21 May 2017

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

I recently posted these presentations with Industry Intelligence in the past few weeks, and thought some of your contacts may have an interest.

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Revealing Trends in US Housing Occupancy

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

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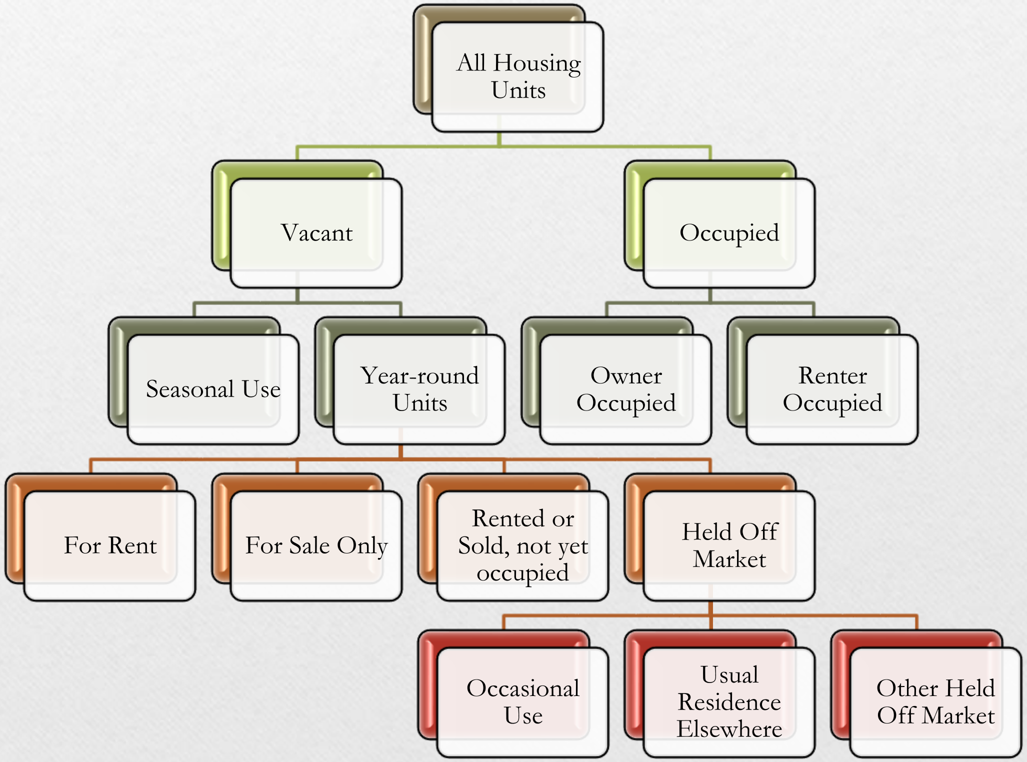
Introduction

- In an earlier study, I observed that the pace of housing starts was well below the net change in household over the past ten years. In my effort to understand how the existing inventory of homes was meeting the growing demand for housing, I looked to Census Bureau Housing Occupancy data. What I found was interesting.
- By digging into the components of how many homes in the US are occupied and vacant, and looking at all of the various subcategories within, we can gain some insights as to how changes in the ownership and occupancy of the existing home might be impacting the market and demand for new homes, and may give us clues about the future directions of the housing market.
- The data analyzed was collected by the US Bureau of the Census in the Current Population Survey/Housing Vacancy Survey, Series H-111, with data going back to 1965. The 2015 survey results are based on a sample of 82,000 housing units distributed across 900 counties located in all 50 states.
- You will undoubtedly notice the pink bars on many of the charts on the following pages. These represent housing downturns, which I assigned to periods when Total Housing Starts dropped below 1.2 million units.
- You may also notice a blip in the data around 2002. There was some sort of adjustment made in the estimate or the process that has caused a correction in the absolute number of occupied housing units reported in the CPS/HVS series – this is addressed on page 9.
- **For those who like to read the Conclusions before diving into the details, please refer to page 10**

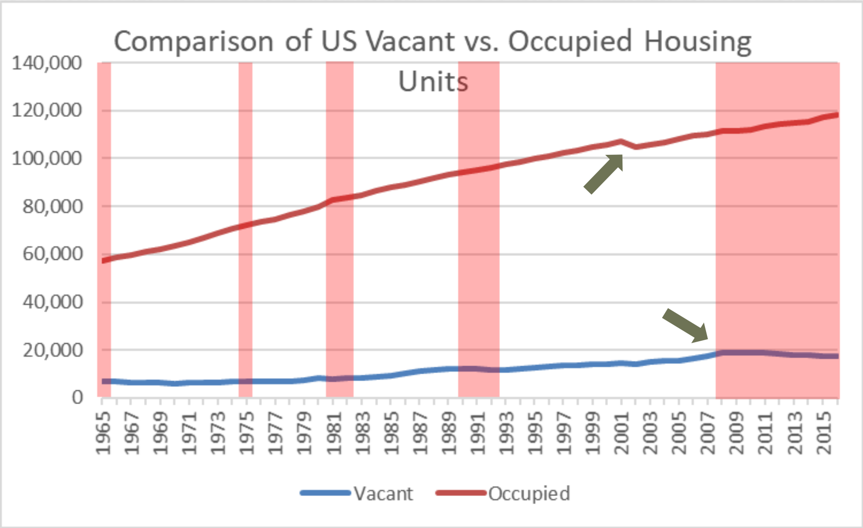
Understanding the Hierarchy and Terminology

- A "Housing Unit" is a house or apartment with its own separate living and eating area, and direct access from the outside.
- All units are either Occupied or Vacant
  - Occupied units are either Owned or Rented
  - Vacant Units are either Vacant Year-round units or Vacant Seasonal Use units (think Seasonal Resorts and Migrant Labor housing)
  - Vacant Year Round units are comprised of Homes for Rent (for rent, and for sale-or-rent), Homes for Sale Only, Homes Sold or Rented but Not Yet Occupied, and Homes Held off the Market
  - Homes Held off the Market are further broken down to homes held for Occasional Use (think Time Shares and short-term rentals), Usual Residence Elsewhere (think Second Homes), and Other Held off Market (think caretaker homes, foreclosures and homes held in unsettled estates)
- What is not a "Housing Unit?" Hotels and motels (unless someone claims one as their full time residence), dorms, prisons and barracks, quarters in institutions, hospitals and military bases.



