US Housing Market Update: Changing Dynamics

Timberland Investment Group

2018

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US Housing

The US housing market is one of the pillars of the US economy comprising close to 4% of US GDP.[1] Aside from directly contributing to economic growth, US housing supports many related sectors including wood products and timber. In aggregate, residential construction comprises around 30% of demand for US softwood lumber and 42% of demand for US panels.[2] The US housing market suffered a significant decline during the Great Recession, but has been improving since 2010. That said, the increase in housing starts has moderated in recent years as a number of headwinds have prevented the industry from reaching its full potential.

There are a number of key trends that deserve attention. In particular, the composition of housing starts has changed, with multi-family comprising a greater proportion of total starts than it has historically, a trend that needs to be monitored as multi-family units utilize 60-70% less wood than single-family homes given shared walls and exteriors. However, Millennials, whose ages currently range between 20 to 38, have become the largest generational group of home buyers over the last five years. In addition, the age of the existing housing stock has increased, requiring either refurbishment or a complete rebuild, a potential positive for wood products and timber demand.

Housing growth followed by housing depression

During the early 2000s, housing starts accelerated given rising house prices, loose lending standards (e.g., banks were less concerned with credit worthiness), and an increase in subprime mortgages.[3] Moreover, banks repackaged mortgages into different types of mortgage-backed securities[4], which helped fuel mortgage issuance and the broader housing market. As a result, housing supply[5] increased at a faster pace than demand[6], leading to a glut of new homes (Figure 1).

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[1] This number reflects the construction of new single-family and multi-family structures, residential remodeling, the production of manufactured homes, and brokers' fees

[2] RISI

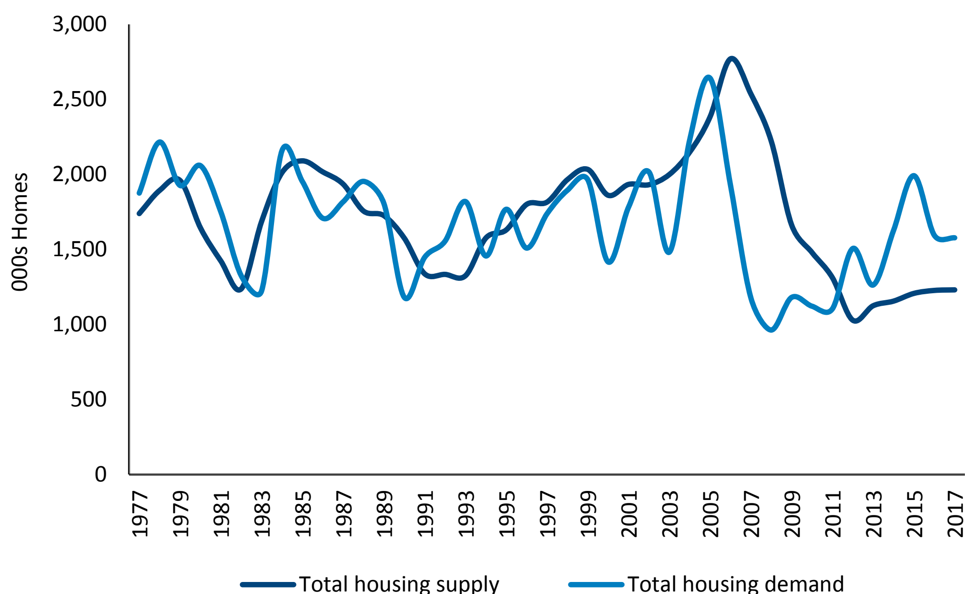
[3] Subprime mortgages are mortgages extended to borrowers with lower credit ratings due to poor credit histories, questionable income sources, or elevated debt-to-income ratios

[4] A derivative investment secured by mortgages

[5] Housing supply reflects the aggregation of new housing completions, new manufactured (mobile) homes, and excess vacant for sale homes (the vacancy level above the average vacancy rate from 1975-2005)

[6] Housing demand reflects the sum of household formations (calculated as population growth multiplied by the headship rate [the number of households divided by the adult population]) and second homes less assumed annual demolitions

Figure 1: Housing Supply versus Demand



Sources: US Census Bureau; TIG Analysis

In mid-2007, the US housing market began to soften, in part as interest rates increased and homeowners who utilized adjustable rate mortgages saw their interest payments reset at higher levels. As the housing market slowed, home values plummeted, in many cases declining below outstanding mortgage face values. Many homeowners chose to default on their mortgage rather than pay for a home that had lost significant value. This housing crisis ultimately fed into a broader economic crisis resulting in the Great Recession and increasing unemployment. In 2007, 2008, and 2009, housing starts precipitously declined -25.9%, -32.9%, and -38.4%, year-over-year, respectively.

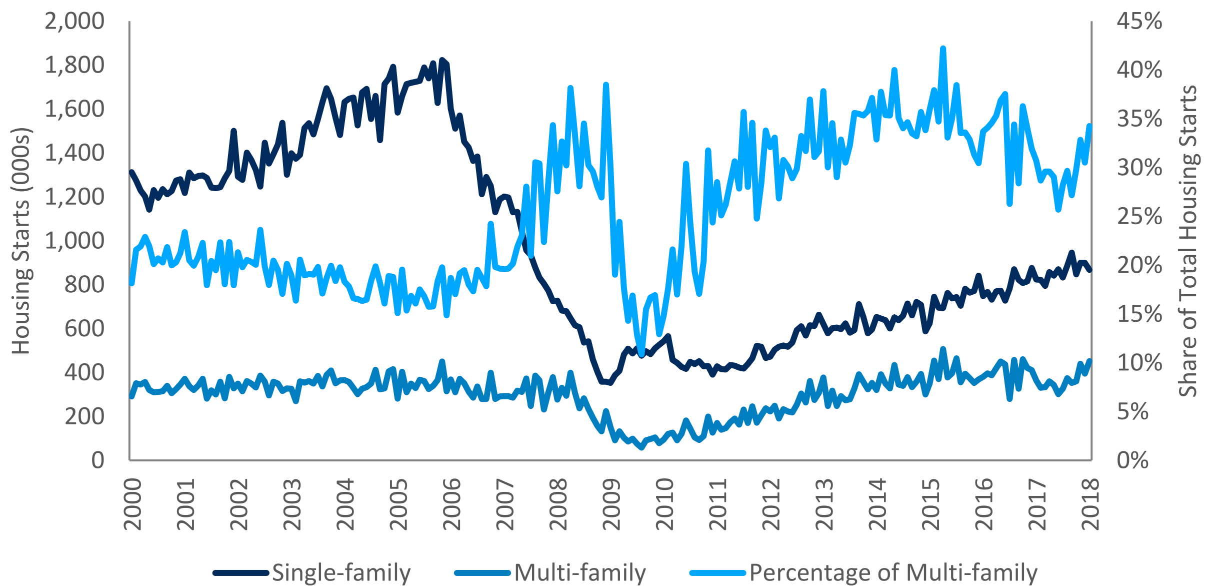
Slowly improving housing environment, though with a different mix

