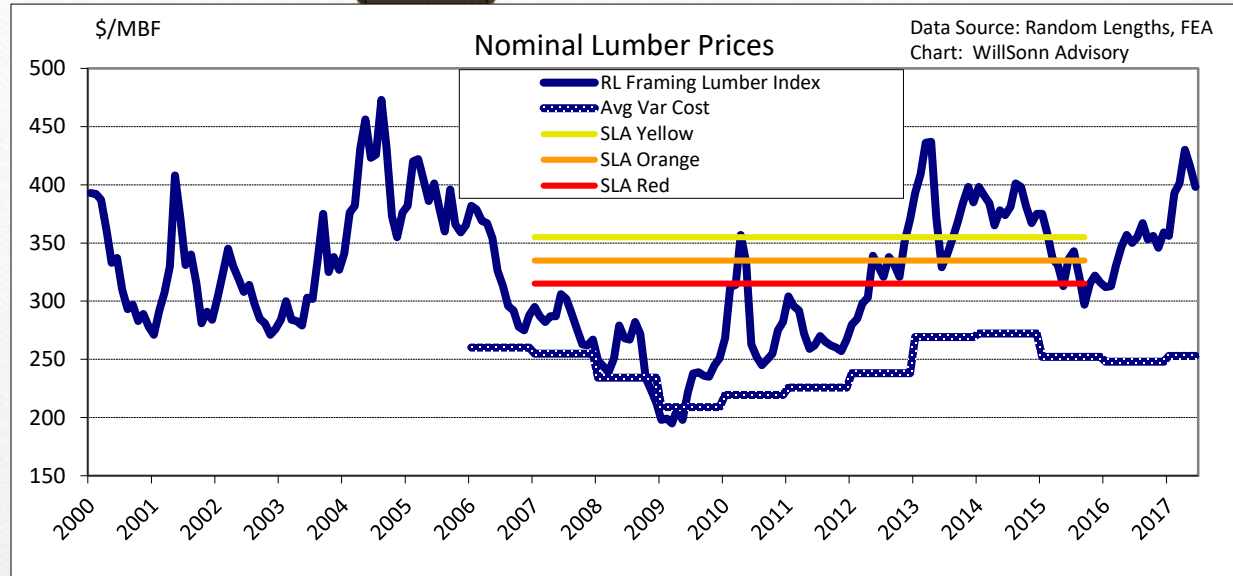
All products peaked in April, followed by measured retreats in May and June. Much of the run-up was tied to the Lumber Trade dispute, with tepid housing start figures dampening prices for all products

**Lumber prices in Q2 were up another 8% from the first quarter, and 20% above full year 2016 prices.** Variable costs are expected to edge up in 2017. Regionally for the second quarter relative to the previous quarter (Q1 2017), West Coast lumber mills saw 11% higher prices and Inland mills saw prices up 13%, while Southern mills saw no increase in lumber prices. In 2017, FEA is expecting prices to improve in all regions of the US and Canada.

Plywood pricing also improved for the quarter, rising 5% in Q2 from Q1 prices, and were up 7% from FY 2016 levels. Second quarter gains over Q1 were greater in the West (6% vs 4% in the South).

OSB finished Q2 12% above Q1 prices and up 27% over FY 2016 prices.

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# Wood Products Production

Industrial Production data published by the Census Bureau indicates that Lumber production was up 6.0% in 2016, while Plywood & Veneer Production was up 1.9%. Reconstituted Wood Products, which includes OSB, Particle Board and MDF, was up 0.6%, while Pulp, Paper & Paperboard declined 2.1% in 2016. The Logging sector registered a 0.4% decline, an intuitive outcome given the mixed performance in the sectors it serves. Overall Industrial Production in the United States (shaded blue area) was down 1.2% in 2016. Housing Starts were up 5.6% (not shown)

