APOLLO

US Housing Outlook:
A housing recovery has started, driven by low supply and pent-up demand boosted by falling mortgage rates

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Legal Disclaimer

A housing recovery has started driven by:

1. Low housing supply

2. Pent-up demand boosted by falling mortgage rates

3. Decent job growth

4. Robust wage growth

5. Still some excess savings left

Leading indicators of the housing market

Home price inflation rebounding

%YoY — CPI-U: Rent of Primary Residence
— CPI-U: Owners' Equivalent Rent of Residences
— S&P CoreLogic Case-Shiller Home Price Index (14 month lead) (RHS) %YoY
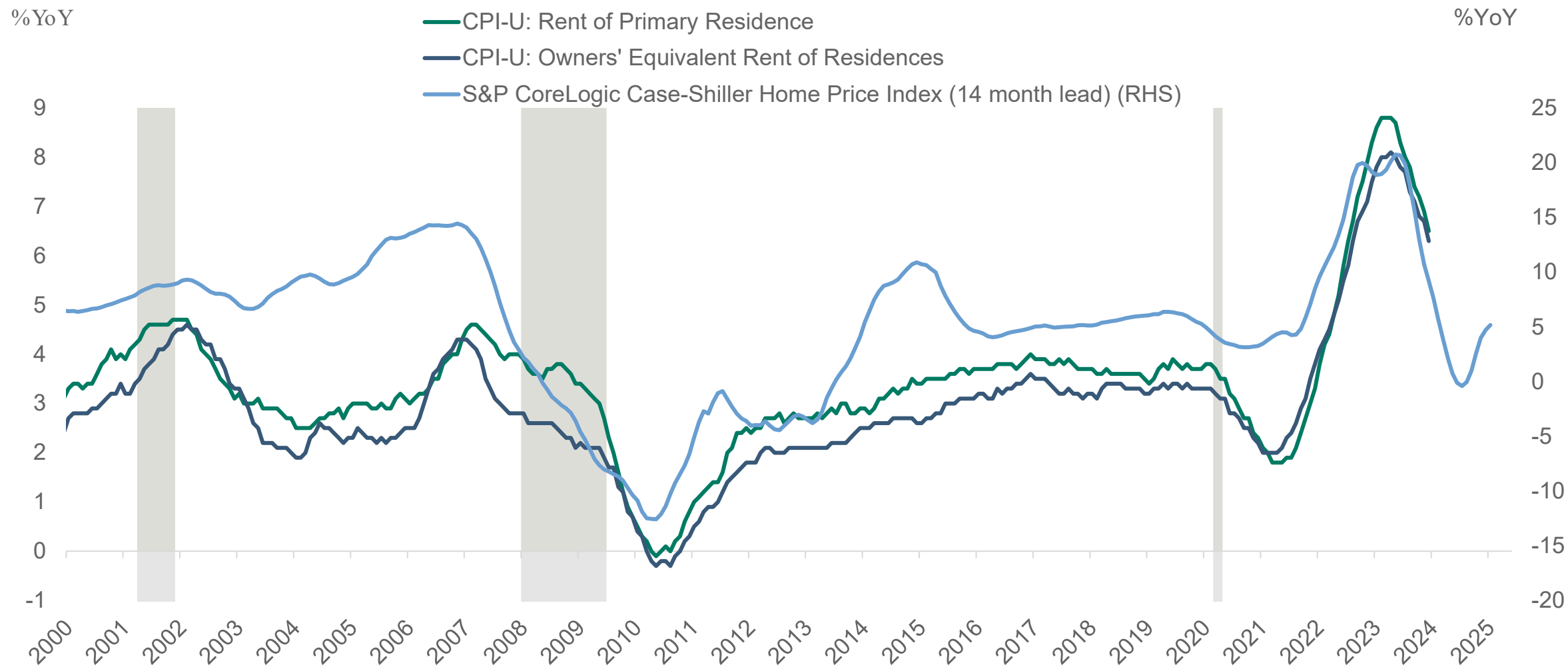
Rent inflation rising in small cities and elevated in large cities