In 2009, the US government tried to stimulate housing demand with a “New Home Buyer Tax Credit” that was successful in the short-term, but demand ultimately subsided once the credit expired. It was not until mid/late 2011 when housing demand began to rebound in earnest, as depressed home prices and a slowly improving economy incentivized buyers. New home construction accelerated in 2012 and 2013, increasing 28.1% and 18.4%, year-over-year, respectively, given low interest rates, declining new and existing home inventories, and continued economic improvement (Figure 2). That said, housing start growth has since moderated (6.3% year-over-year in 2016 and 2.5% year-over-year in 2017).

Meanwhile, the mix of starts has been more weighted towards multi-family as compared to single-family homes. On average, multi-family has comprised at least 30% of starts since 2012 versus a historical average of around 20% from 1991 to 2006. The increase in the proportion of multi-family starts could be a sign that potential

homeowners, particularly those who are at the point of buying their first homes, prefer to rent rather than own. Other factors may include a trend of home buyers choosing to live a more urban, "multi-family" lifestyle rather than a "single-family" suburban lifestyle. This trend may also indicate that home prices, which continue to increase, and lending standards, which remain somewhat tight, may still be keeping a number of first-time buyers out of the market.

Figure 2: US Housing Starts (SAAR)



Sources: US Census Bureau

Excess supply absorbed

Despite the significant overbuilding that occurred leading up to the Great Recession, a good portion of that excess supply was absorbed by 2012, primarily driven by private equity firms like Blackstone and other single-family home investors as well as slowly improving demand. Today, home supply is relatively tight. In July, inventories of new homes were at 5.9 months of supply while inventories of existing homes were at 4.3 months of supply, both considered low levels of inventory by historical standards (Figure 3). The lack of existing home inventory is particularly important as potential buyers have less of an opportunity to buy an existing home and may therefore be motivated to purchase a new home, aiding starts.

Figure 3: Months of Supply of Existing Homes

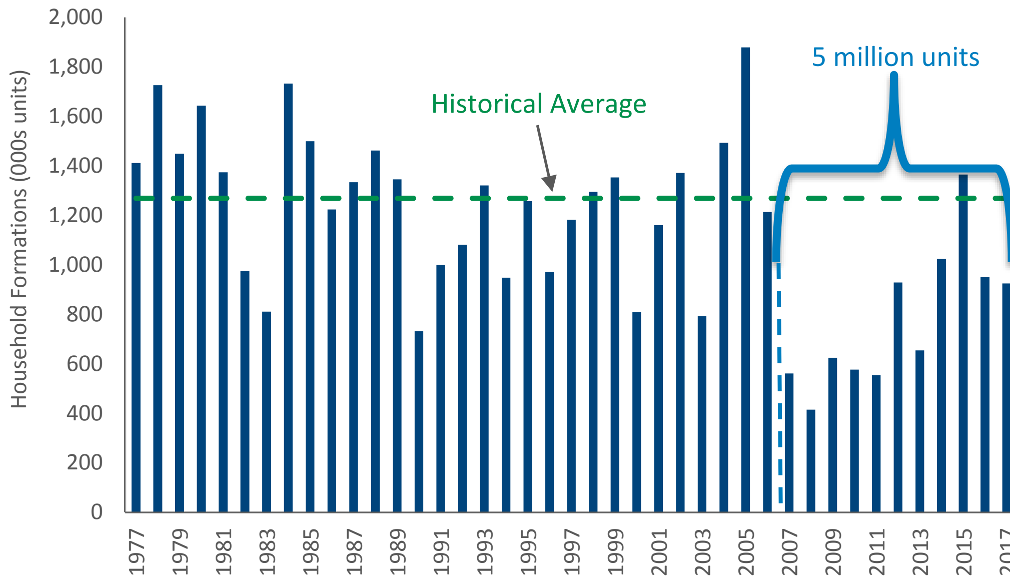
Sources: National Association of Realtors

Pent-up housing demand

Given the Great Recession and other factors such as lower levels of immigration, household formations notably slowed. As such, there are currently over 5 million units of pent-up household formations (Figure 4). Pent-up demand is calculated by aggregating the annual shortfall in household formations from 2007 to 2017 versus the long-term average of around 1.2 million formations per year. That said, the rate of change in household formations has improved over the last several years given the strong economy. To the extent that the economy continues to accelerate in the short-term, households could continue to form, driving even more demand for US housing.

In addition, despite still elevated multi-family starts, single-family starts have begun to comprise an increasing amount of total housing starts in recent months. Single-family starts comprised around 70-72% of total housing starts in the first half of 2018, greater than the 65-70% share from 2012 to 2016.

Figure 4: Deferred Household Formations



Sources: US Census Bureau; TIG Analysis

Age of existing housing stock

As a result of the housing crisis, the US has experienced an increase in the age of its housing stock. The median age of owner-occupied housing has increased to 37 years in 2015 from 31 years in 2005 (Figure 5) with over 65% of owner-occupied housing built prior to 1989 (Figure 6). One of the principle reasons for this age increase is new construction, which has been stymied by a myriad of factors including labor, lot, and credit availability, the land entitlement process, wage growth, student debt, and affordability (please refer to the headwinds section below).