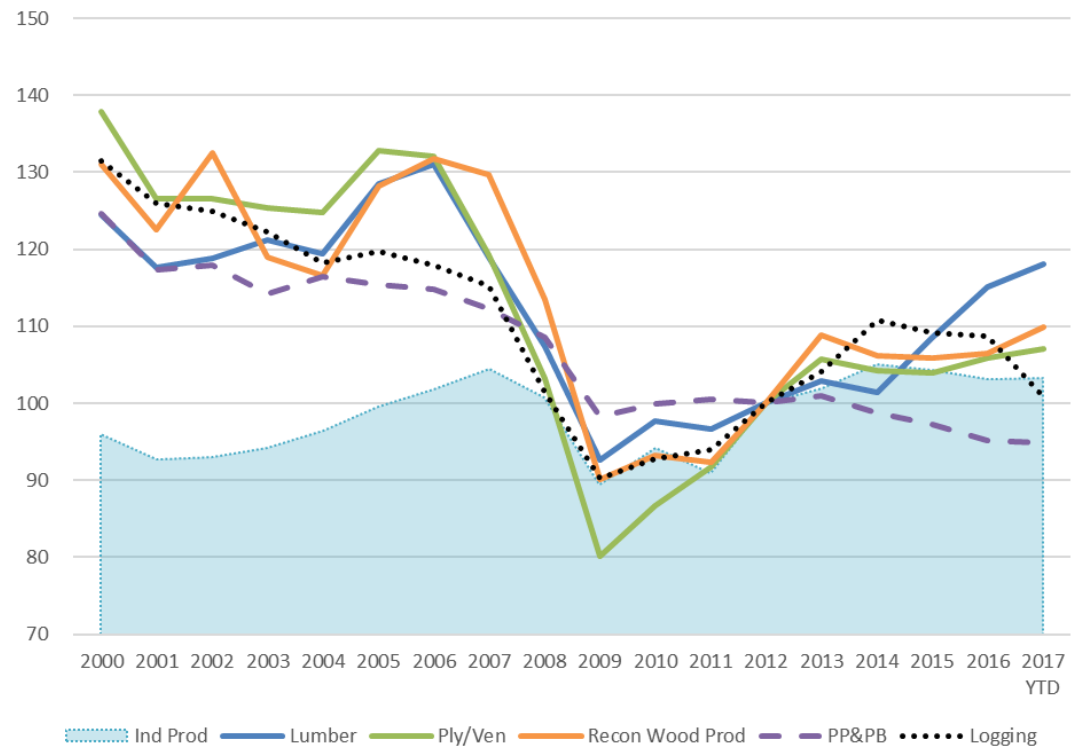
2017 data is thin (just 3-5 months), and the CB data often sees significant revisions, but early year figures (not seasonally adjusted, comparing 2017YTD:2016YTD) point towards ~3% production gains for Lumber, Plywood and RWP, flat production in PP&PB and a 1% gain in the broader Industrial Production measure. Early Logging figures point towards a 3.5% YOY decline, but this is highly suspect given the other figures.

*It should be noted that the **WWPA in December reported that US Softwood Lumber production was up 3.4% for 2016.** The Census Bureau's definition for NAICS 3211 "Sawmills & Wood Preservation" is much broader, including both softwood and hardwood sawmills, as well as wood preservation facilities.*

*Unfortunately, monthly production data is not reported at the six digit NAICS level for lumber. Likewise, the **APA – The Engineered Wood Association reported 2016 US Production increases of 0.6% for Plywood and 4.8% for OSB.***

Forest Products Sector Production Indices (2012=100)

Source: UC Census Bureau Analysis: WillSonn Advisory



Data Source: US Census Bureau, Federal Reserve Board of Governors

Lumber: NAICS 3211 (Sawmills & Wood Preservation)

Plywood: NAICS 321211&12 (Veneer & Plywood)

