

BofA US Home Sales Indicators

Introducing the BofA US New Home and Existing Home Sales Indicators

Industry Overview

Launching BofA US New & Existing Home Sales Indicators

We launch the BofA US New and Existing Home Sales Indicators, a monthly proprietary tool intended to help identify inflection points and trends in the US housing market.

These indicators will be included in the [BofA Global Proprietary Signals](#).

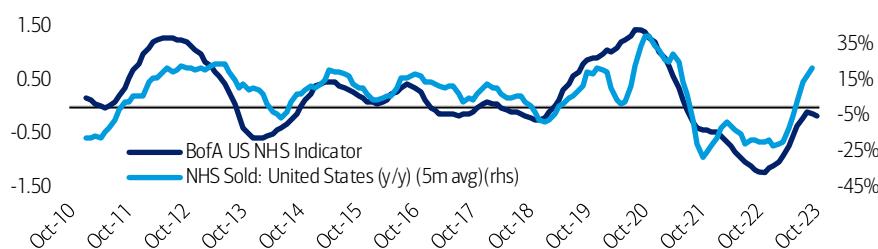
- The **BofA US New Home Sales Indicator** (NHS indicator) is intended to lead new home sales (NHS) as reported by the US Census Bureau by three months and has a positive correlation of 0.80 from 2013 (0.65 from 1979). Importantly, trailing 3-month NHS has a 0.62 correlation with homebuilder stocks since 1996 (Exhibit 5).
- The **BofA US Existing Home Sales Indicator** (EHS indicator) is intended to lead existing home sales (EHS) as reported by the National Association of Realtors by five months and has a positive correlation of 0.87 from 2013 (0.69 from 1979). Home turnover can be a revenue driver for the home improvement, furniture, real estate brokerage, mortgage origination/insurance, and self-storage industries.

NHS Indicator slowing, but lower rates could be tailwind

New home sales recovered sharply through 2023. The strong job market, favorable demographics (growing number of households), and low existing home supply remain tailwinds to the new home market in our view. Our NHS Indicator suggests growth in new home sales could slow over the next few months due to the spike in mortgage rates in October. However, the recent pullback in rates and potential for Fed pivot to rate cuts ([The straw that broke the hiking cycle's back](#)) could drive additional recovery into 2024.

Exhibit 2: BofA US New Home Sales Indicator vs. new family houses sold year over year

The indicator leads new home sales by three months with a positive correlation (0.80) since 2013



Source: BofA Global Research, US Census Bureau. **Note:** The BofA US New Home Sales Indicator identified above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

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Hold your houses: lack of inventory stifling home turnover

Existing home sales are tracking at the lowest level since 2010. Our EHS indicator suggests existing home sales troughed but will remain muted into 2024. Existing home inventory is historically low with 80% of current homeowners currently locked in <5% mortgage rates ([Housing Watch: Turbulence but no crash](#)).

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Refer to important disclosures on page 17 to 19.

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Exhibit 1: Trends of key inputs

Directional trends of indicators' inputs

BofA US New Home Sales Indicator	
Input	Trend
Financing and affordability	▼
Demographics	▲
Homebuyer confidence	▼
Homebuilder confidence	▼
Housing supply	▲
Real-Time Trends	▼
BofA US Existing Home Sales Indicator	
Input	Trend
Financing and affordability	▼
Demographics	▲
Homebuyer confidence	▼
Housing supply	▼
Real-Time Trends	▼

Source: BofA Global Research

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BofA US New Home Sales Indicator

Key Drivers of the BofA New Home Sales Indicator

We collaborated with our Predictive Analytics team to identify eight variables that have high correlation, in aggregate, to the five month smoothened US new home sales (NHS) as reported by the US Census Bureau. Importantly, we selected inputs that lead new homes sales after filtering through roughly 200 data series that correlated with new homes sales but were coincidental or lagging. We believe our Indicator captures the key underlying drivers of new home sales including: 1) affordability and cost of financing, 2) demographics, 3) homebuyer confidence, 4) homebuilder confidence and 5) housing supply. We also incorporate the mortgage application index data to reflect real-time trends.

Exhibit 3: Key inputs of BofA US New Home Sales Indicator

6 out of 8 of the variables are tracking neutral or negative

Component	Data	Last Updated	Y/Y Direction	Sequential Direction	Discretionary Direction Classification	Direction Explanation
1) Financing and affordability						
Freddie Mac 30-year mortgage rate	7.44%	Weekly as of November 16th, 2023	↑	↓	■	Mortgage rates are up YoY, but have declined recently as Fed announced potential pauses in rate hikes
% Consumer Confidence Respondents Who Say Mortgage Rates Will: Go Up	47.0%	Monthly as of October 2023	↓	↑	■	Home buyer confidence has declined
Affordability: P&I by Median Household Income*	0.97	Monthly as of October 2023	↓	↓	▼	Affordability remains historically low
2) Demographics						
Number of US Households (thousands)	130,386	Monthly as of October 2023**		↓	▲	Household estimates are still higher than historical average
3) Homebuyer confidence						
% Respondents Who Say it is a Good Time to Buy	15%	Monthly as of October 2023	↓	↓	▼	Most respondents believe it is a bad time to buy
4) Homebuilder confidence						
Homebuilder Confidence Survey: Single-Family Sales over next six-months	39	Monthly as of November 2023	↑	↓	▼	Homebuilder confidence has declined recently with higher rates
5) Housing Supply						
Homeowner Vacancy Rate	0.80	Quarterly as of October 2023**	=	=	▲	Historically low vacancy rates
6) Real-time trends						
Mortgage Banker's Association Mortgage Application Index	170	Weekly as of November 17th, 2023	↓	↓	▼	High mortgage rates have pressured demand

Source: BofA Global Research, Bloomberg, Freddie Mac, Fannie Mae, US Census Bureau, Mortgage Bankers Association, US Bureau of Economic Analysis

* Median P&I / Median Household income assumes New Home Median Price based on the 30yr FRM with 80% LTV. The monthly P&I is then divided by Median Household Income.

**October number of US households and homeowner vacancy rate is the rolling average of the past three months.

▲ = Favorable; ■ = Neutral; ▼ = Unfavorable

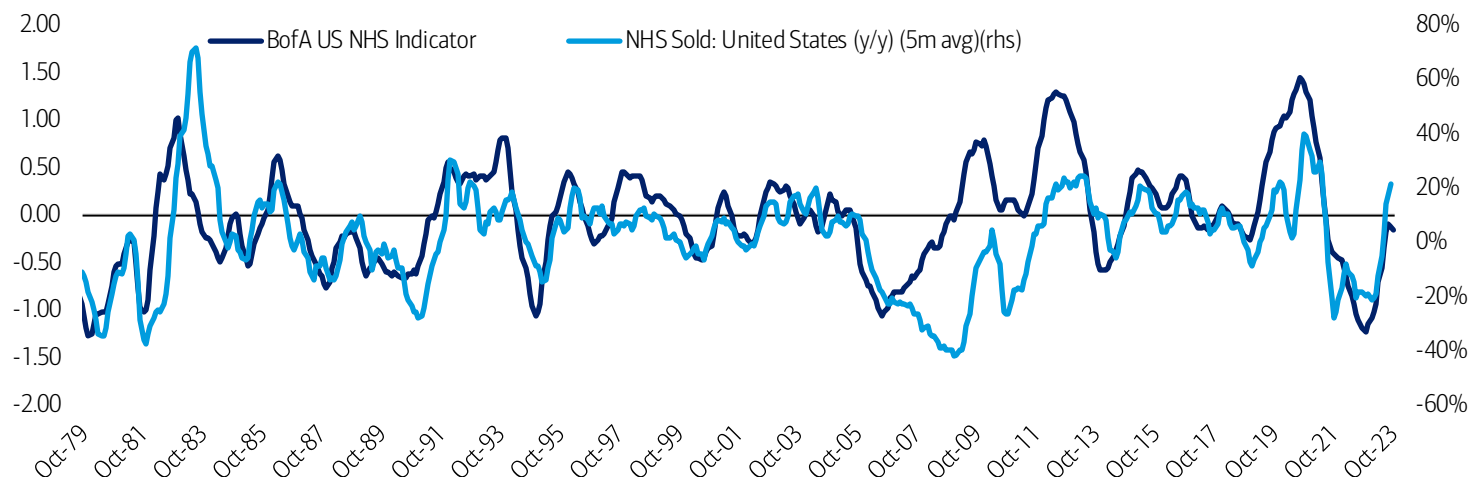
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NHS Indicator intended to lead new home sales by 3 months