Figure 5: Median Age of Owner-Occupied Housing

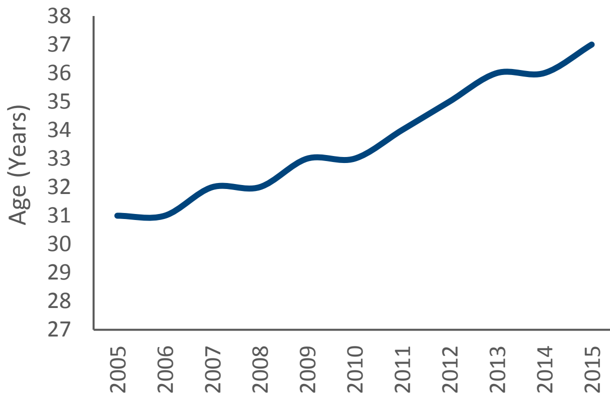
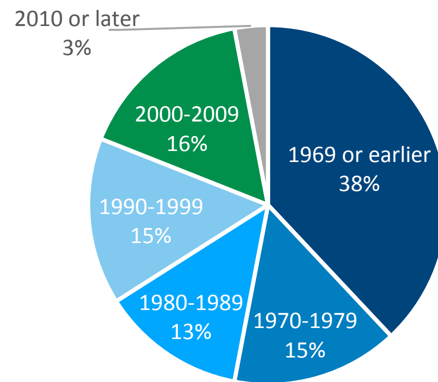


Figure 6: Share of Owned-Occupied Housing by Year Structure Built



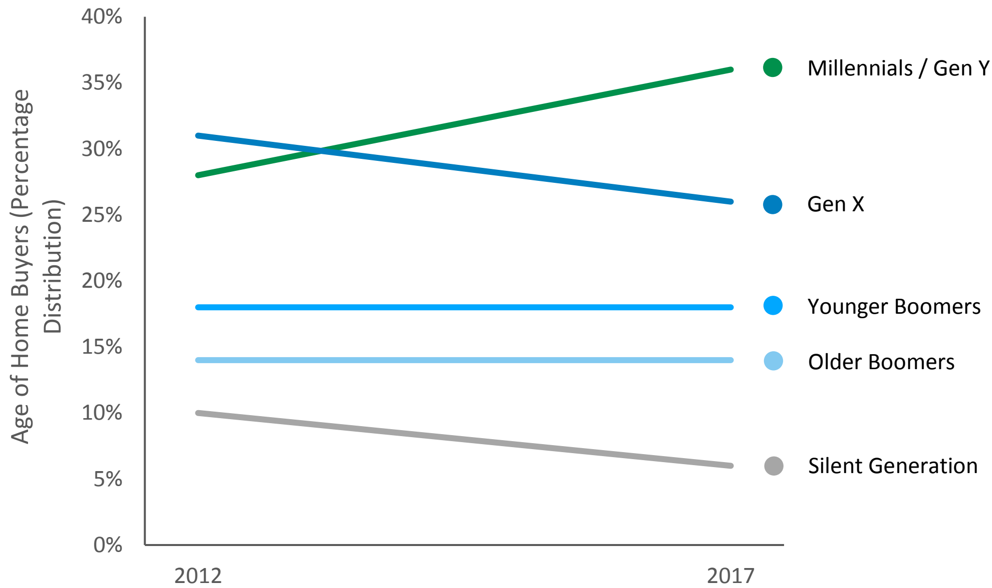
Sources: National Association of Home Builders

Millennials: an unexpected housing demand driver

Since the end of the Great Recession, there have been concerns that Millennials (generally defined as individuals born between 1980 and 1998) would be more inclined to rent than to own single-family homes as many of them came of age during the housing meltdown. Further, given modest job growth and restrictive credit (higher down payments, elevated FICO score requirements, etc.) post-Great Recession, there were concerns whether Millennials would actually be able to afford single-family homes. Last, given that Millennials tend to be more mobile, their lifestyles would favor more urban living (multi-family) as opposed to suburban (single-family) living.

Despite all of the aforementioned concerns, Millennials have actually been the largest generational group of home buyers over the last five years. Millennials comprised 36% of buyers in 2017, up from 34% in 2016 and 28% in 2012 (Figure 7), partially attributable to the aging of the Millennial cohort.

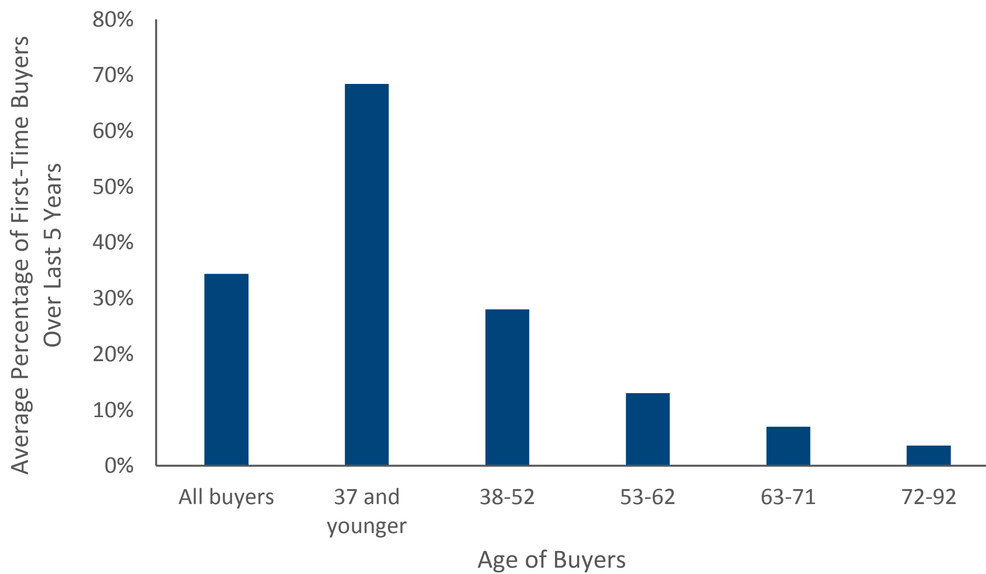
Figure 7: Age of Home Buyers



Sources: National Association of Realtors

Importantly, Millennials comprise a large portion of first-time home buyers with 65% of Millennial home buyers being first-time buyers in 2017. Over the last five years, around 68% of Millennial home buyers have been first-time buyers (Figure 8).

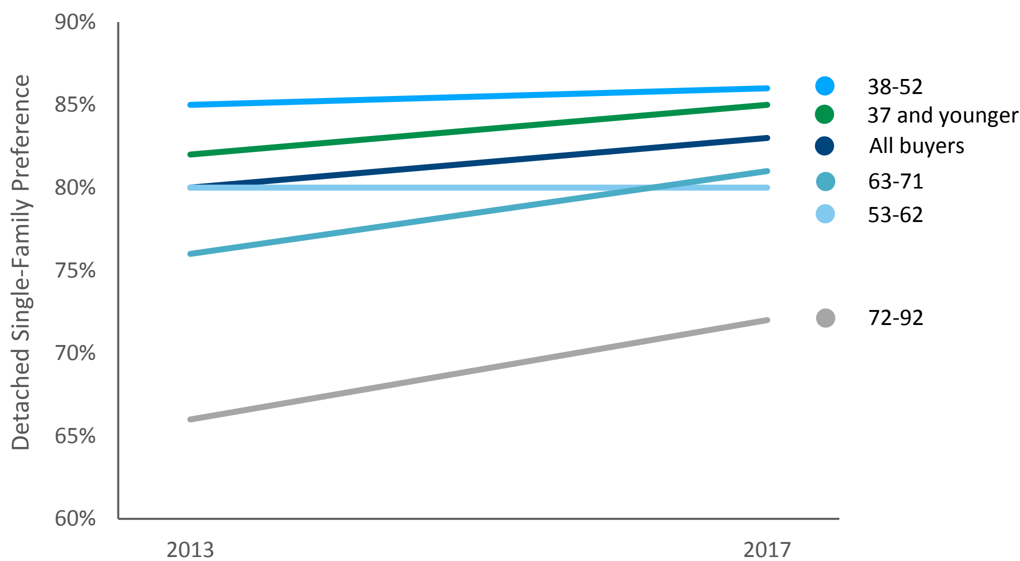
Figure 8: Millennials Have Comprised a Large Portion of First-Time Home Buyers