Reconstituted Wood Products: NAICS 321219

Pulp, Paper and Paperboard: NAICS 3221

Logging: NAICS 1133

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# PNW Log Prices

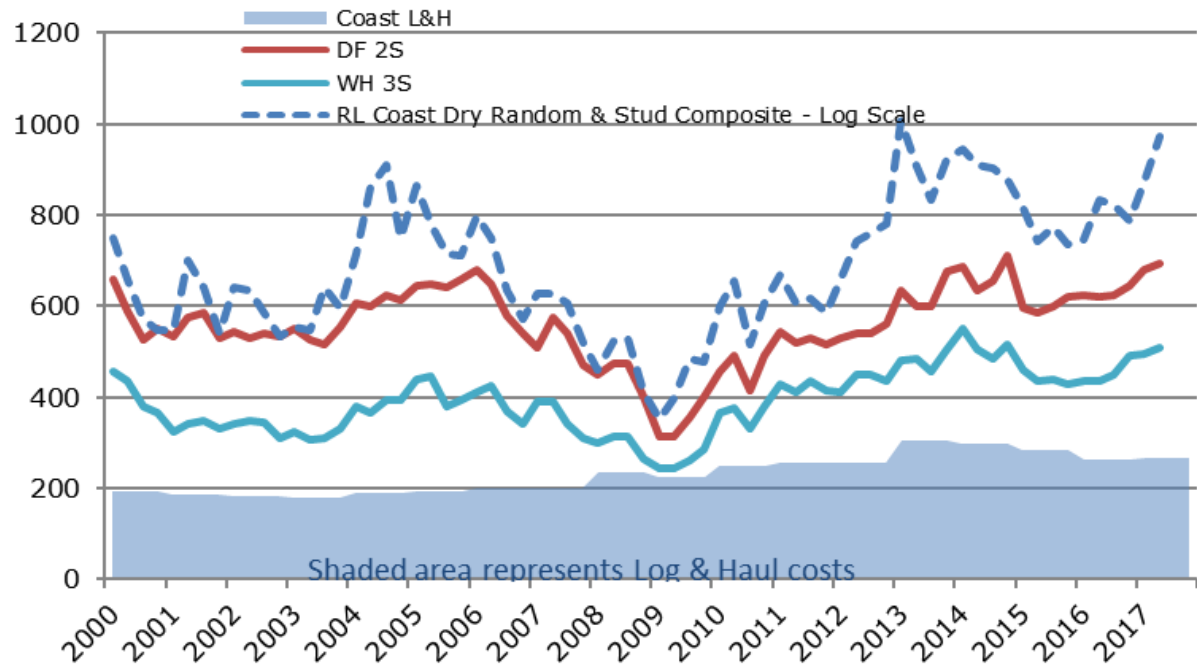
Sadly, after 40 years of reporting log prices by grade and region in Oregon, the Oregon Department of Forestry has thrown in the towel. Their data will be sorely missed. This quarter, as a stop gap measure, I used the WA DNR Q/Q change in DF and WH prices as a proxy for West coast log price changes.

In the second quarter of 2017, delivered prices for both Douglas-Fir 2saw and Western Hemlock 3saw prices gained \$15/MBF (2% and 3%, respectively). Compared to full year 2016, second quarter prices were up 11% for DF 2saw and up 13% for WH 3saw.

After adjustments for lumber recovery, the Random Lengths Coast Dry Random & Stud Composite price (on a log scale) moved up another \$100/MBF in the second quarter, an 11% gain over Q1 2017 prices, and 23% above full year 2016 prices.

Converted back to the stump, DF 2saw prices for the second quarter were 17% higher than FY 2016 prices, while WH 3saw stumpage prices were 29% higher in Q2.