Occupied vs Vacant Units

- In this chart, you can see that the number of Occupied homes has been climbing steadily (except for the data blip mentioned in the Introduction, and discussed on page 9), gaining 8.7 million units in the past ten years.
- In contrast, the count of Vacant Housing has been on a slow decline since the start of the current housing downturn – a modest reversal from its prior growth trend, when it peaked at 18.8 million units in 2009, drifting to 17.3 million in 2016.
- *Why it matters: As you will see on a number of the following pages, "Vacant" encompasses a very wide range of situations, and includes homes that simply are not suitable for full time residency. With that caveat, in the face of ever increasing demand for housing, it appears that previously Vacant homes have helped to fill some of the shortfall caused by the anemic housing starts figures we have seen these past nine years. As the inventory of Vacant homes gets tight, it is reasonable to expect that pressure will mount on both home prices and rents. Higher home rents and higher home prices make it harder for renters to transition to owners, as savings are depleted and affordability declines. In total, lower demand from first time homeowners (due to any number of factors), whether they buy a new or an existing home, puts a damper on new home construction, as overall demand for housing (both new and existing) benefits from higher home ownership rates.*

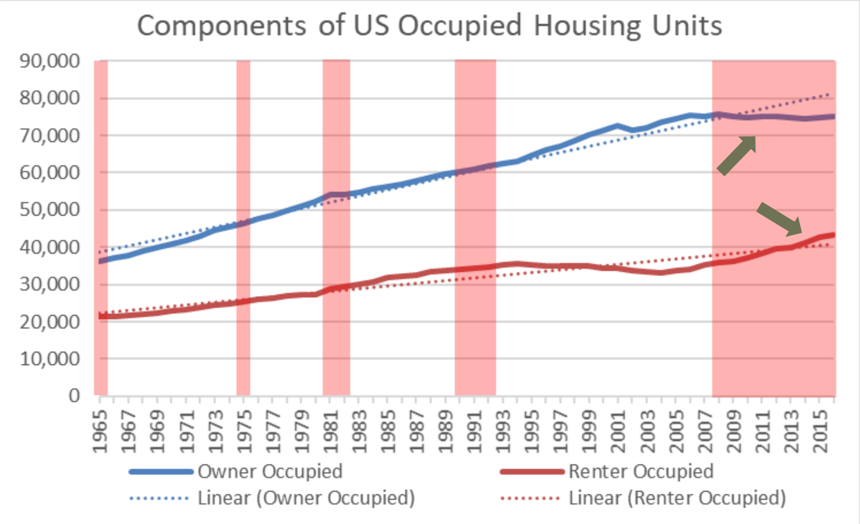


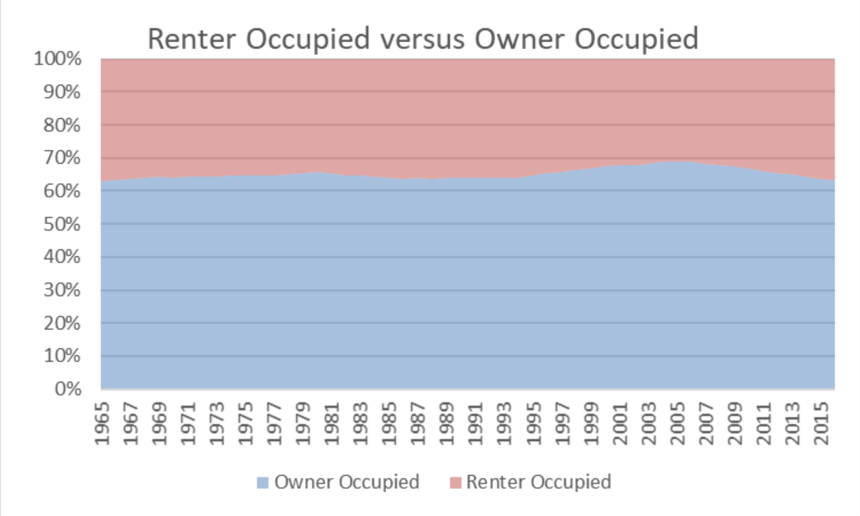
Data Source: U.S. Census Bureau

Charts & Analysis: WillSonn Advisory

Owner Occupied vs Renter Occupied Units

- Personally, I find the top chart one of the most astounding. For the last eleven years, Owner Occupied housing has been flat at ~75 million units, an event not seen in the previous 40 years. Fully 100% of the net gain in occupied housing has accrued to the Renter Occupied component, which grew from 34 million units to 43 million units.
- According to CoreLogic, 7.8 million homes were foreclosed from 2007-2016, many purchased by investors, and rented out to former home owners.
- I've added trend lines to the chart. You can see that Owner Occupied is well below trend, while Renter Occupied is only slightly above trend, similar to the 1980-2000 period.
- In the bottom chart, you can see the relative shares of Renters and Owners more clearly. The share of Owner Occupied homes in 2016 was 63.4%, comparable to 1965-1995 levels (which averaged 64.3%), but down from the peak of 69% in 2004. We <u>cannot</u> make the claim that we are in new Owner/Renter share territory, and arguably, we have simply returned to historical ownership levels.
- *Why it matters: The vast majority of new single family homes (which use more wood) are built for Owners, not Renters (just 4.9% over the last five years). And with the higher share of Multi Family units in Housing Starts, along with a number of other critical factors (rising home prices and mortgage rates, lagging median income, tight lending standards, etc.), the Renter share may remain high for some time.*





Data Source: U.S. Census Bureau

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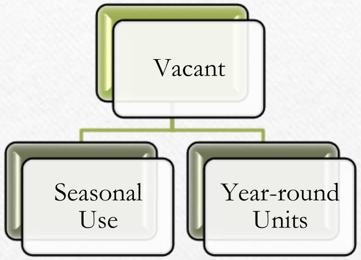
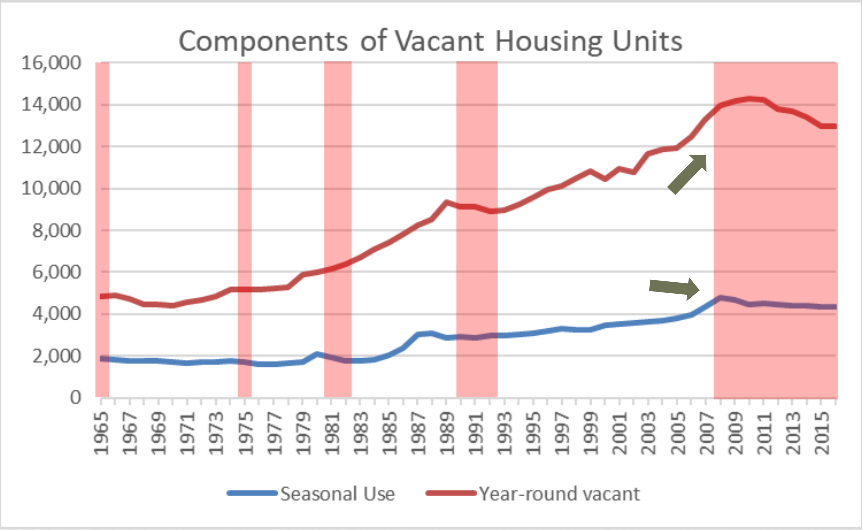
Vacant - Seasonal vs Year-Round