Sources: National Association of Realtors; “All buyers” reflects all home buyers regardless of age cohort

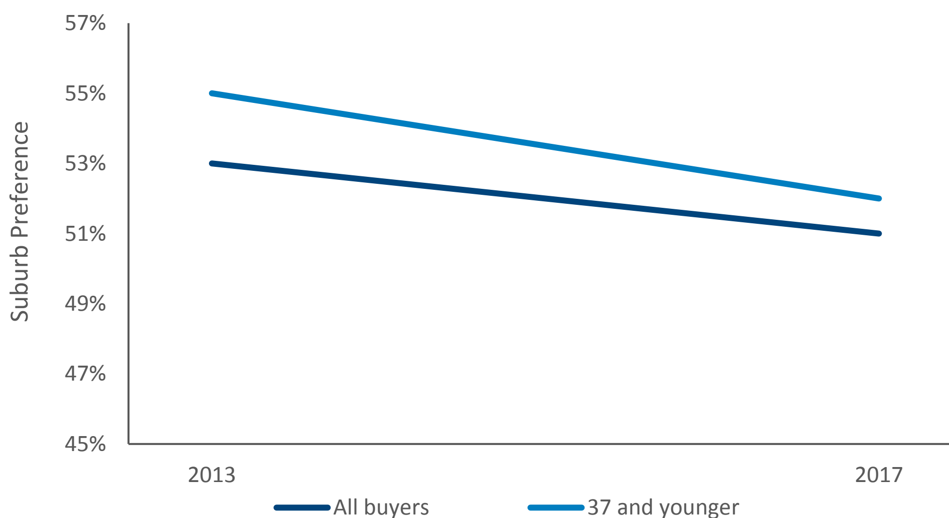
Similarly, most Millennial buyers purchased single-family detached homes in suburban locations. Around 85% of Millennial buyers prefer single-family detached homes versus 83% for all age cohorts (Figure 9) while 52% of Millennial buyers prefer the suburbs (Figure 10). Given that the Millennial cohort comprises more than 80 million individuals, this group is likely to meaningfully contribute to future housing and wood products growth.

Figure 9: Millennials Prefer Detached Single-Family Homes



Sources: National Association of Realtors; "All buyers" reflects all home buyers regardless of age cohort

Figure 10: Millennials Have a Greater Desire to Live in the Suburbs vs. Other Cohorts



Sources: National Association of Realtors; "All buyers" reflects all home buyers regardless of age cohort

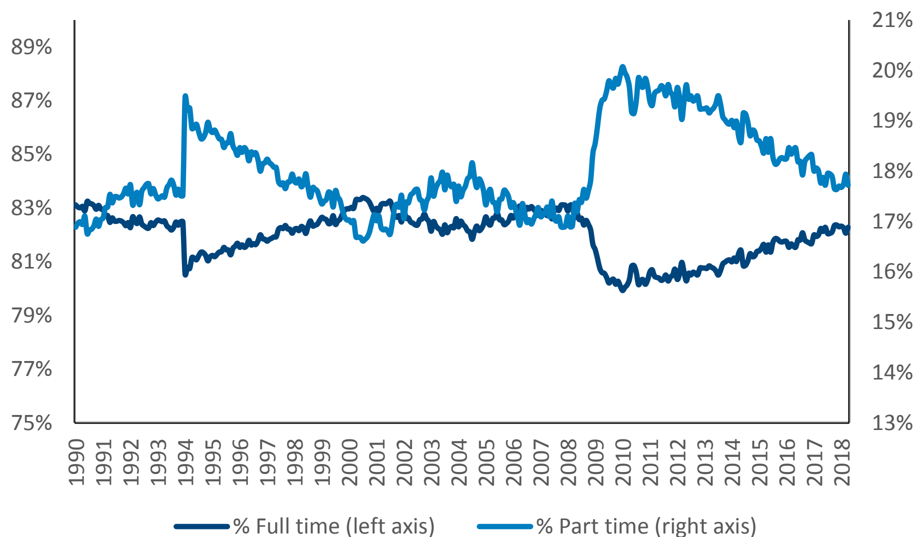
Headwinds constraining a more robust housing recovery

While the housing market continues to improve, there are also a number of factors inhibiting a more meaningful housing recovery from materializing including: 1) labor availability, 2) lot availability, 3) credit availability, 4) land entitlement process, 5) wage growth, 6) student debt, and 7) affordability.

Labor availability

A significant factor that has stymied a more robust recovery has been labor availability. Between 2006 and 2016, the construction industry lost around 980k jobs, equating to a compounded annual rate of decline of -1.4%. Even though the Bureau of Labor Statistics is forecasting that the US will add around 860k construction jobs over the next decade, this is still 120k jobs below where the construction industry had been historically. Moreover, while overall job growth has occurred in the broader economy with over three million jobs added since the beginning of 2017, concerns exist as to the quality and earnings power of these jobs given elevated part-time employment (Figure 11). As such, individuals may not have the financial wherewithal to afford homes.

Figure 11: Part-time Employment Still Elevated, Though Starting to Normalize



Sources: US Bureau of Labor Statistics

Lot availability

Lot availability has also been an issue constricting the housing recovery as a number of prime lots have already been bought and/or developed. During and immediately following the Great Recession, a number of homebuilders made opportunistic land purchases, often buying land at a fraction of the cost of what they would have paid prior to the crisis. To get access to additional prime lots, homebuilders have sought to acquire one another – Lennar bought WCI Communities and CalAtlantic, which itself was a merger of Standard Pacific Homes and Ryland, while DR Horton acquired Wilson Parker Homes, Pacific Ridge Homes, Crown Homebuilding, Regent

Homes, and Breland Homes. Other homebuilders have also been acquiring peers in order to gain access to additional lots. Separately, lot availability has been negatively impacted by the land entitlement process – please see section below.