**\$/MBF Northwest Oregon Delivered Log Prices (\$/MBF)**



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

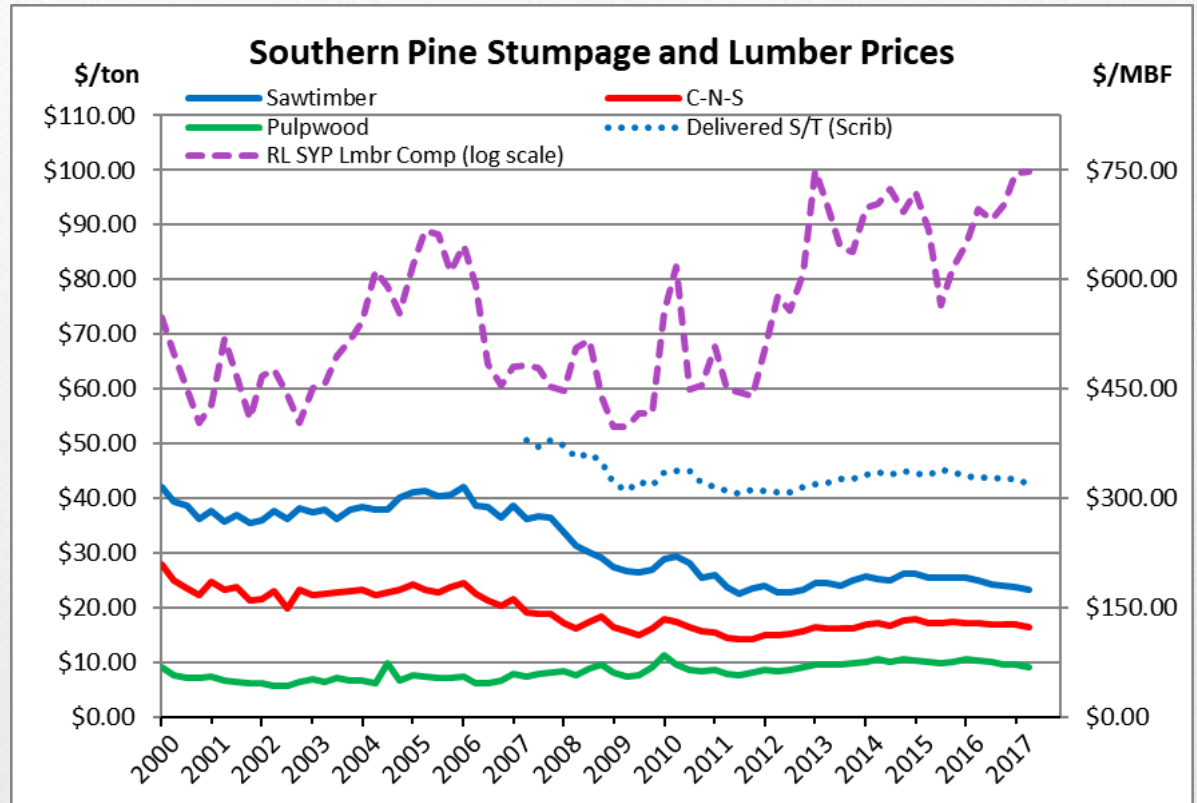
# Southern Pine Log Prices

SYP sawtimber stumpage prices drifted lower for the sixth quarter in a row, coming in 1% below Q1 '17 prices, and 5% below the dismal FY 2016 average. Chip-n-saw stumpage prices were down 2% in the quarter. Concurrently, the Random Lengths SYP Lumber Composite, adjusted for lumber recovery, was up marginally (<1%) in Q2 compared to Q1 prices, and remains 10% above average FY 2016 price.

Pine Pulpwood prices stayed below \$10/ton in the second quarter, and remains 9% below 2016 prices. This is the fifth quarter pulpwood prices have drifted lower. As lumber production expands in the South over the next few years, mill residual supplies will increase, exerting downward pressure on pulpwood prices.

*Note that in some key markets, CNS logs are selling to pulpwood buyers (and being reported as pulpwood), effectively overstating pulpwood prices. Timberland buyers beware...!*

*Another cautionary note: Sawtimber to Pulpwood price ratios have narrowed from 5.5:1 in the 2000-07 period, to a very meager 2.5:1 in the 2012-16 period. As a rule of thumb, if ratios persist below 4:1, landowners have a harder time justifying a sawtimber management regime, and bare land values (in part a function of expected future timber revenues) decline.*



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. From 2000-2011, the average spread between the regional gross margins was \$30.42/MBF. **The gap between Southern and PNW mills narrowed to \$107/MBF in the second quarter of 2017.**