The BofA US New Home Sales Indicator leads new home sales (NHS) by three months with a positive correlation of 0.80 from 2013 (0.65 from 1979) according to our historical backtested correlation analysis. We found that the indicator can be helpful to anticipate potential inflection points in the US housing market historically. Recent examples include: 1) the Indicator inflected positively in November 2022 ahead of the trough in new home sales YoY declines in early 2023, 2) the Indicator turned negative in mid-2021 ahead of meaningful YoY declines in new home sales through late 2021 and into 2022, and 3) the Indicator inflected positively in April 2019 ahead of a recovery in new home sales in 2H19. NHS data is a volatile series, but our NHS indicator has been constructed in such a way as to attempt to avoid short-term fluctuations and provide underlying trends with a lead.

Exhibit 4: US New Home Sales Indicator vs. new family homes sold year over year since 1979

The indicator leads new home sales by three months with a positive correlation (0.65) from 1979



Source: BofA Global Research. **Note:** The BofA US New Housing Indicator identified above is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark

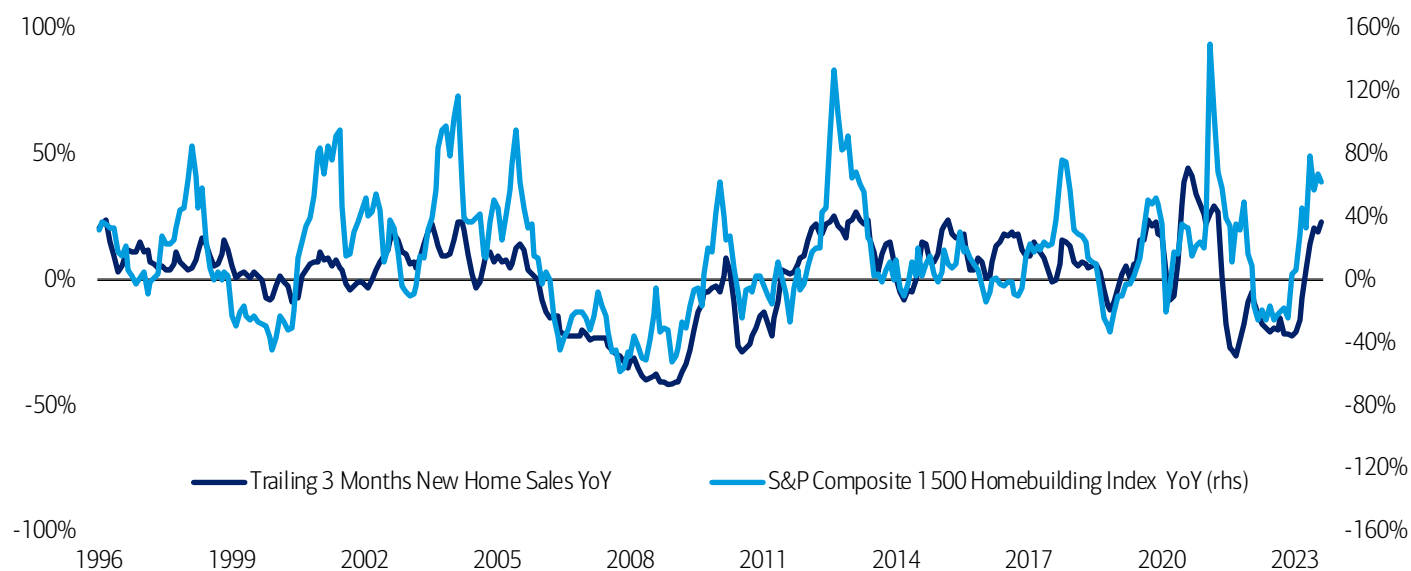
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Homebuilder stocks are correlated with new home sales

Importantly, new home sales growth has a 0.59 correlation with the YoY change in S&P 1500 Homebuilding Index since 1996 and trailing 3-month new home sales growth has a 0.62 correlation with S&P 1500 Homebuilding Index. Stronger outlook for new home sales typically reflects better orders and margins for homebuilders. We estimate public homebuilders hold roughly 40% market share of new home sales and continue to gain share.

Exhibit 5: Trailing 3 month new homes sales YoY vs. S&P Composite 1500 Homebuilding Index YoY

The trailing 3 month new home sales YoY change and the S15HOME Index have a positive correlation (0.62) from 1996



Source: BofA Global Research, Bloomberg, Haver Analytics
Data through September 2023

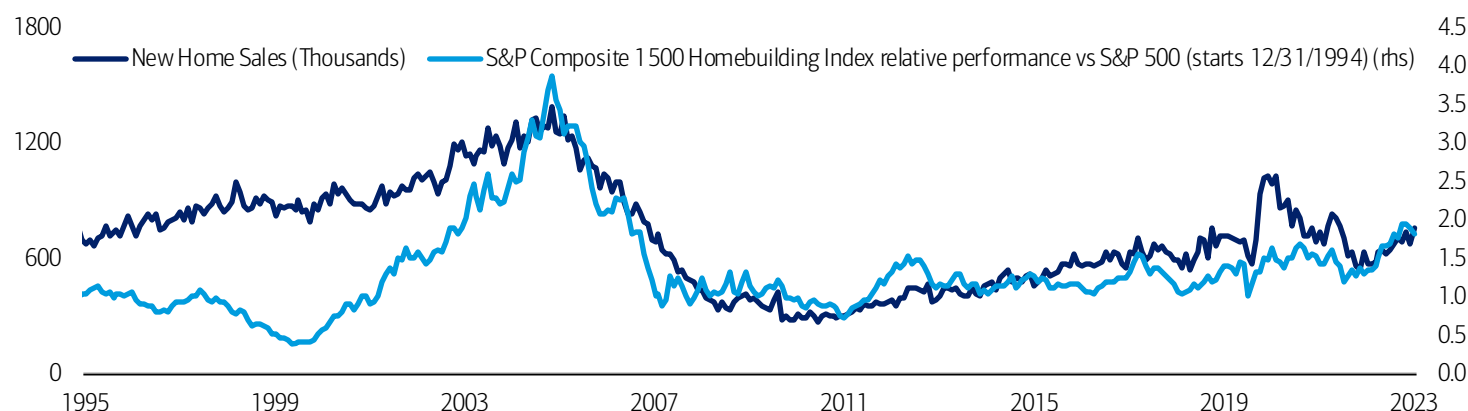
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Homebuilder relative stock performance even more correlated to NHS

New home sales as measured by US Census Bureau to the relative performance of the S&P 1500 Homebuilding Index (S15HOME Index) has a 0.87 correlation since 2005.