Credit availability

Following the Great Recession, lenders increased their underwriting standards to comply with new federal rules aimed at minimizing defaults by mandating that borrowers have more than adequate ability to pay (Figure 12). This led to increased FICO scores and higher down payments. While credit availability has improved since 2013, it still remains well below the peak reached in 2006 and is unlikely to return to pre-crisis levels (Figure 13).

Figure 12: MBA Mortgage Credit Availability is Lower versus History[7]

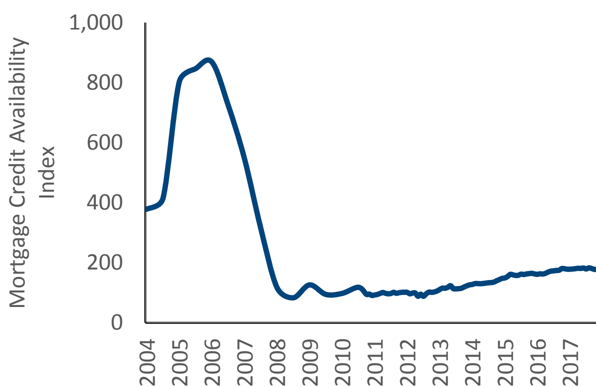
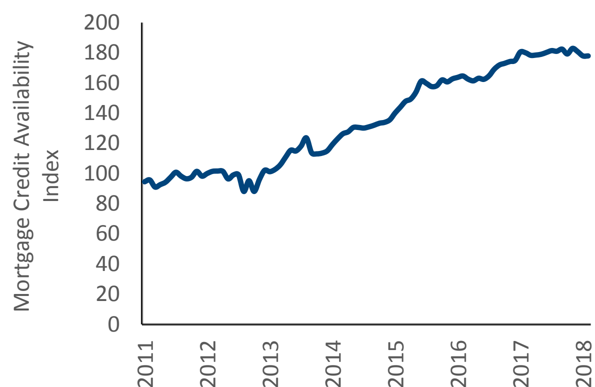


Figure 13: Availability has Improved since 2013[8]



Sources: Mortgage Bankers Association

Land entitlement

Land entitlement, the localized process by which land is developed for a specific use (e.g., converting raw land into finished lots, permitting finished projects, etc.) has also served as an impediment during this housing recovery. Budget constraints in many municipalities have caused local entitlement departments to be understaffed, lengthening the time it takes to convert raw land into finished lots. Given that many homebuilders are unwilling to assume entitlement risk and prefer to buy fully entitled land or finished lots, this has resulted in greater build times. Similarly, a lack of inspectors to monitor and approve project progress has extended construction times and inhibited the ability of homebuilders to move onto new projects.

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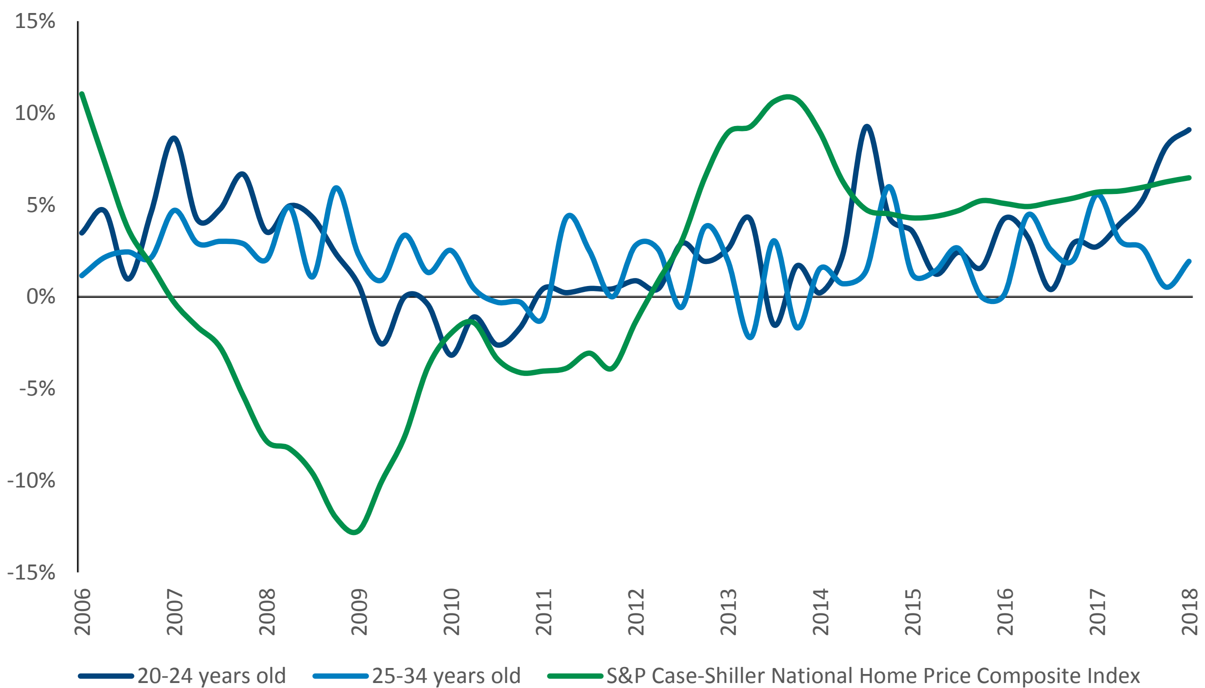
[7] The Mortgage Credit Availability Index is a risk-weighted measure of investor offerings to purchase mortgages or mortgage credit risk. A decline in the index indicates that lending standards are tightening while increases in the index are indicative of loosening credit

[8] Figure 13 reflects the same data as Figure 12, although it begins in 2011 in order to show the improvement in credit availability that began in 2013

Wage growth

Despite an improving labor market, wage growth is a potential headwind that has prevented a more pronounced housing recovery. While aggregate wage growth has trended positive for the last 15-20 years, the first-time home buyer cohort actually experienced wage declines after the Great Recession and in the early stages of the recovery. While first-time buyers have seen more notable wage growth the last several quarters, they will still need to experience continued wage improvement in order to make-up for those prior wage losses. Further, recent wage gains have trailed continued home price appreciation making it challenging for first-time buyers to actually afford homes (Figure 14).