- As I alluded to earlier, not all homes were intended and/or suitable for year-round occupancy. In this chart, you can see that Seasonal Use Homes have trended down slightly since 2007. By definition, all Seasonal Use homes are classified as "Vacant."
- It is also interesting to see the recurring pattern of a surge in Seasonal homes just ahead of the last three housing downturns.
- From the mid 1980's to the mid 2000's, construction of Seasonal Homes added nearly 3 million homes to the housing stock, or about 120,000 homes per year.
- At the same time, we saw the number of Vacant homes suitable for Year-round occupancy accelerate ahead of, and peak a few years into, the GFC. This was followed by a period of decline. We will dig into this on the next page.
- *Why it matters: First, the virtual absence of any growth in Seasonal Use homes over the last ten years has effectively taken away 120,000 units of annual new housing starts (~10% at today's pace of total housing starts). The apparent decline may also be due to some homes being occupied on a year-round basis, thereby changing their classifications. In addition, with 12 million vacant Year-round Homes out there, if and when their owners decide to sell, it could alleviate some of the pressure on the demand for new home construction, and maybe even price. We will address this in greater detail on the following slides.*



Data Source: U.S. Census Bureau

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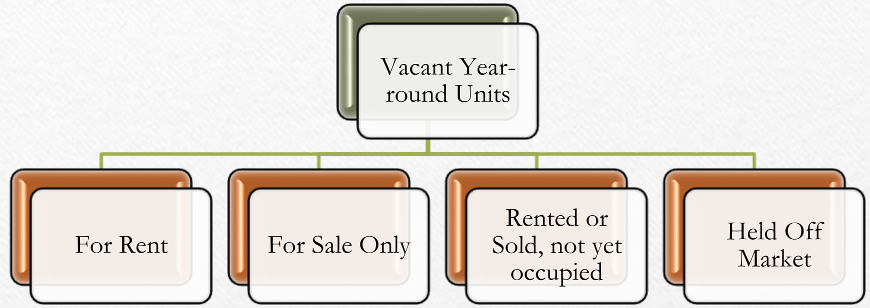
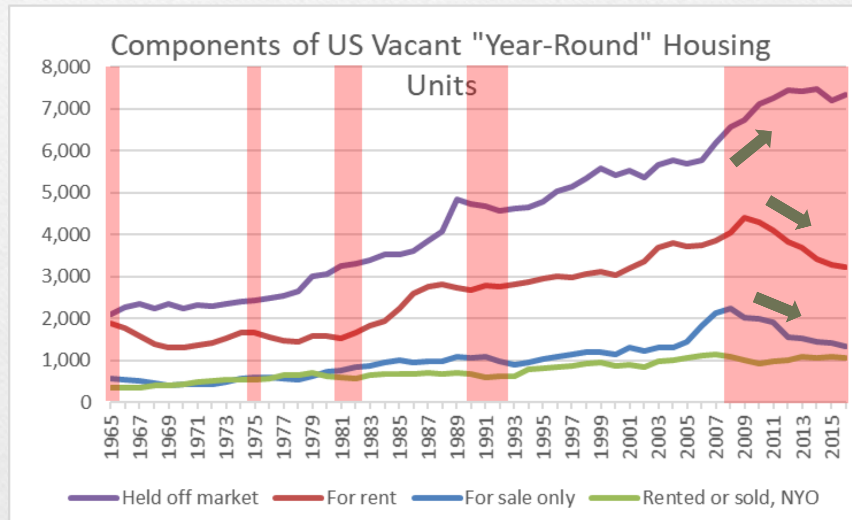
Vacant Year-Round Units



- The number of Rented or Sold, Not Yet Occupied has been relatively stable – no surprises there…
- Vacant Homes "For Sale Only" peaked early in the housing downturn, ostensibly as owners (and maybe some banks) tried to sell their homes as the housing market began to tumble.
- After an initial surge going into the depth of the GFC, the inventory of vacant Homes For Rent (which includes homes for rent or sale) began to decline, as many foreclosed homeowners transitioned into renters.
- Extended, severely weak Housing Starts have exacerbated the situation for both For Rent and For Sale, by adding too few homes to the housing stock, driving inventories down.
- The number of vacant homes Held off Market also climbed dramatically as the housing market declined, and has been holding steady at over 7 million units, or more than 5.4% of the total US housing stock, up from a historical 3-4%. We will dive into this more on the next page.
- *Why it matters: We have about the same number of vacant homes for sale and homes for rent as we did in 2002 (~4.6 million units), but we have more than 13 million additional households today. This would suggest little slack, at 3.9% of the Occupied housing stock.*

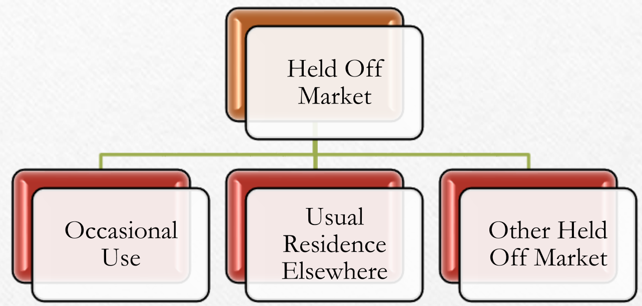


Certainly, this is lower than the 5.7% during the 2008-10 period, but comparable to 1985-2001, and higher than the average 3.0% level during the 1965-85 period. So while the pool of available vacant homes to purchase or rent is tighter than recent history, it isn't any tighter than it was for most of the last 50 years.