Exhibit 6: New Home Sales vs the relative performance of the S&P 1500 Homebuilding Index

New Home Sales has been closely following the relative performance of the S15HOME Index with a 0.87 correlation since 2005



Source: BofA Global Research, Bloomberg, US Census Bureau
Data through September 2023

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Potential stock implications for stronger new home sales

When the BofA US New Home Sales Indicator is rising, we see positive implications across multiple sectors from stronger new home demand and increased pace of new construction. In homebuilders and building products, we expect homebuilders and new construction leveraged building product distributors and manufacturers to outperform. In forest products/materials, lumber, panel, siding and distribution companies should benefit from an increase in housing starts. In consumer finance, mortgage insurers would likely benefit from higher origination of mortgages for new home sales.

Exhibit 7: When the New Home Sales Indicator is rising...

BofA fundamental analysts see positive potential implications for these sub-sectors

Sector (Region)	Analyst	Sub-sector stock (Ticker)
Homebuilders (US)	Rafe Jadrosich	Homebuilders, new construction building products, distributors TopBuild (BLD US)
Paper, Packaging & Forest Products (US)	George Staphos	Lumber, panels, siding, distribution Weyerhaeuser (WY US), PotlatchDeltic (PCH US), Louisiana-Pacific (LPX US), Boise Cascade (BCC US)
Consumer Finance (US)	Mihir Bhatia	Mortgage Insurers
Australia Building Materials (AU)	Shaurya Visen	Building Products James Hardie (JHX AU)

Source: BofA Global Research

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September US new home sales at 759k vs. 656k long-term average

Reported by the US Census Bureau, US new home sales measures the sales of new single-family homes with seasonally adjusted rates. Since 1963, new home sales SAAR in the US have averaged at a rate of 656K. US home sales peaked in 2005 at 1.389mm homes sold during the housing bubble partially due to a drop in credit requirements that led to high mortgage demand. Post housing crash and the Global Financial Crisis, new home sales troughed at a rate of 270K in 2011. At present, we see a housing backdrop similar to the early 1980s, when interest rates spiked due to elevated inflation, and the 30-year fixed mortgage rate reached a peak of 18.4% in 1981. New home sales rebounded sharply and recovered to pre-mortgage rate spike levels by 1983.

Exhibit 8: Rate of new home sales since 1963

2022 and 2023 new home sale trends are similar to the early 1980s trends due to high inflation and high interest rates



Source: BofA Global Research, US Census Bureau
Data through October 2023

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New home sales benefitting from lack of existing home inventory

Existing home inventory has been declining since August 2021 due to rising mortgage rates and lock-in effect. New homes are now tracking near a record high percentage of the total inventory of homes available.

Exhibit 9: New home inventory as a % of total inventory

New home inventory was 30% of total inventory in September 2023



Source: BofA Global Research, Census Bureau, National Association of Realtors, Haver Analytics
Data through September 2023

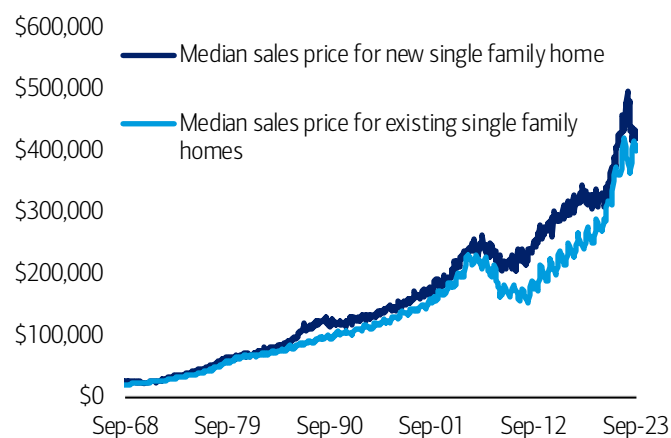
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Spread between new and existing home prices has narrowed

In February 2012, the premium on new home sales peaked at 34.9% versus the median existing home sales price, as builders slowed the pace of new construction and existing home prices fell. Since then, the spread has narrowed between new and existing median home prices, with new home prices at just 4.7% premium in September 2023, near the lowest levels over the last 40 years.

Exhibit 10: Median sales prices of new homes vs existing homes

The median sales price of new homes decreased (12%), YoY, while existing family homes increased 2% YoY

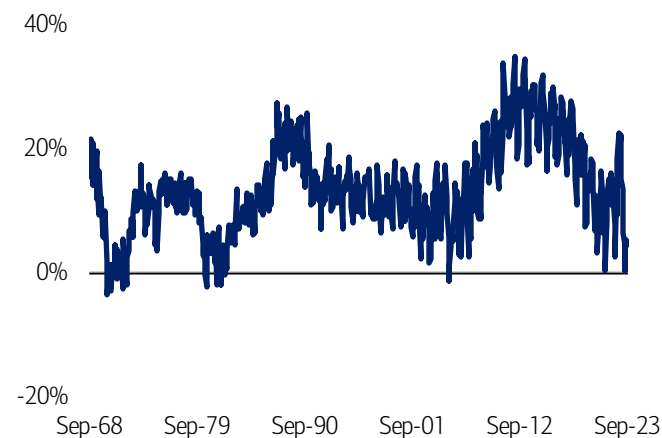


Source: BofA Global Research, Census Bureau
Data through September 2023

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Exhibit 11: Price premium of new homes vs existing homes

The new home median price is 4.7% higher than existing homes price in September



Source: BofA Global Research, Census Bureau
Data through September 2023

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Homebuilders are building smaller homes to improve affordability

In 2Q 2023, the median floor area in new homes was reported by US Census Bureau as 2191 square feet, a (4.7%) decrease since 2Q 2022, and a (13%) decrease since the peak in 1Q 2015.

Exhibit 12: New home median Floor Area (NSA, Square feet)

Median floor area has decreased (4.7%) YoY in 2Q 2023



Source: BofA Global Research, Census Bureau, Haver Analytics
Data through 2Q 2023

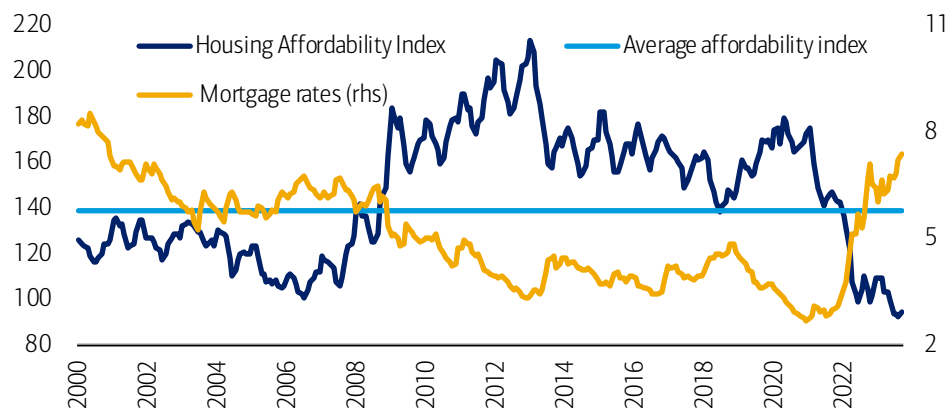
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Housing Affordability is near historical lows

The Housing Affordability Index was reported by National Association of Realtors (NAR) at 94.1 in September, tracking at 32% below the historical average 138.8. A contributing factor has been the rising mortgage rates in the past year, which have affected whether a typical family earns enough income for a mortgage loan that is now around 7.50%.