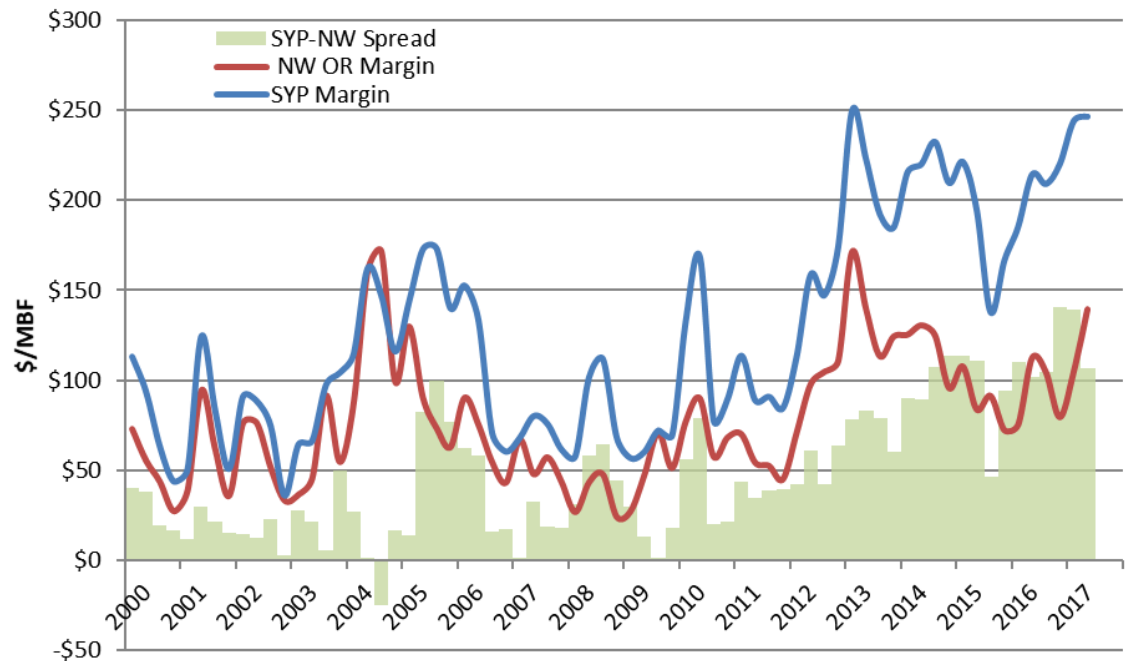
Since the beginning of 2012, we saw log export markets push PNW log prices near long-term averages, while in the South, growing inventories of mature sawtimber on the stump kept downward pressure on log prices, even as lumber prices improved. The net result was that the gap between the PNW's and South's gross margin grew to an average of \$105/MBF in the last two year time period, about 3.5x the 2000-2011 average.

Little wonder that acquisitive lumber producers, mostly Canadian, have focused their mill purchases in the South. Going forward, Lumber producers are expected to focus Capital Investments in the US South to capture outsized 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.*

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**Regional Margins of Lumber over Log Costs  
(\$/MBF, Lumber Scale)**