Figure 14: Year-over-Year Change in Median Usual Weekly Earnings vs. Home Price Appreciation



Sources: US Bureau of Labor Statistics; S&P Case-Shiller

Student debt

Student loans have also been another barrier for home ownership, dissuading younger age cohorts by limiting the amount of disposable income available to make monthly principal and interest payments. Such debt makes it more challenging for borrowers to actually receive a mortgage given lender cautiousness concerning ability-to-pay. In 2015, around 34% of student loan borrowers had more than US$ 25,000 in student debt versus 30% in 2012 and 18% in 2005 (Figure 15). Moreover, 64% of student loans are held by individuals 39 years old or younger (Figure 16). While these numbers do not appear to bode well for future homeownership, TIG believes that student debt is more likely to delay the timing on future homeownership rather than completely eliminate it.

Figure 15: Distribution of Student Loan Borrowers by Balance

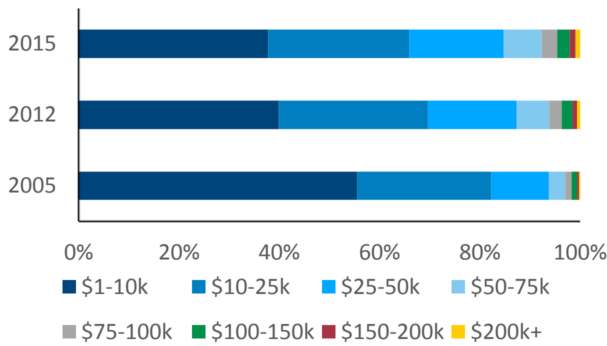
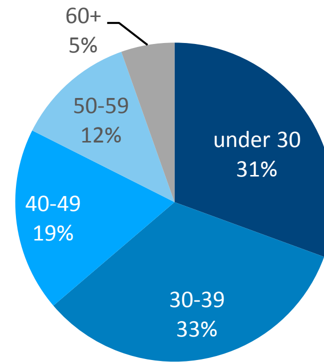


Figure 16: Total Student Loan Balances by Age Cohort



Sources: Federal Reserve Bank of New York Consumer Credit Panel / Equifax

Affordability

Given rising home prices and increasing interest rates, home affordability has declined (Figure 17). The National Association of Realtors Composite Affordability Index ("NAR")[9] peaked in 2012 and has since softened indicating that it is becoming more challenging for potential buyers to afford homes. Since early 2012, home prices have increased at a 6.6% compounded annual growth rate ("CAGR") (Figure 18). Meanwhile, the rate on the 30-year fixed mortgage has increased over 50 basis points since the beginning of 2016 to 4.50%, the highest level in 4-5 years (Figure 19). If prices and interest rates continue to increase, they could continue to negatively impact affordability and ultimately housing demand.

[9] The National Association of Realtors Composite Affordability Index measures whether a typical family could qualify for a mortgage loan on a typical home. The typical family is defined as one earning the median family income as reported by the US Census Bureau. The typical home is defined as the national median-priced, existing single-family home as calculated by the NAR

Figure 17: Housing Affordability has Declined

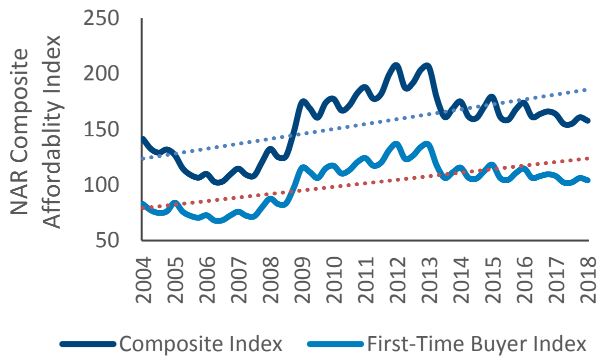


Figure 18: Home Prices Continue to Increase

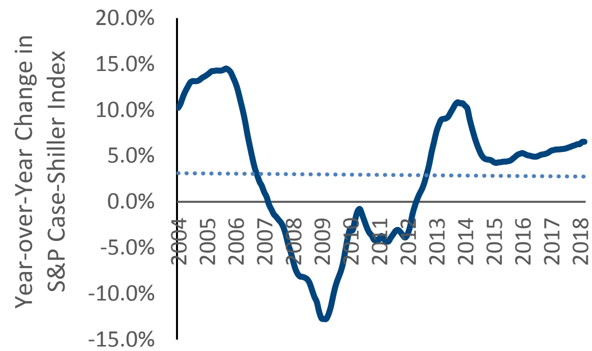


Figure 19: 30-year Mortgage Rate is on the Rise

Sources: S&P Case-Shiller; National Association of Realtors; Mortgage Bankers Association

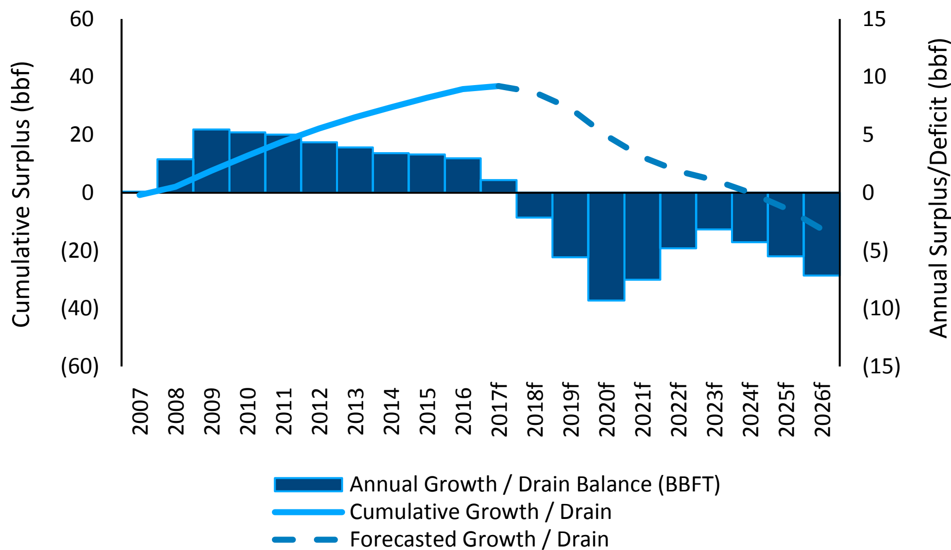
Implications for wood products and timber

Housing is one of the most significant drivers of wood products and timber demand. Based on TIG's analysis, on average, each single-family home (typically found in suburbia) consumes around 15,000 board feet of softwood lumber and 10,000 square feet of panels (~3,100 board feet) while each multi-family unit (typically found in more urban settings) consumes around 5,000 board feet of softwood lumber and 3,000 square feet of panels (~930 board feet). In terms of logs, each single-family home utilizes around 36,000 board feet while each multi-family unit utilizes close to 12,000 board feet. In aggregate, housing (residential construction) comprises around 30% of demand for US softwood lumber and 42% of demand for US panels.