Exhibit 13: Housing Affordability Index vs mortgage rates

The housing affordability index decreased (9.7%) YoY



Source: BofA Global Research, Haver Analytics, FHLMC Note: Contract interest rates on commitments for 30-year fixed-rate first mortgages. Prime mortgages only

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BofA US Existing Home Sales Indicator

Key drivers of the BofA Existing Home Sales Indicator

We collaborated with our Predictive Analytics team to identify nine variables that have high correlation, in aggregate, to US existing home sales (EHS) as reported by the National Association of Realtors (NAR). Importantly, we selected inputs that lead existing homes sales after filtering through roughly 200 data series that correlated with existing homes sales but were coincidental or lagging. We believe our Indicator captures the key underlying drivers of existing home sales including: 1) affordability and cost of financing, 2) demographics, 3) homebuyer confidence, and 4) housing supply. We also incorporate index data on mortgage applications and pending home sales to reflect real-time trends.

Exhibit 14: Key inputs of BofA US Existing Home Sales Indicator

8 out of 9 of the variables are tracking neutral or negative

Component	Data	Last Updated	Y/Y Direction	Sequential Direction	Discretionary Direction Classification	Direction Explanation
1) Financing and affordability						
Freddie Mac 30-year mortgage rate	7.44%	Weekly as of November 16th, 2023	↑	↓	Yellow square	Mortgage rates are up YoY, but have declined recently as Fed announced potential pauses in rate hikes
% Consumer Confidence						
Respondents Who Say Mortgage Rates Will: Go Up	47%	Monthly as of October 2023	↓	↑	Yellow square	Home buyer confidence has declined
Median mortgage payment / Real personal disposable Income*	0.97	Monthly as of October 2023	↓	↓	Red downward triangle	Affordability remains historically low
2) Demographics						
Number of US Households (thousands)	130,386	Monthly as of October 2023**		↓	Green upward triangle	Household estimates are still higher than historical average
3) Homebuyer confidence						
% Respondents Who Say it is a Good Time to Buy	15%	Monthly as of October 2023	↓	↓	Red downward triangle	Most respondents believe it is a bad time to buy
4) Housing Supply						
Homeowner Vacancy Rate	0.80	Quarterly as of October 2023**	=	=	Yellow square	Historically low vacancy rates
US Existing Homes Inventory (millions)	40.54	Monthly as of October 2023	↓		Red downward triangle	Inventory is still low compared to historical average of 2.2
5) Real-time trends						
Mortgage Banker's Association Mortgage Application Index	170	Weekly as of November 17th, 2023	↓	↓	Red downward triangle	High mortgage rates have pressured demand
Pending Home Sales Index (PHSI)	139.89	Monthly as of October 2023	↓		Red downward triangle	Pending sales continue to decline YoY

Source: BofA Global Research, Bloomberg, Freddie Mac, Fannie Mae, US Census Bureau, Mortgage Bankers Association, US Bureau of Economic Analysis
Data through October 2023; Existing Homes Inventory and Pending Home Sales Index through September 2023

* Median P&I / Median Household income assumes New Home Median Price based on the 30yr FRM with 80% LTV. The monthly P&I is then divided by Median Household Income.

Exhibit 14: Key inputs of BofA US Existing Home Sales Indicator

8 out of 9 of the variables are tracking neutral or negative

Component	Data	Last Updated	Y/Y Direction	Sequential Direction	Discretionary Direction Classification	Direction Explanation
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**October number of US households and homeowner vacancy rate is the rolling average of the past three months.

▲ = Favorable; ■ = Neutral; ▼ = Unfavorable

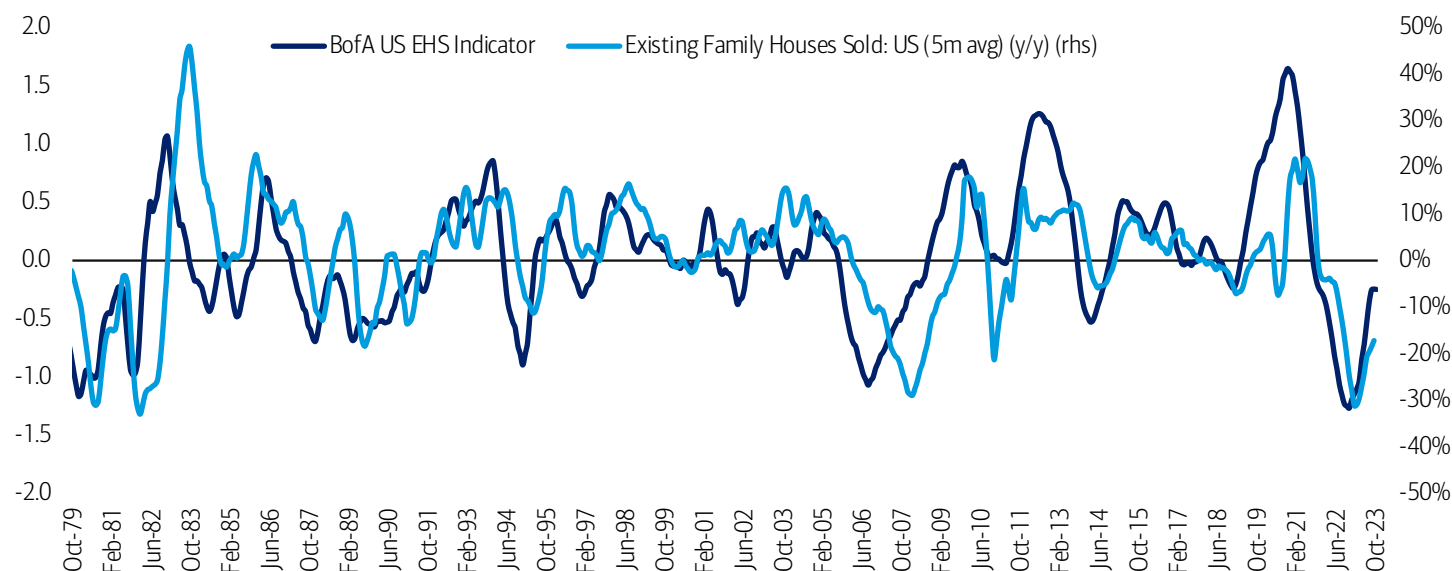
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EHS Indicator leads existing home sales by five months

The BofA Existing Home Sales Indicator leads five month smoothed existing home sales (EHS) by five months with a positive correlation of 0.87 from 2013 (0.69 from 1979) according to our historical backtested correlation analysis. We found that the indicator was positively correlated with potential inflection points in the US housing market historically. Based on our analysis, recent examples include: 1) the Indicator inflected positively in October 2022 ahead of the trough in existing home sales YoY declines in February 2023, 2) the Indicator turned negative in August 2021 ahead of negative YoY declines in existing home sales that began in November 2021, and 3) the Indicator inflected positively in January 2019 and reached its peak in September 2020, ahead of a double digit YoY growth in existing home sales in 2H20 and 1H21. EHS data is a volatile series, but our EHS indicator has been constructed in such a way as to attempt to avoid short-term fluctuations and provide underlying trends with a lead.

Exhibit 15: BofA US Existing Home Sales Indicator vs. existing family houses sold year over year

The EHS indicator leads existing home sales by five months with a positive correlation (0.69 since 1979)



Source: BofA Global Research, National Association of Realtors. **Note:** The BofA US Existing Housing Indicator identified in this report is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark.

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Potential stock implications for stronger existing home sales

When the BofA US Existing Home Sales Indicator is rising, we see positive potential implications across multiple sectors to stronger existing home sales. In building products, we expect repair and remodel focused building products companies to benefit from turnover driven renovation projects. In Hardline/Retail, home improvement retailers, mattresses, and home furnishings could all benefit from homeowners making large purchases around housing turnover. In Internet, online real estate would benefit from increased housing transactions. In consumer finance, mortgage insurers and mortgage originators would benefit from an increase mortgage activity. In real estate, self storage companies would benefit from an increase in homeowners moving homes.

Exhibit 16: When the Existing Home Sales Indicator is rising...