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

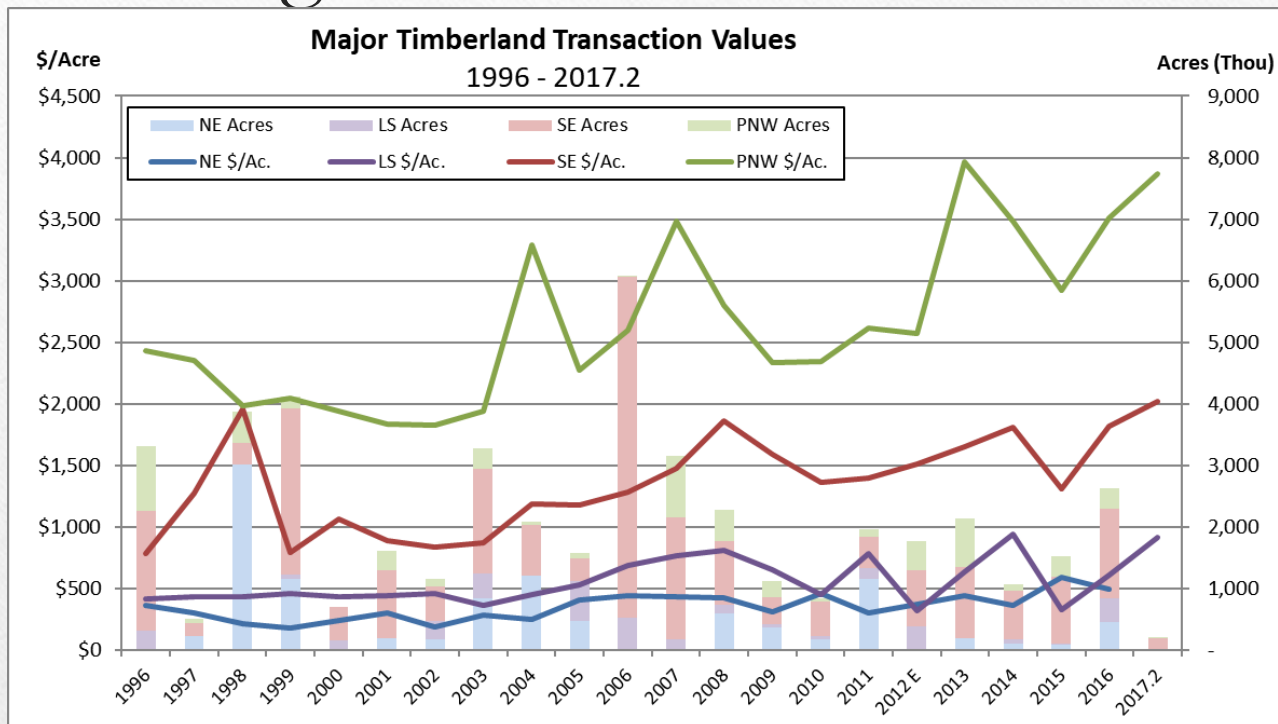
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# Regional Transaction Values

With final estimates of last year's transaction details in hand, 2016 timberland prices finished well above 2015 averages. Compiling the announced transactions as of year end, I count **2.925 million acres trading hands in 2016, for a value of \$4.59 billion**. These totals include Appalachia and Inland transactions not shown on the chart. The most notable change to Timberland markets has been the resurgence of the **TIMO buyers**, who, by my estimation, **purchased 81% (by value) of the timberlands in 2016**. This compares to 25% of purchases in the three years from 2013-2015. In the prior 13 years (2000-2012), TIMO's had acquired 78% of the timberlands sold.

**Through the end of the second quarter, few acres had changed hand** – a very small sample. More than 1.5 million acres remain in the pipeline, some of which are more challenged. If completed in 2017, I expect to see values for the year moderate in some regions, relative to 2016.



*While differences in timber quality and markets make year to year comparisons tricky, it is safe to say that during the Great Recession, timberland values softened across all regions, due primarily to higher discount rates employed by buyers, and lower near-term log prices. Furthermore, if the values bid on failed (“no-sale”) offerings (more common 2009-2014) were factored in, timberland values would have been even lower. It is also worth noting that seemingly weak 2015 timberland transaction prices were heavily influenced by “challenged” offerings (lower quality forests and/or forests in lower quality markets). A couple cases in point: in the US South, fully 65% of all timberland sold in 2015 was in Florida, at an average price of \$1,238/acre; in the PNW, 41% of the acres sold were in California, at an average value of \$1,696/acre.*

**NE:Northeast LS:Lake States**

**SE:Southeast PNW:Pacific Northwest**

Data Source: TMS, TMR, Press Releases Charts & Analysis: WillSonn Advisory



## Section 2: Deeper Dives





# Correlations Between Housing Affordability and Housing Starts

Rising or high Housing Affordability is often cited as a justification for rising Housing Starts, an intuitively satisfying supposition. Statistics suggest otherwise...

- Over the past 25 years, the two have been moving in opposite directions, i.e., they are negatively correlated (with a significant  $R^2$  of .63)

Which component of the National Association of Realtor's Housing Affordability Index ("HAI") has the greatest impact on the reading (i.e., what proportion of the variation in the HAI is explained by each of its components)?