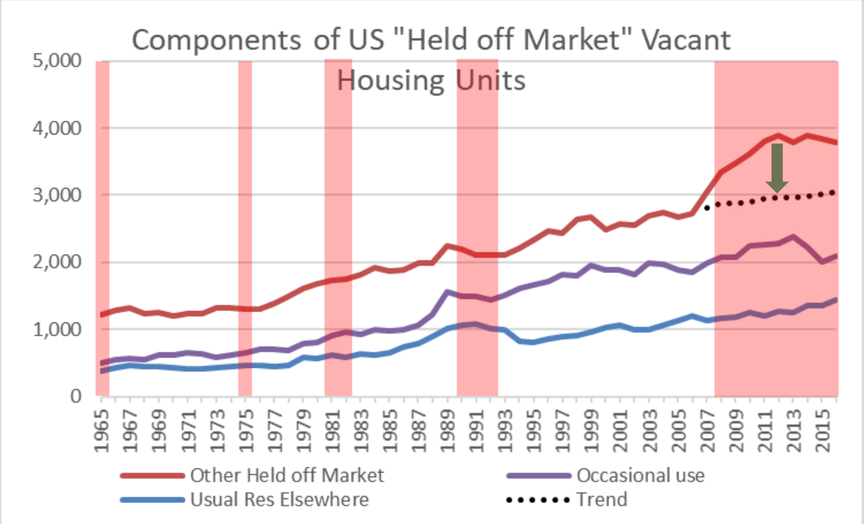
Data Source: U.S. Census Bureau

Charts & Analysis: WillSonn Advisory

Vacant Housing Units Held off Market



- While we saw on page 6 that the inventory of Seasonal Homes (e.g. seasonal resorts and housing for migrant labor) has stalled, we see here that Usual Residence Elsewhere ((“URE”) (e.g., second homes) continued to chug along. And for the most part, so did Occasional Use homes (e.g., time shares, short-term rentals), though it did show some retreat the last few years (possibly due to reclassification). Households in the top 5% were much less affected during and after the GFC, buffering the Occasional Use and URE segments.
- Clearly, it is the catch-all “Other Held Off Market” category that increased 39% in the last ten years. The full definition offered by the Census Bureau: “Included in this category are year-round units which were vacant for reasons other than [Occasional Use and Usual Residence Elsewhere]: For example, held for occupancy of a caretaker, janitor; held for settlement of an estate, or held for personal reasons of the owner.” It seems to me that foreclosed properties not listed for sale or rent would also fall into this category. Are there really 4.8 million janitors, caretakers, and homes tied up in probate?
- *Why it matters: The continued growth in second homes is different than what we hear from some of the housing experts. In addition, there appears to be an* *<u>extra</u>* *750,000 “Other” homes that are being held off the market for some reason or another, which would go a long way towards bolstering the Inventory of Existing Homes for sale (adding .75 million to the 1.3 million “homes for sale” in this survey). Low inventories of existing homes for sale is often cited as a contributor to the growth in home prices.*

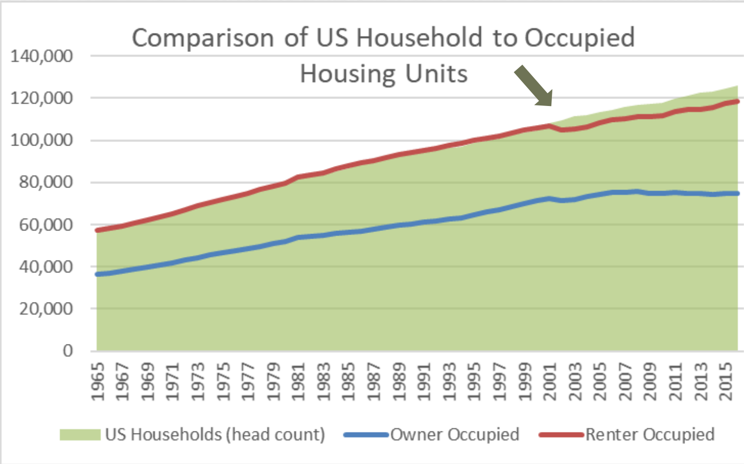


Data Source: U.S. Census Bureau

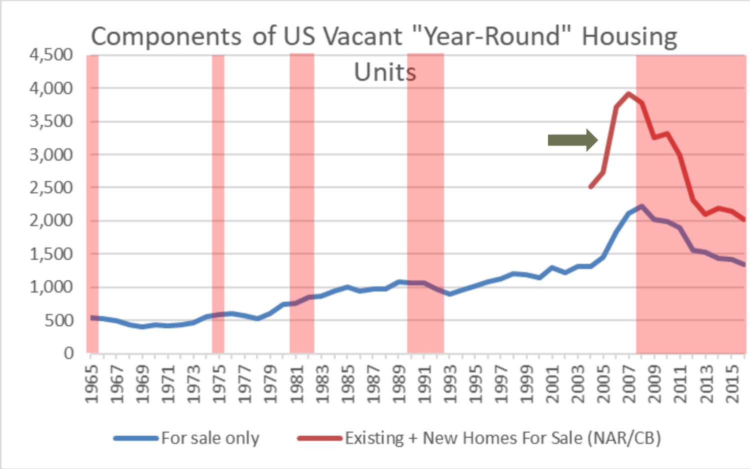
Charts & Analysis: WillSonn Advisory

Some Data Cross Checking…

- I compared CPS/HVS data to the Federal Reserve data on Total US Households (series TTLHH) which cites the Census Bureau as its source. The Census Bureau unequivocally states in its survey definitions that "The count of occupied housing units is the same as the count of households."
- Unfortunately, as you can see in the top chart (Owner and Renter lines are stacked), this has not been the case since 2002, so I have assumed that the CPS/HVS shares are correct, even if the absolute numbers may not be. Without knowing which figures are actually correct, if I had to guess, it would be the US Households – the green area.
- *Why it matters: Prior to 2002, the variance was rarely more than 1 million households. Since then, the discrepancy has grown from 4.3 million households in 2002 to 7.5 million households in 2016, or about 6% unaccounted for. Those are a lot of missing homes! At some point, the CPS/HVS data becomes suspect.*



- In the bottom chart, I compare Vacant "Year-Round" Housing For Sale number from the CPS/HVS survey against published data for Existing Homes Sales from the National Association of Realtors (NAR) and New Home Sales from the Census Bureau (CB) (combined).
- As you can see, the two data sources track against one another, but the CPS/HVS data suggests an 18% decline in inventory, compared to a 45% decline suggested by the NAR/CB data. Key differences include:
  - CPS/HVS is <u>Vacant Year-Round</u> housing units, so it would not include homes for sale that are occupied, homes "for sale or rent" which are included in their "For Rent" figures, nor would it include Seasonal Housing Units, Occasional Use or URE's for sale.
  - The CB data covers Single Family Homes only, so this time series is somewhat understated. Note: Only a fraction of New Homes For Sale are <u>Completed</u> homes (it ranged from 22% to 49% over the time period displayed), so I excluded the New Homes <u>Under Construction</u> and <u>Not Started</u> from the time series – not counted in the CPS/HVS.
- *Why it Matters: the CPS/HVS data clearly and materially understates the decline in "For Sale" inventory. But it isn't wrong, it's just different.*