CPI-U: Rent of Primary Residence

— Large cities — Small cities
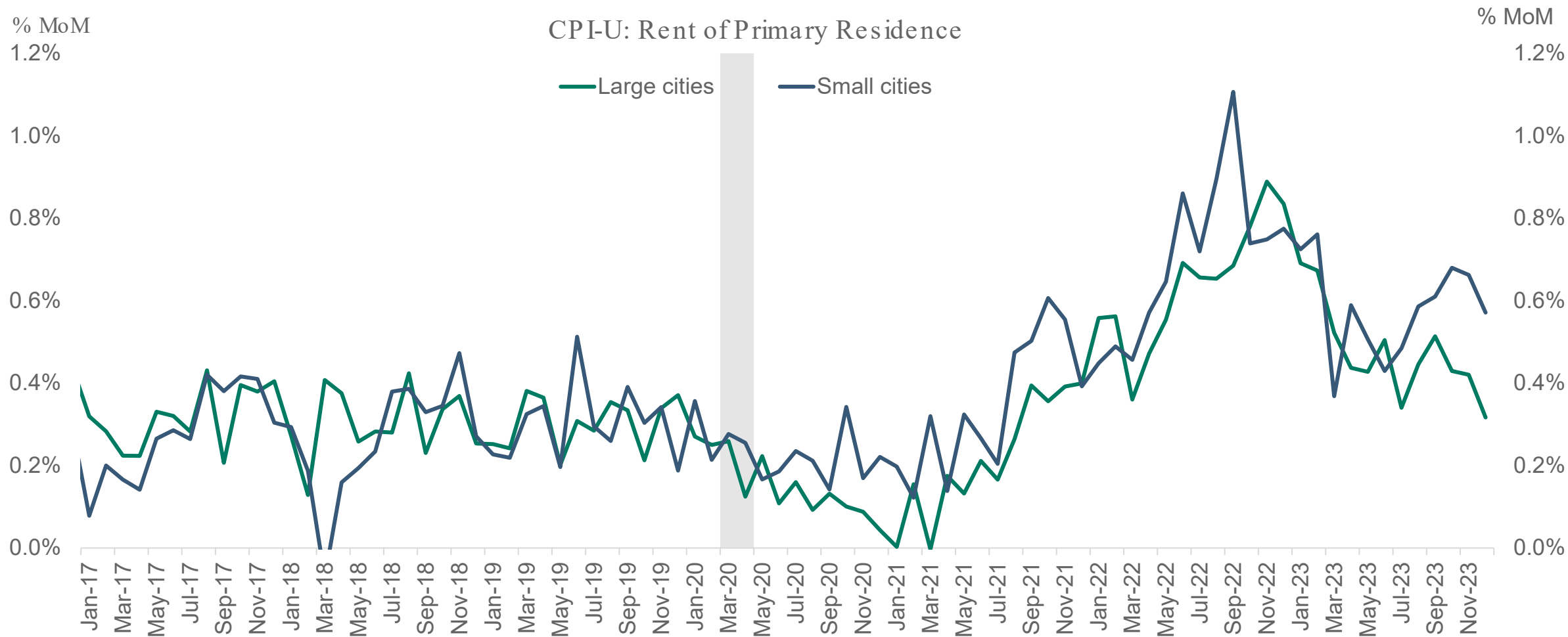
Rebound coming in housing inflation

%YoY (left axis): 9, 8, 7, 6, 5, 4, 3, 2, 1, 0

%YoY (right axis): 24, 21, 18, 15, 12, 9, 6, 3, 0, -3, -6

Legend:
- CPI Owners Equivalent Rent
- Zillow Observed Rent Index (9 month lead, RHS)
- Apartment List (9 month lead, RHS)
- BLS New Tenant Repeat Rent Index (6 month lead, RHS)
- S&P Case-Shiller home price index (14 month lead, RHS)