BofA fundamental analysts see positive potential implications in these sub-sectors

Sector (Region)	Analyst	Sub-sector
Building Products (US)	Rafe Jadosich	Building Products Mohawk (MHK US), Masco (MAS US)
Hardline Retail (US)	Elizabeth Suzuki	Home improvement retailers
Hardline Retail (US)	Jason Haas	Mattresses, home furnishings
Paper, Packaging & Forest Products (US)	George Staphos	Lumber, panels, siding, distribution Weyerhaeuser (WY US), PotlatchDeltic (PCH US), Louisiana-Pacific (LPX US), Boise Cascade (BCC US)
Internet (US)	Curtis Nagle	Online Real Estate Zillow Group (ZG US), Redfin (RDFN US), Opendoor Technologies (OPEN US)
Consumer Finance (US)	Mihir Bhatia	Mortgage insurers & Mortgage originators
REITs (US)	Jeff Spector	Storage Public Storage (PSA)
Australia Building Materials (AU)	Shaurya Visen	Building Products James Hardie (JHX AU), Reliance (RWC)

Source: BofA Global Research

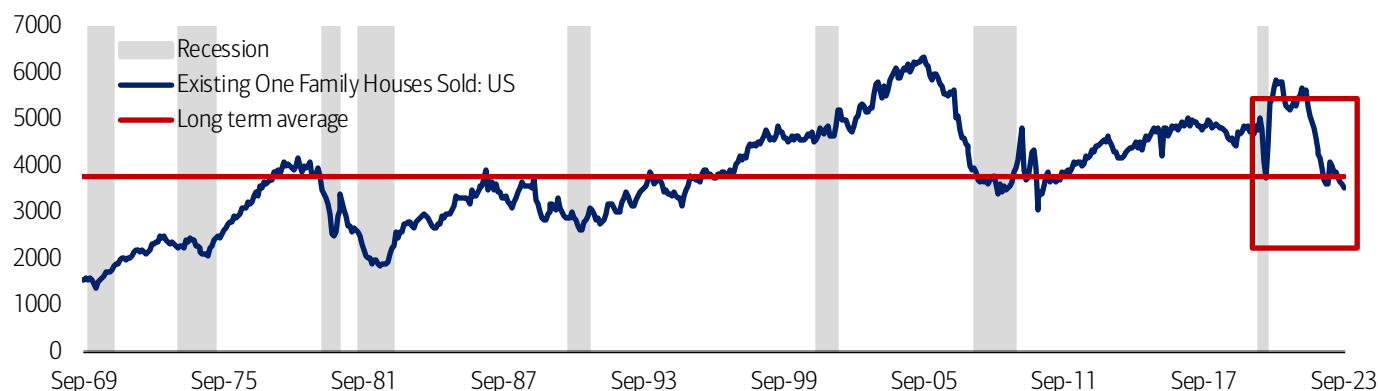
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September US existing home sales at 3.5mm vs. 3.7mm long-term average

Reported by the National Association of Realtors, existing home sales data measures the sales and prices of existing single-family homes for the United States overall at a seasonally adjusted annual rate (SAAR). Existing home sales SAAR in the United States averaged 3,731mm from 1968 until 2023, reaching an all time high of 6,340mm in September 2005 and a record low of 1,370mm in March 1970. Like new home sales, we see a similar backdrop as the early 1980s when mortgage rates spiked following a period of high inflation and significant home price appreciation. Due to the lock-in effect of mortgage rates, existing home supply remains depressed.

Exhibit 17: Rate of existing home sales since 1968

2023 and 2023 existing home sales are experiencing a similar decline to the 1980s existing home trends



Source: BofA Global Research, National Association of Realtors
Data through September 2023

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Hold your houses: lack of inventory stifling home turnover

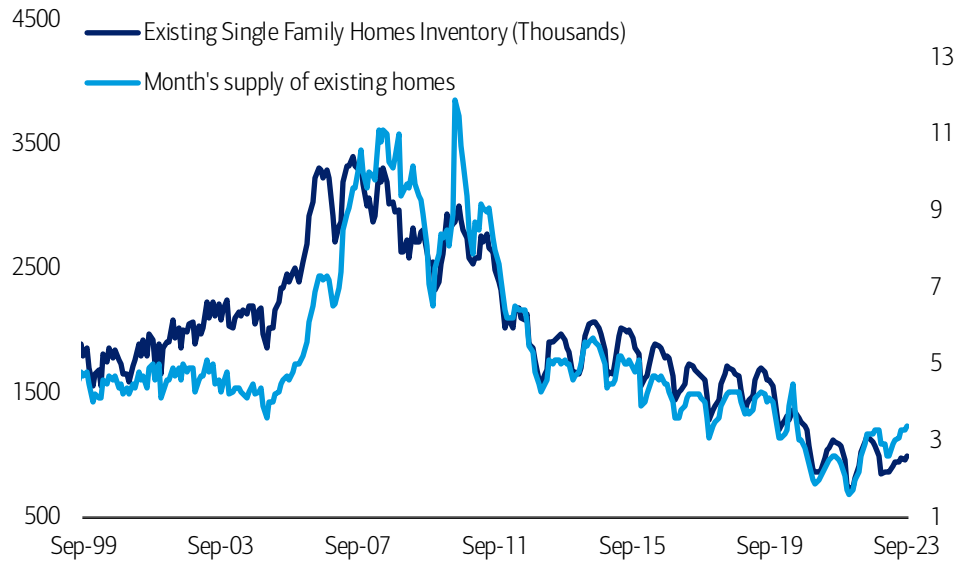
Existing home sales are tracking at the lowest level since 2010 and our EHS indicator suggests turnover is likely to remain under pressure into early 2024. Existing home inventory is historically low with 80% of current home owners currently locked in <5% mortgage rates ([Housing Watch: Turbulence but no crash](#)). The housing market experienced similar dynamics in the early 1980s (mortgage rates ~18% in 1981), new home sales recovered to pre-mortgage rate spike levels by 1983 while existing home sales did not recover until 1985.

Existing home inventory remains historically low

Existing home inventory is at 1.0mm vs. 2.1mm historical average since 1982. Months of supply is at 3.4 months, vs. a 5.3 month historical average since 1999.

Exhibit 18: Existing home inventory

Existing home inventory has declined to historic lows



Source: BofA Global Research, National Association of Realtors
Data through September 2023

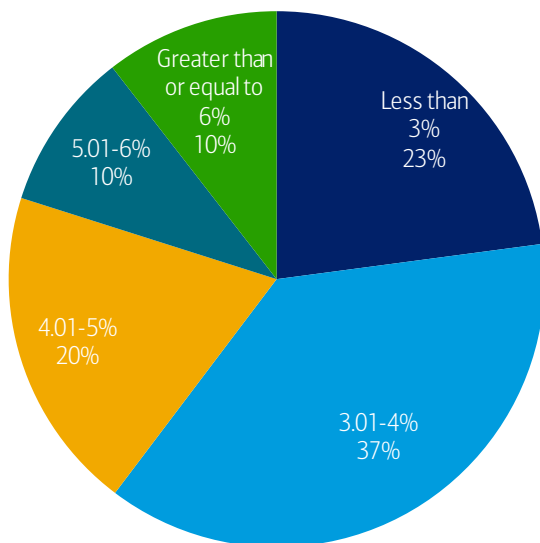
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Homeowners are locked in at low rates

One big contributing factor of the low existing home inventory is the “lock-in effect” of low mortgage rates. According to National Mortgage Database (NMDb), 80% of homeowners have a fixed-rate mortgage below 5% compared to current rate at 7.44%. Effective mortgage rate was reported as 3.7% in 3Q 2023 and remains much lower than the current reported mortgage rate.