Data Source: U.S. Census Bureau, National Association of Realtors

Charts & Analysis: WillSonn Advisory

Conclusions

- It is important to understand what types of homes are included in which categories – some categories are more intuitive than others. In addition, many housing units could be classified into more than one category, but are not. With that said…
- The number of Occupied homes in the US has largely maintained its historical growth rate, adding 8.7 million in the last ten years (2007-16), compared to 8.6 million in the previous decade (1997-2006). At the same time, the inventory of "Vacant" year round homes increased by just 0.5 million units in the last decade, versus an increase of 2.5 million units in the previous decade. This slow replenishment has likely contributed to higher home prices and rents.
- Dead flat at 75 million units for past eleven years, the impact of the current housing downturn on the number of Owner Occupied housing units has been profound and unprecedented. This has been absent from discussions by the experts, and not fully appreciated when simply looking at Owner:Renter share numbers, which have returned to 63.4%, comparable to levels from 1965-95, but well below its 2004 peak of 69%. This is not "new territory."
- Of the 17.3 million "Vacant" housing units, only 4.6 million are Year-Round homes up for sale or for rent (or both) – the rest are Seasonal homes, or Homes Held off Market, either as second homes, time shares, or some other reason. "Vacant" is not the same as "Available."
- The inventory of Vacant Homes For Sale and For Rent has clearly declined in the last decade, down a combined 1.0 million units (18%). This trend appears understated when comparing against combined NAR/CB data on the Inventory of New and Existing Homes for Sale (which also encompasses occupied homes for sale, along with Resort and Second homes for sale). The broader NAR/CB figures declined 45% over the past ten years.
- Very weak housing starts for the past nine years in the face of ongoing growth in the number of households, has driven the vacant housing inventory down faster and pushed prices up at an accelerated pace, impacting prices for both the Home Buyer and Renter markets.
- Acknowledging that we are unable to see the impact of reclassifications, it appears that the growth of Seasonal Homes has been in a long stall since the start of the current housing downturn, while the Second Home market ("Usual Residence Elsewhere") continued to grow unabated (either through construction additions or reclassification).
- The number of "Other Vacant Held off Market" homes, a vaguely defined catch-all category, appears to be well above trend, with about 750,00 excess units. In 2016, there were 7.3 million homes in the Other Vacant Held off Market category (which by definition includes only Year Round Homes), an increase of 1.1 million units above 2006 levels. In the previous decade, this category had gained only 261,000 units. I suspect that some of the 7.8 million homes foreclosed over the past ten years are quietly hiding here.
- Finally, it remains a mystery (to me) why the Census Bureau's count of households is more than 7 million higher than its count of occupied homes. Where are these 7 million+ households living – nursing homes and homeless shelters?

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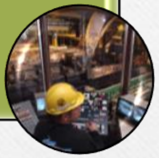

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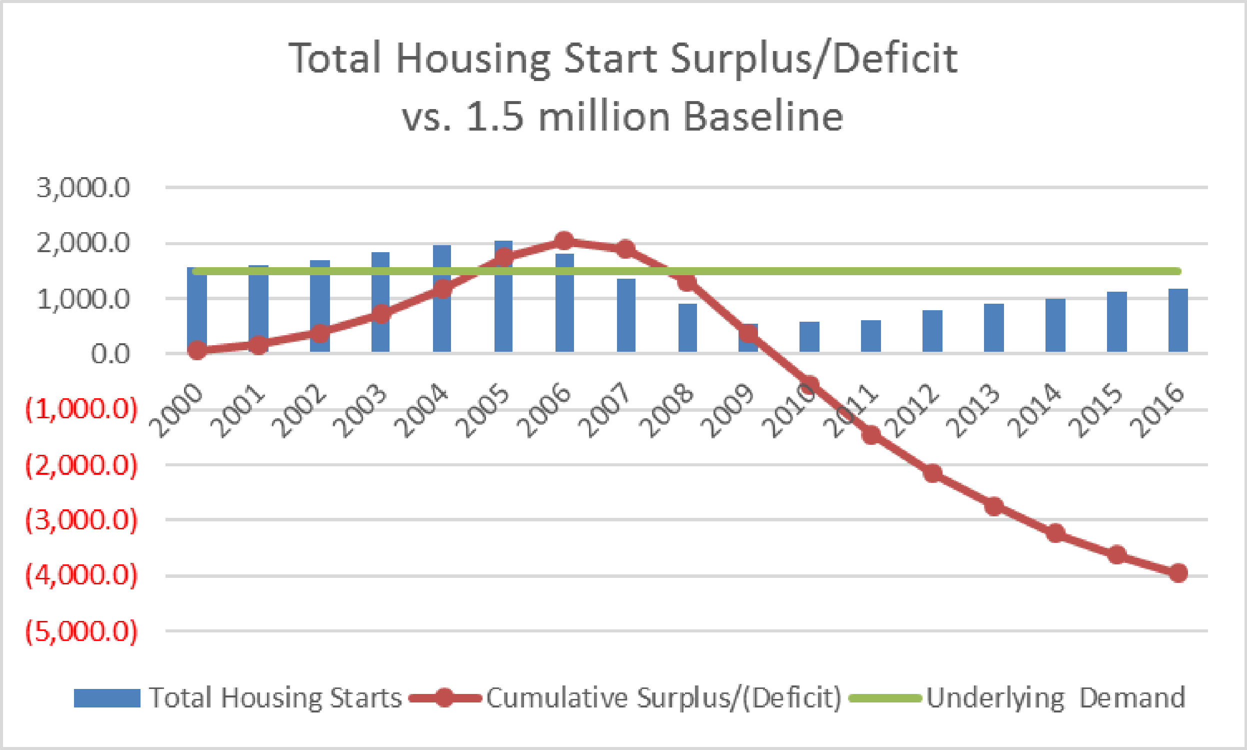
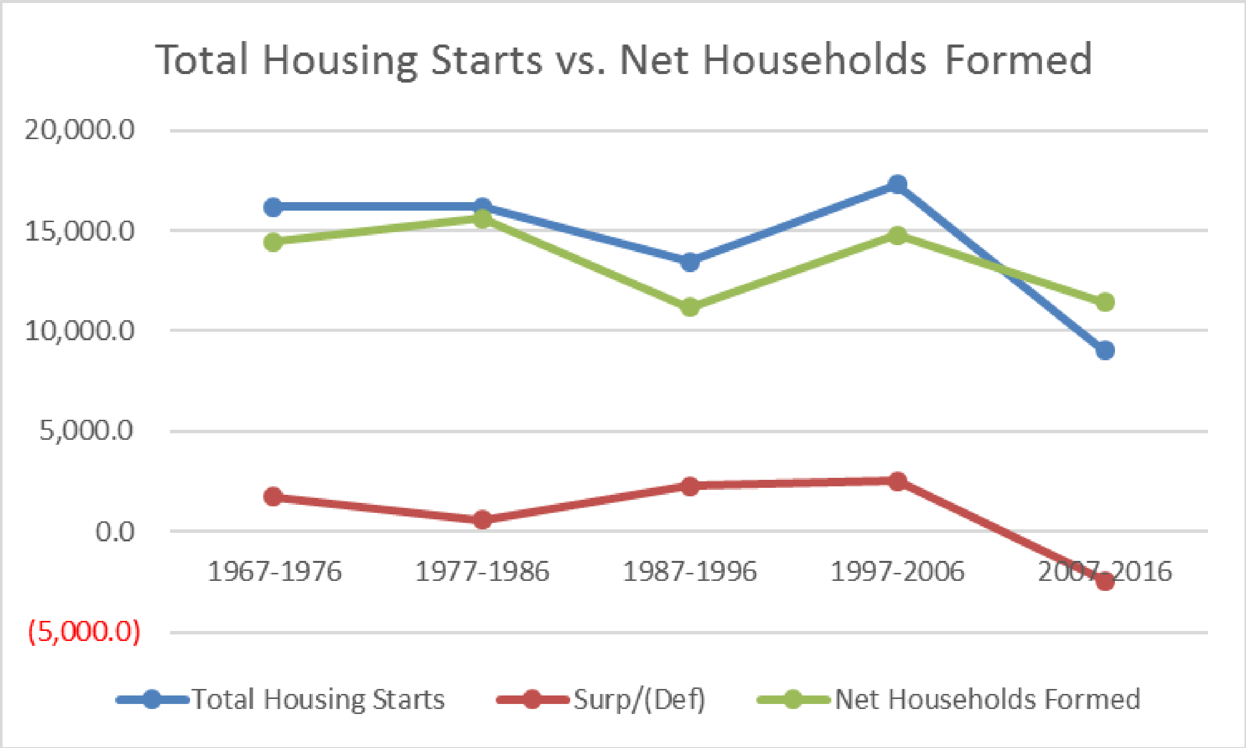
Two Measures to Gauge Pent-up Demand for Housing in the United States