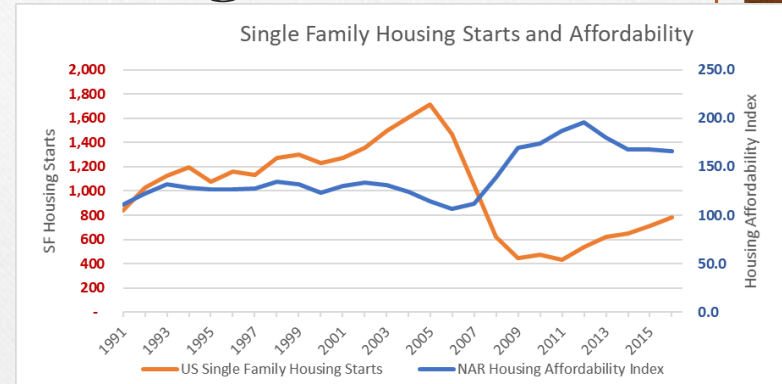
- Interest Rates had an  $R^2$  of .65 (so, 65% of the variation in the HAI is explained by the variation in interest rates)
- Median Family Income had an  $R^2$  of .39
- Median Existing Single Family Home Price had an  $R^2$  of just .09

I also looked at the relationship between SF Housing Starts and Interest Rates, and found that the correlation was quite low ( $R^2$  of .26). But if I lag Housing Starts by two years, the correlation improves to .39, still not great, but stronger than the coincident time series.

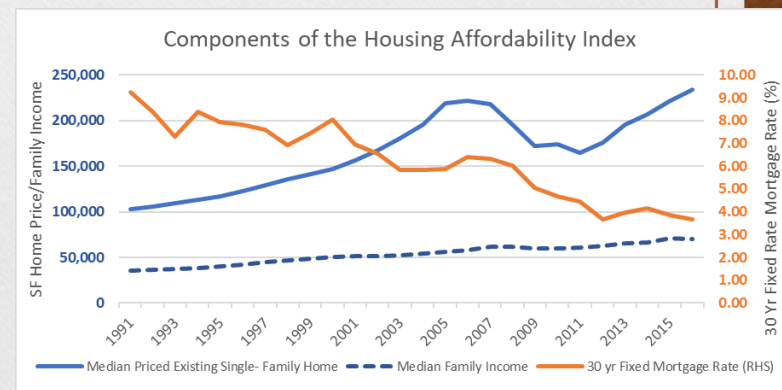
- This suggests that some buyers can take a year or two to react to changes in interest rates when deciding to buy a new home (assuming demand for new homes leads to new home construction)

Implications:

- Don't pin your hopes for the recovery in housing on high affordability readings – historically, high affordability appears to work against us.
- Worry less about home prices, primarily watch interest rates, then family income.
  - As mortgage rates rise, affordability declines, paradoxically, a good sign
- Probably a Chicken and Egg thing...
  - Mortgage rates react to changes in demand for mortgages. As demand for housing increases, mortgage rates tend to increase with it, plus, lenders may also have to lend to buyers with lower credit scores
  - Increased demand also pushes home prices higher, with a minor negative impact on affordability
  - This line of reasoning suggests that affordability is not a driver, but rather, declining affordability is a reflection of improving activity



Source: National Association of Realtors, US Bureau of the Census, Freddie Mac Charts and Analysis: WillSonn Advisory, LLC