As noted above, the housing market continues to improve, though at a gradual pace. This gradual improvement, as compared to a more robust recovery, has added to the sawtimber inventory overhang already present in the US South as inventory growth continues to outpace harvests. Given the housing downturn and subsequent timber harvest deferrals as timberland owners looked to support pricing, there has been a significant increase in sawtimber inventory. As we have noted in prior research ("US South Sawtimber Overhang", 2017), we

believe that it could take another six to seven years for this inventory to be worked through, assuming no change in overall housing and general economic conditions (Figure 20).

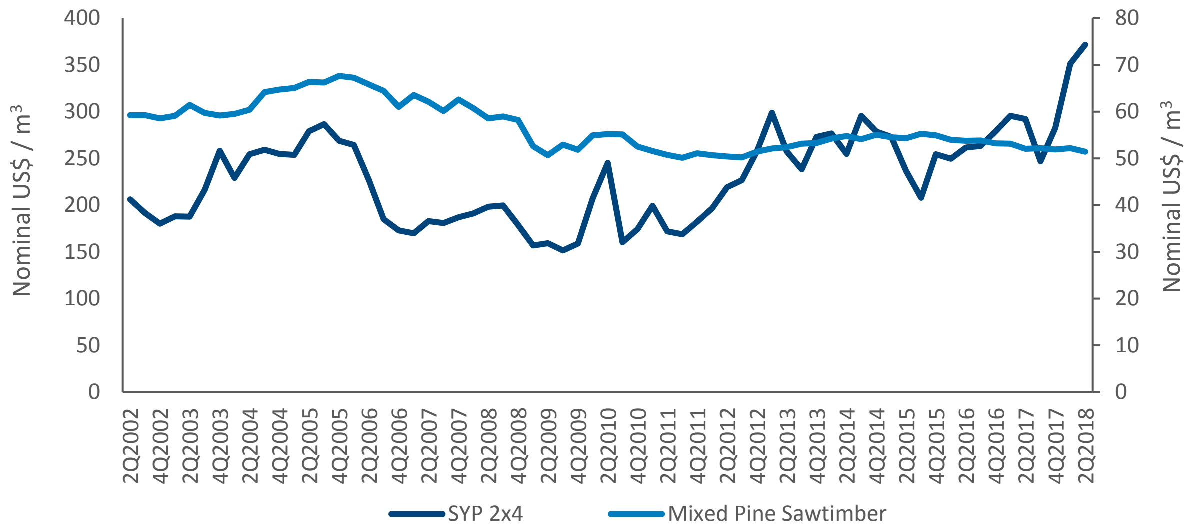
Figure 20: US Southern Sawtimber Surplus/Deficit & Forecast



Sources: RISI; TIG hypothetical forecasts

Importantly, excess US South sawtimber inventories have resulted in depressed sawtimber prices. Since mid-2012 (36 months after the end of the Great Recession), southern mixed pine sawtimber prices have only increased 3.1% to US$ 23.65/ton. Meanwhile, softwood lumber prices have increased 42.5% to US$ 453/mbf (Figure 21). Prior to the Great Recession, higher softwood lumber prices ultimately resulted in higher sawtimber prices. Since the Great Recession, this relationship has weakened primarily due to elevated sawtimber inventories. Unlike the timber market, there is not a glut of inventory in wood products serving as an overhang with many producers and dealers making concerted efforts to maintain lean inventories. Given that we expect the sawtimber inventory overhang to last an additional six to seven years, we believe that southern sawtimber prices will only experience modest appreciation in the near-term.

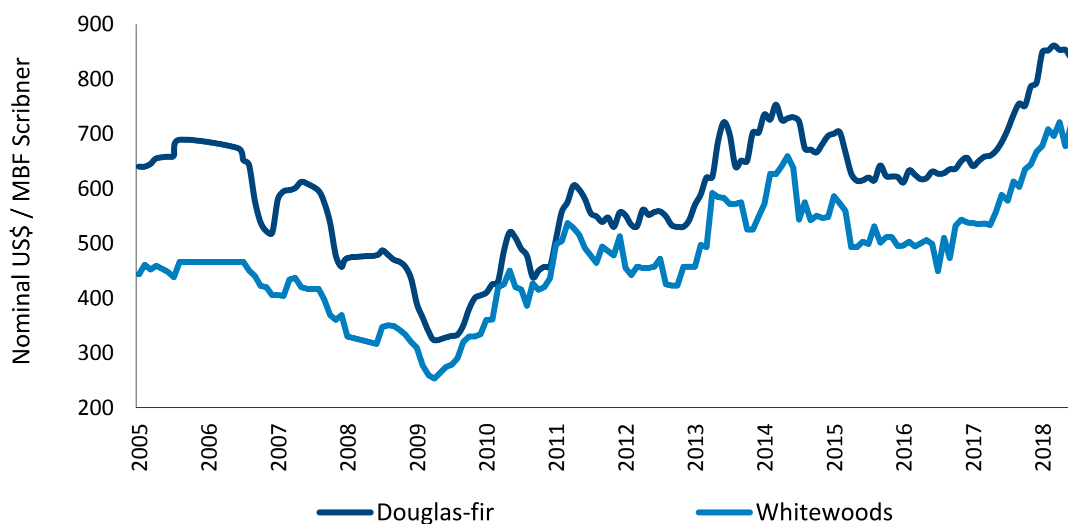
Figure 21: Southern Softwood Lumber Prices versus Southern Log Prices



Sources: TimberMart-South; Random Lengths

Unlike the US South, log prices in the Pacific Northwest have notably improved given a modestly improving US housing market, increased export log demand from Asia, and reduced timber supply both from Canada (e.g., the pine beetle infestation in British Columbia) and forest fires that have reduced the availability of commercial timber. The price of Douglas-fir #2 increased 15.0% year-over-year in July and is now 12.1% higher than its prior 2014 peak while the price of Whitewood #2 logs increased 9.0% year-over-year in July and is now 24.2% higher than its prior 2014 peak (Figure 22).