An excerpt from perspectives on current market trends and indices impacting the Timber and Wood Products sectors, compliments of WillSonn Advisory, LLC



Measure #1: In this chart, I have compared Total Housing Starts against an assumed long-term underlying housing demand of 1.5 million units per year. This takes into account not only fundamental demographics, but also expectations around household formation rates, immigration trends, tear downs and replacements (voluntary or otherwise), and the demand for second homes. From 2000 to 2006, just over 2 million excess units were built. From 2007 to 2016, just over 6 million units were underbuilt. By 2010, the excess building (spent up demand) was satiated, and we began accumulating a backlog (pent-up demand). This puts the current net deficit of Housing Starts at 3.95 million units. Even if underlying demand is only 1.4 million units per year, the deficit would still be significant, at over 2 million housing units.



Measure #2: I also took a look at how the number of US households has changed over the past five decades, and I compared that to Housing Starts. In the first four decades, Starts exceeded the net change in Households by an average of 1.8 million units per decade. In the last decade it flipped, where the change in the number of households exceeded the number of housing units built, by 2.4 million units. Why the change? In the first four decades there was a steady increase in the housing unit vacancy rate (mostly homes for rent and for sale, but also second homes). From the mid '70's to 2009, the vacancy rate increased from 8.4% to 14.5%. Since 2009, the vacancy rate has dropped to 12.6%. That alone is a 1.5 million unit swing.

As a result, in the last decade we saw a deficit of 2.4 units (where the net change in households exceeded starts) versus an average surplus of 1.8 million units in the first four decades (where starts exceeded the net change in households), **a 4.2 million unit swing**. This juxtaposition may also help explain the run up in home prices that we have seen for both existing and new homes, as well as increases in rents. Both of these price increases reflect constraints on supply.

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Residential Construction Employment & Productivity

An excerpt from perspectives on current market trends and indices impacting the Timber and Wood Products sectors, compliments of WillSonn Advisory, LLC

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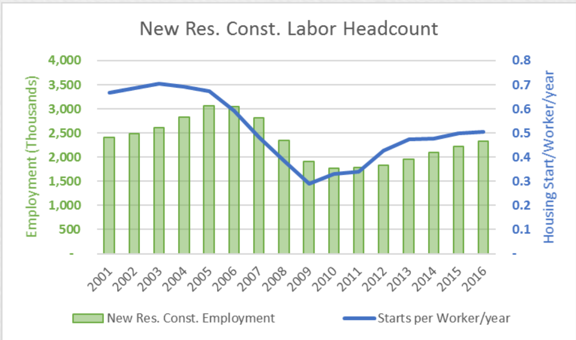
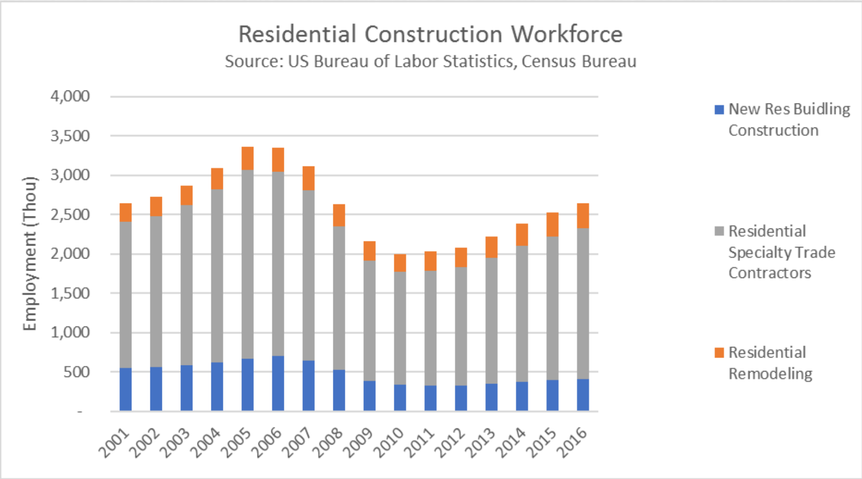
Introduction

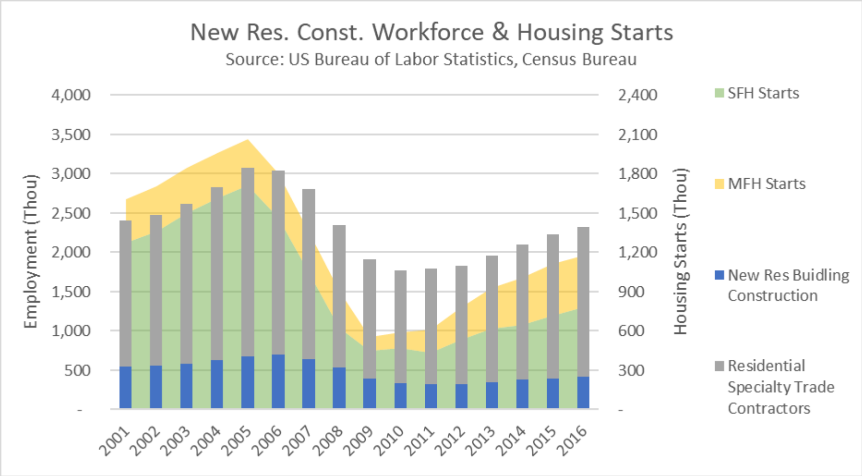
- A common narrative we hear as a contributing factor to the sluggish recovery in Housing Starts is that there are not enough workers coming into the building trades. This claim is often bolstered by the high number of unfilled job postings. But there may be other factors at play, such as productivity. I have long been interested in this - employment and productivity in housing - and will explore a number of ways to measure productivity.
- The Employment figures presented in this presentation are expanded from what is typically discussed. In addition to Residential Building Construction (NAICS 2361), which includes Single and Multi Family builders along with Remodeling contractors, I have also added Residential Specialty Trade Contractors (part of NAICS 238), which includes plumbers, electricians, framers, and other independent contractors.
  - BLS breaks out those Specialty Trade Contractors involved in Residential Construction, which excludes non-Residential contractors from NAICS 238 such as road construction workers, industrial equipment installers, etc.
  - In most charts on the following pages (except page 6), I have removed Remodelers from NAICS 2361.
- Together, I think of workers in Residential Building Construction and Residential Specialty Trade Contractors as the “pool” of construction workers available to both the new home and remodeling sectors, since Specialty Trade Contractors can and do work in either new home construction or remodeling. One could make a similar argument that Remodeling contractors sometimes work on new home job sites, but I suspect this is less prevalent.
- If you would prefer to have additional context as you go through these slides, please feel free to skip ahead and read the “Conclusions” on page 7.