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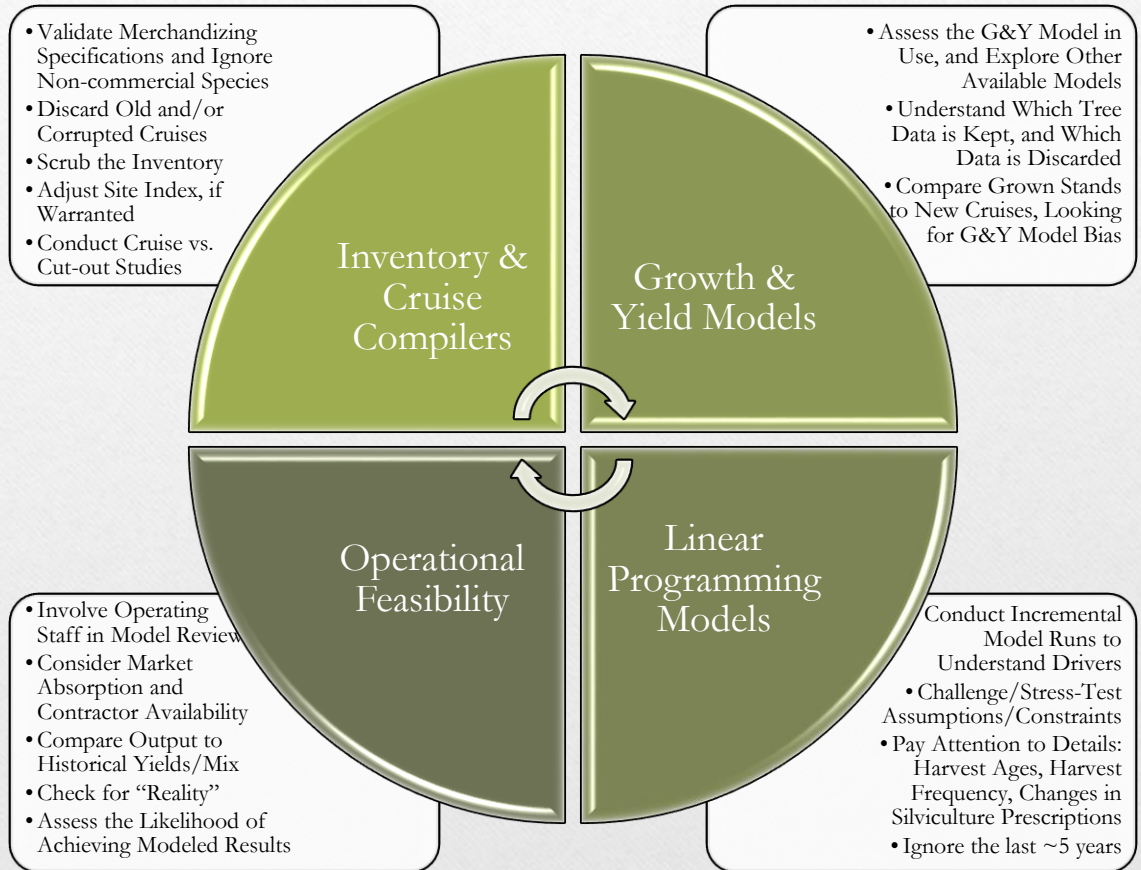
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# Mitigating Harvest Flow Model Risk

In an earlier Deep Dive, I listed common risks which are heavily biased towards overstating volumes and grade recovery in harvest schedules. The following mitigation strategies are recommended to improve reliability of each of the three harvesting schedule components: Inventories, Growth models and LP models. **Left unchecked, you risk compounding three levels of optimization – optimized harvest assuming optimized growth of optimally merchandized trees.**

Ultimately, the harvest plan must be achievable and operationally feasible in order to effectively guide the owner to realize the best economic outcome with the least amount of execution risk. **If your chance of failure is greater than your chance of success, you have an issue.**

In order to overcome institutional myopia, bring in an independent third party to review your process, validate projected harvest levels, and suggest modeling refinements.





Section 3:  
About  
WillSonn  
Advisory, LLC



# 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

## 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

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- 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



# 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"><li>• Timber, Manufacturing, Bioenergy</li><li>• Private Industry &amp; Institutional Investment</li><li>• Corporate Lending</li><li>• Consulting</li><li>• Domestic and International</li></ul>
<h3>Experience</h3>	<ul style="list-style-type: none"><li>• Mergers, Acquisitions &amp; Divestitures</li><li>• Timberland Operations</li><li>• Finance &amp; Planning, Financial Reporting</li><li>• Loan Origination &amp; Underwriting</li><li>• Operations Support</li></ul>
<h3>Expertise</h3>	<ul style="list-style-type: none"><li>• Strategic Planning</li><li>• Asset Valuations and Due Diligence</li><li>• Project Management</li><li>• Contract Negotiations</li><li>• Budgeting &amp; Forecasting</li></ul>

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

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