Exhibit 19: Ranges of mortgage rates

80% of homeowners had a below 5% mortgage rate in September

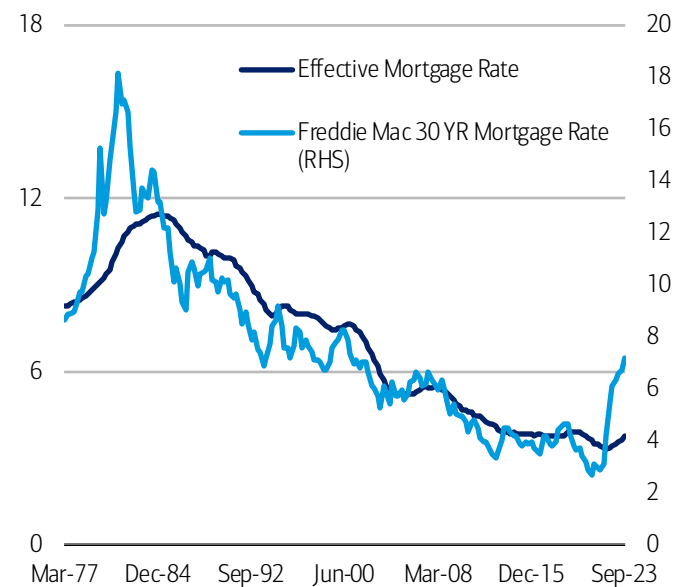


Source: BofA Global Research, NMDb

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Exhibit 20: Effective mortgage rate vs current mortgage rate

In September, there was a 3.46% spread between effective mortgage rate and Freddie Mac 30 YR mortgage rate



Source: BofA Global Research, Freddie Mac, Haver Analytics
Data through September 2023

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Less moving, less spending

As housing turnover stalls, where does spending fall?

US existing home sales in September '23 reached the lowest seasonally-adjusted annualized rate (SAAR) in thirteen years due primarily to low housing supply and challenging affordability. To assess the sectors and product categories most directly impacted by low housing turnover, we utilize BAC aggregated credit and debit card data and analyze spending patterns for households that have experienced a move. See the [BofA on USA note published 09 November 2023](#) for an explanation of the methodology, disclaimers and limitations with BAC aggregated credit and debit card data. See link to full report: [Move it! Analyzing the impact of housing turnover on consumer spending](#).

Big-ticket home products are sensitive to turnover

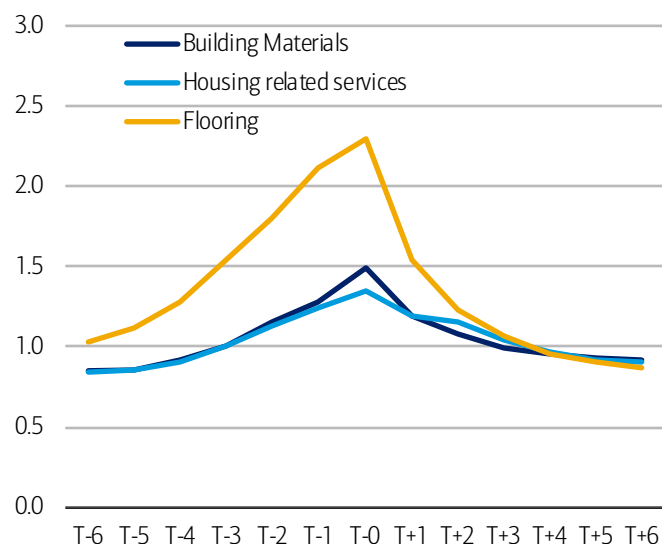
Among housing-related goods and services, we observed the biggest relative delta in spending between movers and non-movers in big-ticket home products, specifically mattresses, furniture, and flooring according to the BAC aggregated card data. Households that had changed zip codes spent almost 6x as much on mattresses as those that did not move in our observation period (Exhibit 22). Spending on furniture by movers was 3.5x that of non-movers (Exhibit 22) and spending on flooring was about 2.3x that of non-movers (Exhibit 21). This data supports what we suspected about the relative sensitivity of big-ticket home goods to housing turnover vs. the broader home maintenance category.

Furnishings more impacted than home improvement

While spending on building materials and professional housing-related services (contractors, electricians, roofers, etc.) was also higher for movers than non-movers according to the BAC aggregated card data, the degree of variance was not as material as in the big-ticket product categories. At peak, households who had changed zip codes spent about 1.5x as much on building materials and about 1.4x as much on housing-related services as non-movers. Notably the BAC aggregated card data also showed that movers spent *less* on these categories than non-movers both leading up to their move (T-6 to T-4) and a few months after the move (T+4 to T+6).

Exhibit 21: Within home improvement categories, flooring is materially impacted by housing turnover, with movers spending 2.3x as much as non-movers

Home improvement spending comparison by month for households that moved in month T-0 vs. households that did not move

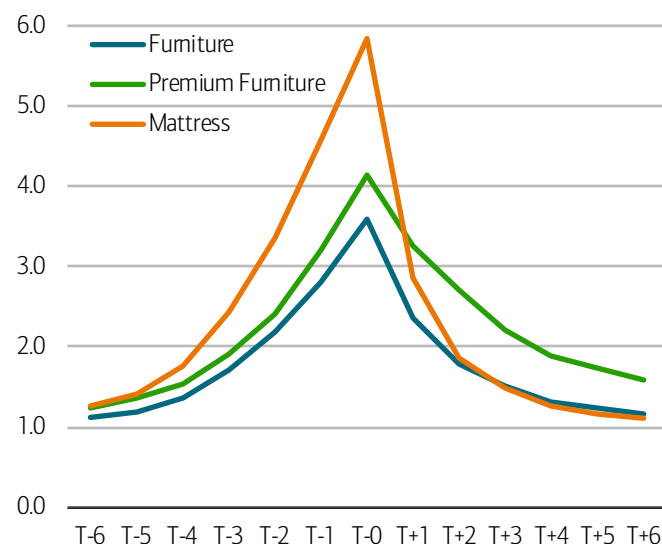


Source: BAC internal data

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Exhibit 22: Movers spent 3.5x as much on furniture, over 4x as much on premium furniture, and almost 6x as much on mattresses as non-movers

Furniture & mattress spending comparison by month for households that moved in month T-0 vs. households that did not move



Source: BAC internal data

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Methodology for comparing movers vs. non-movers

We define a change of address (“move”) when there is an observed change in home address zip code from month T-1 to T-0, with month T-0 being the month in which the address zip code changed. We analyzed the moves observed each month in 2019-2023, and compared the spending behavior between those who moved and those who did not move. Ratios in the charts below represent the average spend of households that have experienced a move at month T-0 indexed to the average spend of households that have not moved over the 13 month period from T-6 to T+6.

Methodology, Risks and Disclaimers

Components of the Indicators (New Home Sales)

We worked with our Predictive Analytics team to analyze over 200 data series to build a proprietary indicator for the New Home Sales as reported by US Census Bureau.

We tested each variable with different lag periods to determine the best fit and identified eight variables that are not only intuitive drivers of house building activity, but also have good correlation with the S&P S15HOME Index. We then selected metrics that met key criteria including consistency, promptness of reporting (relative to month end), and economic significance. We focused on data that is available monthly with a reasonable length of history (five variables since 1976 and rest with more than 10 years of history). The indicator in its full form with all eight variables begins in December 2010. We believe this indicator helps deepen the understanding of New Home Sales with U.S. macro factors.