Residential Construction Workforce

- This more complete measure of the workforce in Residential Construction shows that **Total Residential Construction Headcount in 2016 equaled 2001 levels** (2.64 million individuals).
- In contrast, housing starts in 2001 totaled 1.60 million units, versus 1.17 in 2016.
- Excluding Remodelers, we had 2.406 million workers in 2001, and 2.326 million in 2016. That translates to 0.67 start/worker/year in 2001-06 period, versus 0.5 start/worker/year in 2016, a 25% decline in starts per year.





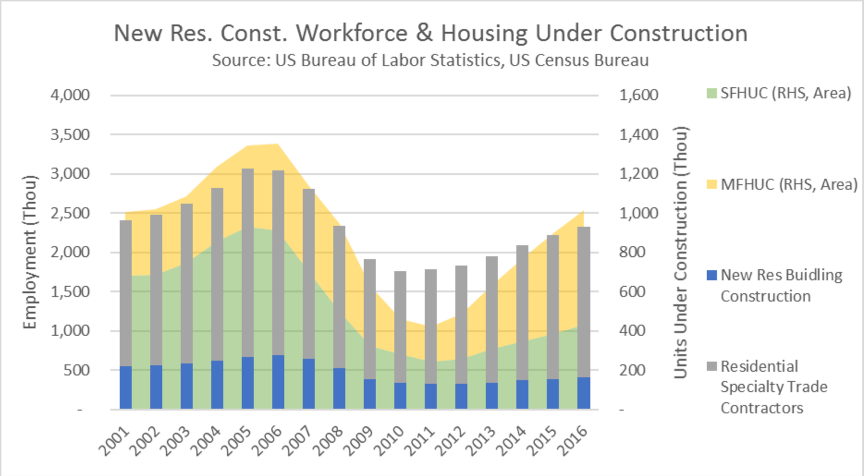


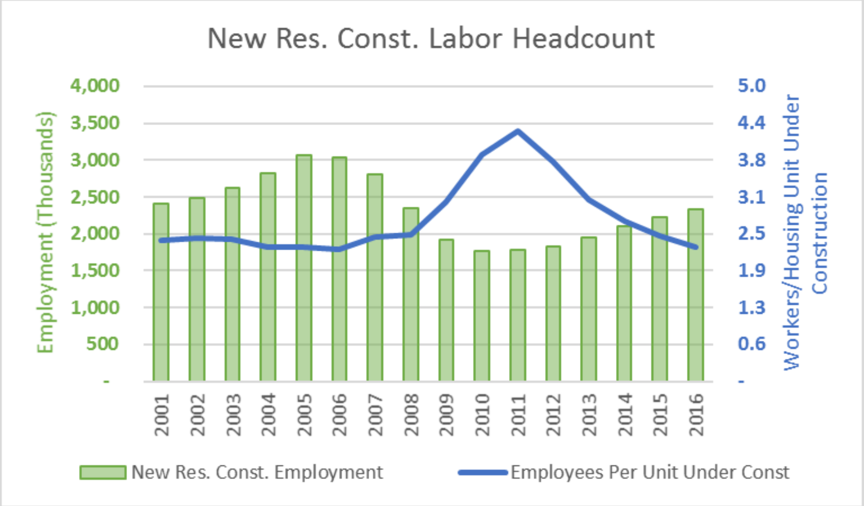
Data Source: U.S. Census Bureau, Bureau of Labor Statistics

Charts & Analysis: WillSonn Advisory

Housing Units Under Construction

- But, do Housing Starts provide the best reference point?
- In the top chart, I replaced Housings Starts with Housing Units Under Construction,. Looking at units "Under Construction" takes into account not only the pace of housing starts, but also the duration of housing construction.
- This gives us a different picture of worker productivity, shown in the bottom chart. In 2016, there were about 2.28 people per unit under construction, close to the 2001-06 level of 2.34. This suggests that given the number of homes under construction, maybe we have enough workers. Maybe the problem is that we have too many homes under construction!
- *As an aside, I also found it striking that of all housing units under construction, 58% are Multi-family units, versus 32% during 2001-06. This is not only due to the growth of the Multi-family sector to a third of Total Housing Starts (up from <20%) but also due to longer construction (or inspection) times required for multi-family units. This may also portend a huge surge in the number of completed Multi-family units hitting the market in the next year or two.*



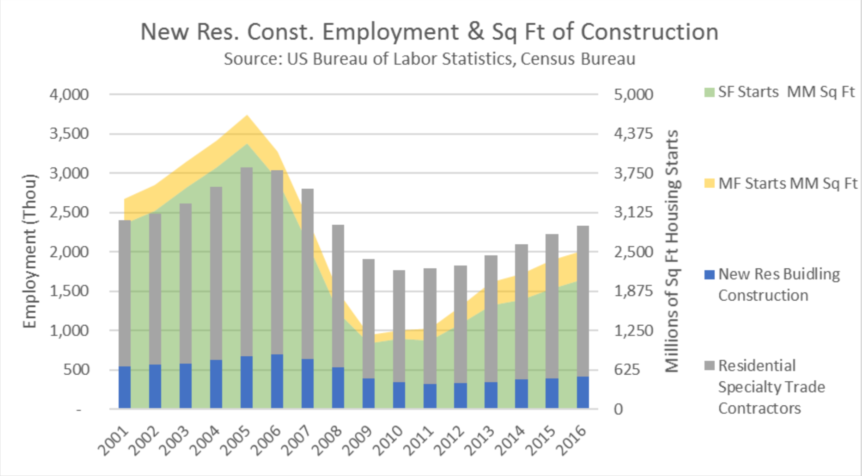


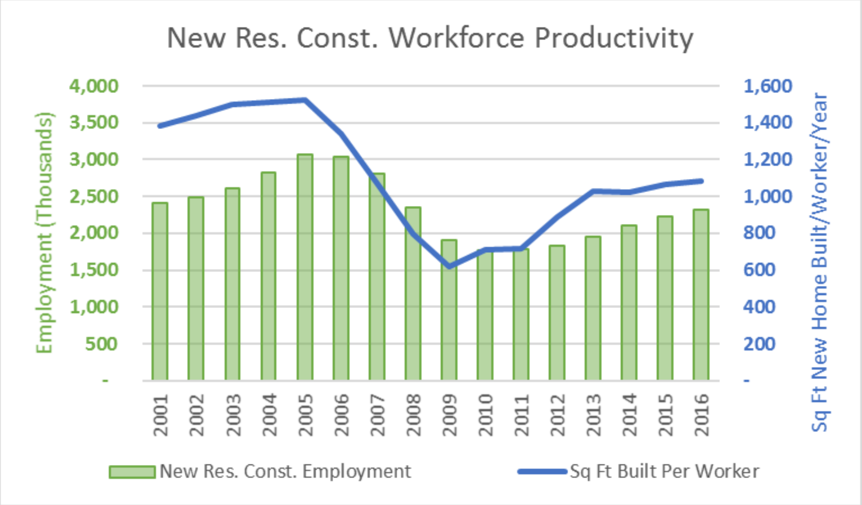
Data Source: U.S. Census Bureau, Bureau of Labor Statistics