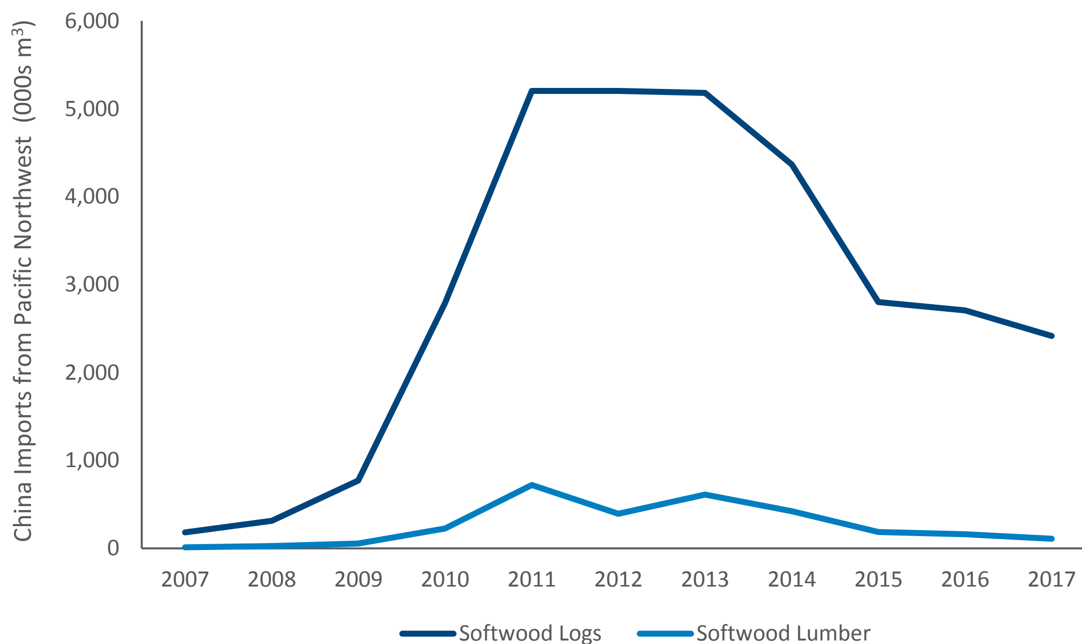
Figure 22: Columbia River #2 Douglas-fir and Mixed Whitewood Log Prices



Source: Log Lines

Since the end of the Great Recession, log and lumber demand in Asia, especially China, have significantly improved. In particular, Chinese log imports from the Pacific Northwest have increased as the government has imposed a ban prohibiting commercial timber harvests in its natural forests, which are designed to counter decades of over-cutting.[10] While Chinese import demand for US logs has softened in recent years, it remains well above historical levels (Figure 23). Log imports to Japan and South Korea have also increased.

Figure 23: Chinese Log and Lumber Imports from the US Pacific Northwest



Source: FEA-Canada / Wood Markets

As we have noted in prior research ("Canadian Lumber Producers in the US South", 2018), the amount of available timber from Canada, which has historically provided around 30-35% of all the lumber used in the US, is expected to decline by 10-15% as a result of a reduction in Canadian timber supply due to mortality associated with the Mountain Pine Beetle. Since the early 1990s, the Mountain Pine Beetle has attacked lodgepole pine in British Columbia and killed about 50% of that species in the province, impacting an area of over 43 million acres. Separately, in Eastern Canada, timber supply has declined as the government of Québec reduced the annual allowable cut by 20% in the mid-2000s to address historic overharvesting. Earlier in 2018, wood flows from Canada were further negatively impacted by transportation issues as extreme winter weather minimized rail shipments to the US.

Commercial timber supply has also declined due to forest fires. In 2017, both the US West Coast and British Columbia Interior experienced devastating forest fires impacting around 6.7 million acres and 3.0 million acres,

[10] Given the trade dispute with the US, Chinese log imports from the US will need to be monitored as China is expected to impose a 5% tariff on Douglas-fir logs and a 20% tariff on spruce logs, hemlock logs, and hardwood logs

respectively. Moreover, these fires resulted in diminished harvesting activity on acres in proximity to the fires, but not directly impacted by them. As a result, mills were unable to build sufficient log decks ahead of the winter and were motivated to pay higher prices to procure the wood they needed to operate their facilities.

Meanwhile, the composition of housing starts has changed with multi-family comprising a greater amount of total starts than it has historically, a trend that needs to be monitored given the lower amount of wood consumption per multi-family unit. Each 100,000 increase in housing starts, assuming a 70 / 30 mix of single-family / multi-family units, generates incremental demand of around 1.4 billion board feet of finished product (lumber and panels) or roughly 2.9 billion board feet of logs. If the mix of housing starts were to normalize back to an 80 / 20 mix of single-family / multi-family (the average from 1991-2006), this would result in incremental demand of around 1.6 billion board feet of finished product or roughly 3.1 billion board feet of logs, a 14% increase and 7% increase, respectively, versus the 70 / 30 mix scenario.

In addition, there are some relatively recent trends in housing that need to be monitored as they have a direct impact on wood consumed. Since the mid-2000s, engineered wood products such as I-joists have been gaining market share against traditional wood products such as lumber. I-joists have been replacing 2x10s and 2x12s as floor joists as they are structurally stronger, utilize less wood, and are more cost effective. Similarly, home designs have shifted to open floor plans from what had been defined rooms. This has resulted in less walls and doors and therefore less wood usage. In contrast, cross-laminated timber (several layers of kiln-dried lumber boards stacked crosswise at 90-degree angles, glued into place, and pressed to form a solid, straight, rectangular panel) has recently started to be used in multi-family construction given its strength, dimensional stability, and rigidity. Cross-laminated timber can replace steel, concrete, and masonry in mid-rise buildings. While this product has gained some traction in construction in Europe, it is still in its infancy in the US.

Conclusion

The US housing market is one of the largest drivers of domestic wood products and timber markets, accounting for 30% of demand for US softwood lumber and 42% of demand for US panels. During the Great Recession, the housing market precipitously declined leading to lower demand for both products. While the housing market has improved, it is now growing at a more moderate pace than in the years immediately following the Great Recession. Factors including labor, lot, and credit availability, land entitlement, wage growth, student debt, and affordability have prevented the industry from reaching its full potential. Post-crisis, a few key trends have emerged. Despite concerns to the contrary, Millennials have become the largest generational group of home buyers over the last five years. Importantly, given that Millennials comprise more than 80 million individuals, this trend has the potential to contribute to future housing demand as this generation continues to age and increase its rate of home ownership. In addition, the US has experienced a notable increase in the age of its housing stock, a trend that has accelerated due to a lack of new construction. As such, a portion of existing homes requires either refurbishment or a complete rebuild, a positive for wood products and timber demand. Lastly, the mix of housing starts has changed with multi-family comprising a greater amount of total starts than it has historically, a trend that needs to be followed as a multi-family unit utilizes less wood than a single-family structure. In aggregate, these dynamics warrant close monitoring as timberland investors seek to position themselves to benefit from continued changes in US forest product markets.

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