Exhibit 23: Components of the BofA New Home Sales and Existing Home Sales Indicators

The New Home Sales and Existing Home Sales Indicators are comprised of eight and nine components, respectively

Component	Source	Measure of	Indicator
1) Financing and affordability			
Freddie Mac Enhanced PMMS US 30 Year FMR	Freddie Mac, Bloomberg	30-year-fixed-rate mortgage	Both
Respondents Who Say Mortgage Rates Will: Go Up	Fannie Mae, Bloomberg	Home purchase sentiment	Both
Affordability: P&I by Median Household Income	US Bureau of Economic Analysis	Income and US affordability	Both
2) Demographics			
Household Estimates	US Census Bureau	Number of US Households (thousands)	Both
3) Homebuyer confidence			
Net Percent of Respondents Who Say it is a Good Time to Buy (%Bal)	Fannie Mae	Housing market sentiment	Both
4) Homebuilder confidence			
Homebuilder Confidence Survey: Single-Family Sales over next six-months	US Census Bureau	Future single family housing sales	New Home Sales Indicator
5) Housing Supply			
Homeowner Vacancy Rate	US Census Bureau	US Housing market	Both
US Existing Homes Inventory	NAR, Redfin.com	Existing home sales activity	Existing Home Sales Indicator
6) Real-time trends			
MBA US FRM Index NSA	Mortgage Bankers Association, Bloomberg	US single-family loan application activity	Both
Pending Home Sales Index (PHSI)	NAR, Redfin.com	Pending home sales activity	Existing Home Sales Indicator

Source: BofA Global Research

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Weighting of variables (New Home Sales)

The BofA New Home Sales Indicator is constructed by taking an equal-weighted average of the smoothened z-scores of the eight input variables. Our historical backtested correlation analysis indicates that these eight variables in aggregate have a strong

correlation with New Home Sales growth, and we believe the New Home Sales can be an effective proxy to gauge New Home Builders Index. As a best practice, we believe the indicator should be viewed in context of several months, and general directionality, rather than focusing solely on monthly readings that can fluctuate.

Components of the Indicators (Existing Home Sales)

We worked with our Predictive Analytics team to analyze over 200 data series to create a proprietary indicator for the Existing Home Sales as reported by US Census Bureau.

We tested each variable with different lag periods to determine the best fit and identified nine variables that are not only intuitive drivers of Existing Home Sales activity, but also have good correlation with their S&P S15BUILX Index. We then selected metrics that met key criteria including consistency, promptness of reporting (relative to month end) and economic significance. We focused on data that is available on a monthly basis with a reasonable length of history (five variables since 1976 and rest with more than 10 years of history). The indicator in its full form with all eight variables begins in December 2010. We believe this indicator helps deepen the understanding of Existing Home Sales relationship with U.S. macro factors.

Weighting of variables (Existing Home Sales)

The BofA Existing Home Sales Indicator is constructed by taking an equal-weighted average of the smoothened z-scores of the eight input variables. Our historical correlation analysis indicates that these nine variables in aggregate have a strong correlation with Existing Home Sales growth, and we believe the Existing Home Sales can be an effective proxy to gauge Building Materials Index. As a best practice, we believe the indicator should be viewed in context of several months, and general directionality, rather than focusing solely on monthly readings that can fluctuate.

Disclaimers, Risks and Limitations

The composition of our indicator will be subject to review every 6 - 12 months. We will monitor the continued relevance, availability, and timing of each variable and evaluate the inclusion of additional data series. We reserve the right to modify the setup of the, but do not intend to make frequent changes. However, any future modifications will be made to increase the statistical performance of our indicator. When the inputs have been released with a delay, we have used the last available data point for our calculation. Historical correlation may not result in future correlation.

Another risk can be attributed to divergence of the target variable from underlying components of the indicator. For example, during the period of Oct-92 to Mar-93 the NHS slowed from 22% to 3% even though the mortgage rates and affordability improved considerably and our indicator remained flat as Household Estimates deteriorated.

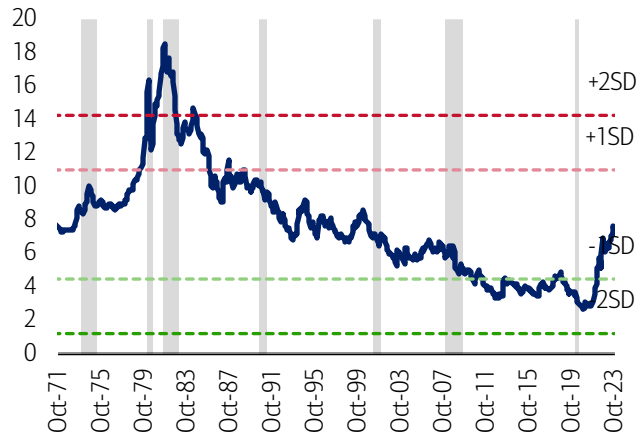
Equal weighting of variables could overlook potential disproportionate impact on demand from certain variables. Changes in these inputs may significantly impact the indicator. Additionally, there could be potential correlations not accounted for among our set of variables, meaning that prediction in New Home Sales demand changes could be amplified.

These indicators are not intended to be the sole driver of our ratings but they may have an impact on our views of the Home Building stocks we cover. They are not intended to be indicative of actual or future performance of any stock individually or as a group.

Variable Trends

Exhibit 24: 30y Fixed Mortgage rate

30y mortgage rate hitting highs of early '00s

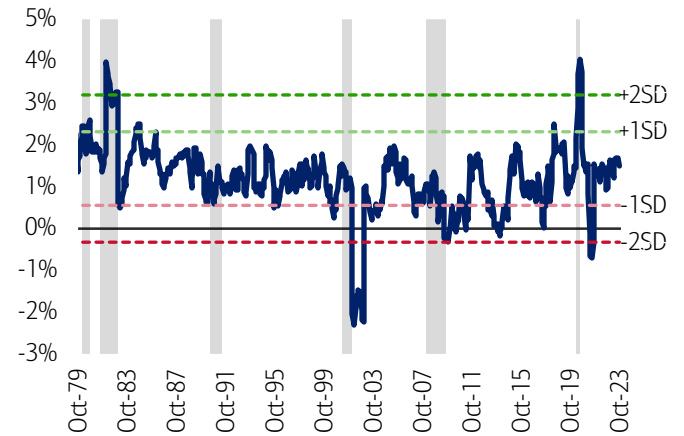


Source: Freddie Mac, BofA Global Research

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Exhibit 25: Household Estimates

Remains flat

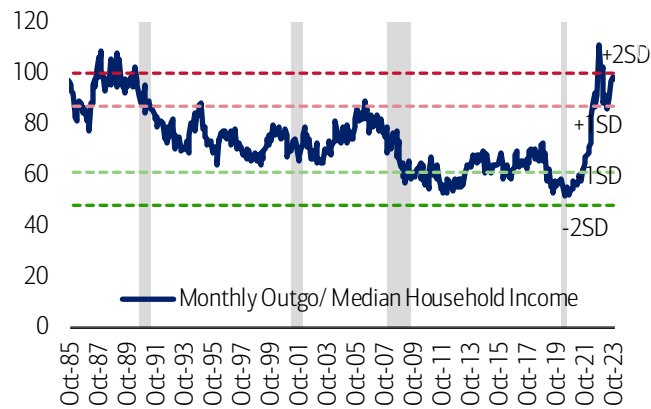


Source: U.S. Census Bureau, BofA Global Research

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Exhibit 26: P&I by Median Household Income

Affordability remains at record low

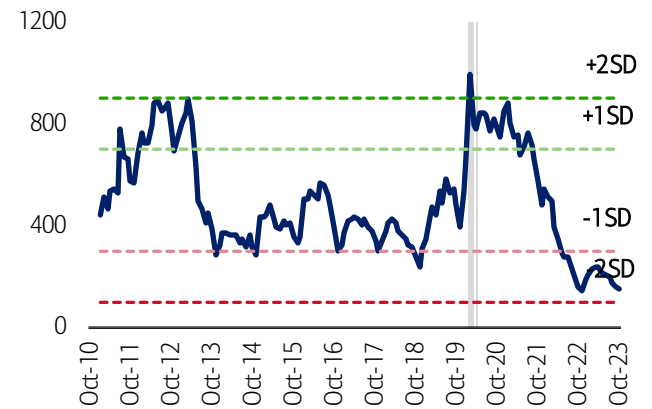


Source: U.S. Census Bureau, Freddie Mac, BofA Global Research

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Exhibit 27: Weekly Mortgage Applications