Charts & Analysis: WillSonn Advisory

Square Feet of Housing Construction

- But, neither Housing Starts nor Units Under Construction captures the change in the size of homes.
- Furthermore, "Productivity" is probably best measured using units of Output or Input, not Work In Progress. Since I am a timber guy, and most lumber is used at the front end of the building process, I think Starts serves as the most relevant proxy for productivity.
- Using this measure of "productivity," square feet of construction per worker per year was 1,082 sq ft in 2016. This compares to 1,450 sq ft in the 2001-2006 period, so a 26% decline compared to 10 years earlier.
- Despite larger houses, this is about the same decline in productivity using the simpler method of starts/worker, on page 3.
    - The gain in Single Family home size has been offset by the higher share of Multi Family units, which made up 19% in 2001-2006, vs. 33% in 2016
    - While the average size of a Single Family Start has grown 14% since 2001, Multi Family unit size has shrunk 2%



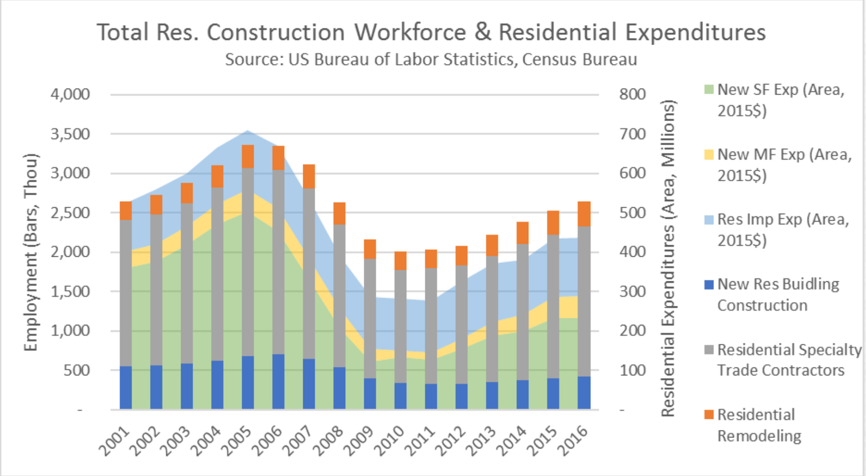


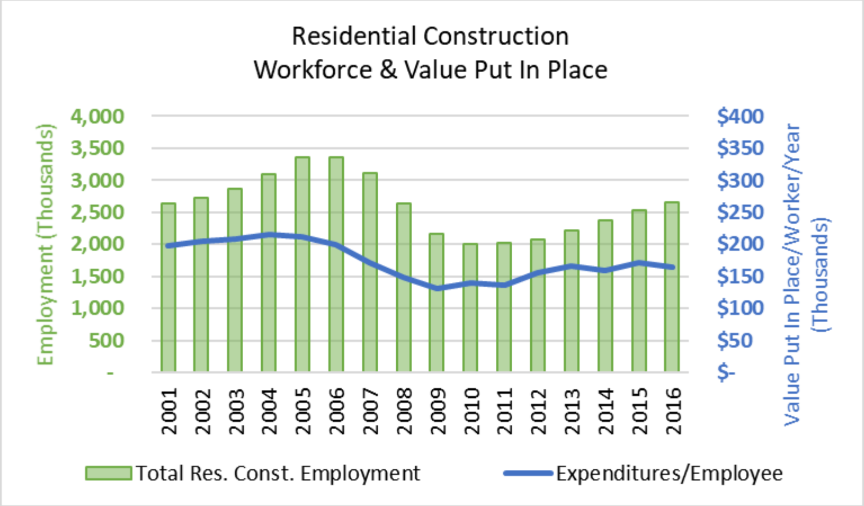
Data Source: U.S. Census Bureau, Bureau of Labor Statistics

Charts & Analysis: WillSonn Advisory

Residential Expenditures

- The charts on the previous page do not capture Remodeling activity, which is hard to capture in any unit other than Dollars.
- Residential Construction Expenditures are expressed here in real dollar terms, $2015, using the Census Bureau Construction Price Index.
- Construction Expenditures per worker per year provides another measure of worker productivity that allows for the Specialty Trade Contractor participating in both sectors (new construction and remodeling).
- Over the last five years, we spent only 79% of the dollars per Construction Worker, compared to the 2001-06 period (recently about $164k/employee, versus $206k/employee in 2000-06). That's 21% lower, and the trend is pretty much flat.
- Note that in inflation adjusted dollars, Improvement Expenditures are about the same compared to the early 2000's. It may be that the Improvement/Remodel sector has siphoned off a disproportionate share of the Specialty Trade workforce.





Conclusions

- It appears to me that the issue is less about the number of people in the building trades. It is more a matter of productivity, which comes from experience, training.
  - We have nearly as many people working in Residential Construction and Residential Specialty Trade as in 2001
  - On a "Per Worker Per Year" basis, we see 25% fewer homes being started, 26% fewer square feet getting built, and 21% fewer dollars being spent after adjusting for inflation, compared to the 2001-06 time period
- While Housing Starts lag the early 2000's, the number of Homes Under Construction is back to where it was in 2001
  - A higher share of Multi family units, and increasing construction times, have slowed throughput
- Factors other than those mentioned may also be at play
  - Increased regulation may be slowing down permitting and inspections
    - Post Global Financial Crisis, local government employment (including inspectors) remains low
    - Probably a bigger issue with Multi-Family construction, where completion times are now 12.9 months
  - A dearth of available, permitted lots on which to build reduces the urgency to move onto the next job
    - Conservation Easements and purchases by park districts of urban and suburban open lands further reduce the number of lots available for new housing
  - Headcount is one thing, but hours worked per day, and days worked per week may or may not be at the same level as it once was. This would certainly reduce productivity, as I have measured it.
- I hope I have provided you with a new perspective or two, and look forward to receiving your comments

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