Mortgage application continue to remain below 1SD



Source: MBA, Datastream, BofA Global Research

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Exhibit 28: Respondents who say Mortgage Rates will go up

Outlook remains neutral

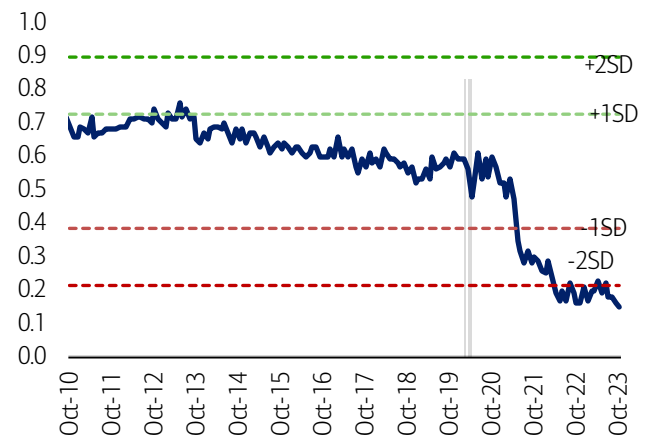


Source: Fannie Mae, BofA Global Research

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Exhibit 29: Net Percent of Respondents Who Say it is a Good Time to Buy

Buyer sentiment is the most negative print on record

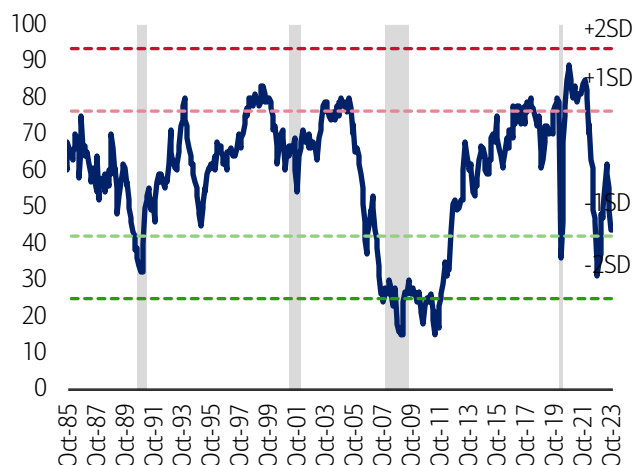


Source: Fannie Mae, BofA Global Research

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Exhibit 30: Single-Family: Next Six Months

Supply squeezed to lowest since May'22

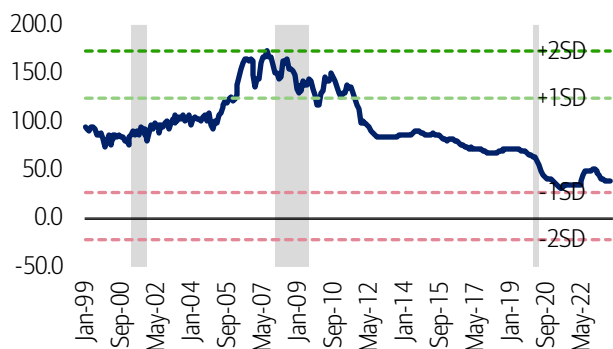


Source: NAHB, BofA Global Research

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Exhibit 32: US Existing Home Sale Inventory

Inventory hovering at one of the lowest levels



Source: NAR, Redfin.com, BofA Global Research

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Exhibit 34: Data category and description

Merchants are categorized based on products/services they provide

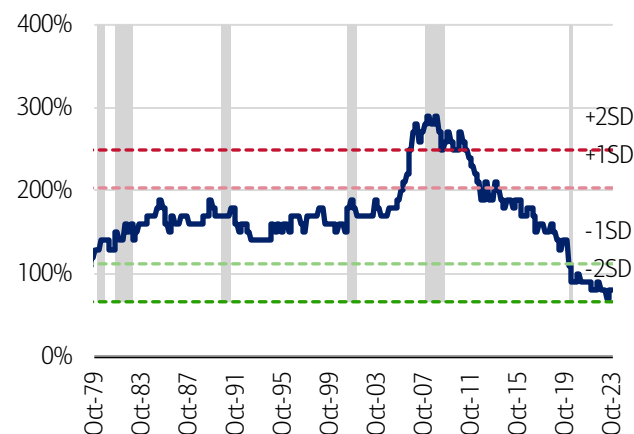
Data category	Description
Building materials	Merchants that sell a wide range of home/housing products and supplies
Housing-related services	Merchants/individual professionals that provide plumbing, flooring, painting, carpentry or other home-related services
Flooring	Merchants that sell floor coverings
Furniture	Merchants that sell furnishing items, such as sofas, dressers, tables, chairs
Premium furniture	Merchants that sell high-end furnishing items
Mattress	Merchants that sell bedding and mattresses

Source: BofA Global Research

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Exhibit 31: Homeowner Vacancy Rate

Vacancies continue to remain at all time low

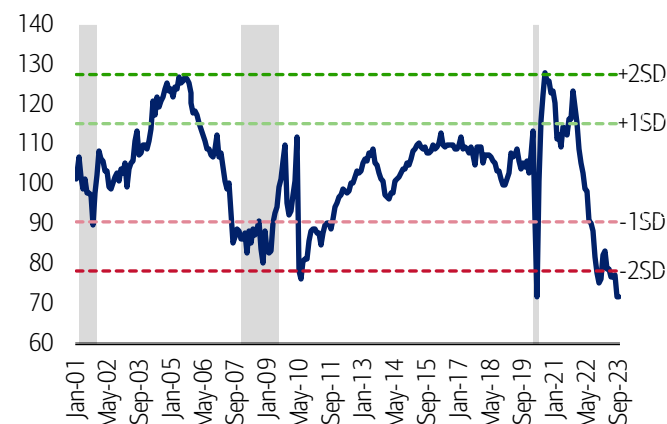


Source: U.S. Census Bureau, BofA Global Research

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Exhibit 33: Pending Home Sales

Pending home sales tracking at the lowest level on absolute basis



Source: NAR, Redfin.com, BofA Global Research

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Disclaimer and Methodology regarding BAC internal data

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Methodology explained

Readers should be aware that although the BAC datasets utilized in our analysis represent a significant number of data points, they nevertheless present a degree of selection bias, including but not limited to income levels and geographies. In addition, the data is limited to debit and credit cards and does not include other payment methods such as cash or checks.

Data regarding merchants who receive payments are identified and classified by the Merchant Categorization Code (MCC) defined by financial services companies. The data are mapped using proprietary methods from the MCCs to the North American Industry Classification System (NAICS), which is also used by the Census Bureau, in order to classify spending data by subsector. Spending data may also be classified by other proprietary methods not using MCCs.

BAC data used in this report include spending from active US households only. Spending from corporate cards are excluded.

Our methodology for calculating the growth rates for daily data: we calculate the %y/y growth rate and the 4-year % change by matching calendar days (Jan 1 2023 is matched to Jan 1 2022, and Jan 1, 2019, respectively). The % change is calculated based on the 7-day moving average of spending levels.

Additional information about the methodology used to aggregate the data is available upon request.

Disclosures

Important Disclosures

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R1}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R1} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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