X-axis: Jan-18, Apr-18, Jul-18, Oct-18, Jan-19, Apr-19, Jul-19, Oct-19, Jan-20, Apr-20, Jul-20, Oct-20, Jan-21, Apr-21, Jul-21, Oct-21, Jan-22, Apr-22, Jul-22, Oct-22, Jan-23, Apr-23, Jul-23, Oct-23, Jan-24, Apr-24, Jul-24, Oct-24, Jan-25

Source: BLS, S&P Case Shiller, Zillow, Haver Analytics, Apollo Chief Economist

100 largest US cities: Share of cities with positive rent growth is rising

Legend: ■ Negative rent growth (yoy) ■ Positive rent growth (yoy)
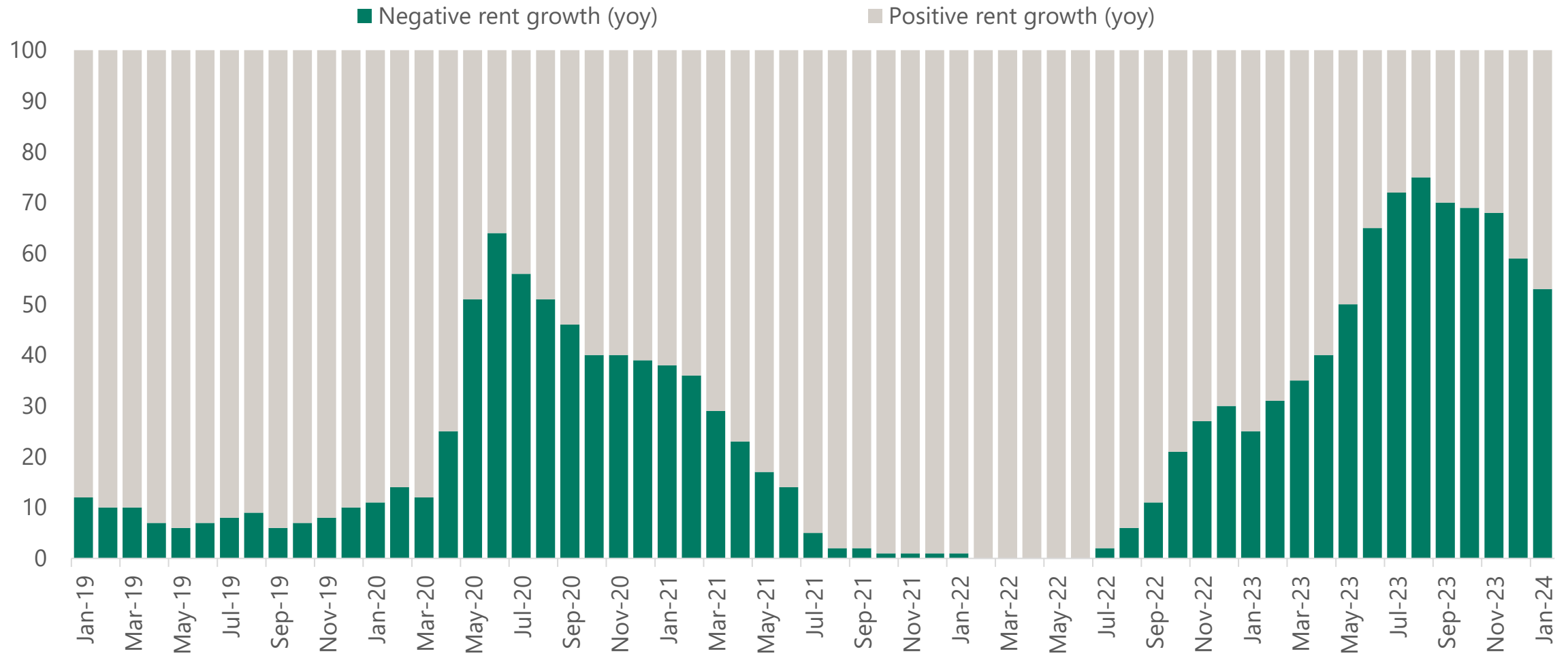
Mortgage purchase applications have started to recover

MBA US Purchase Index

Index

Index

Legend: 2019 — 2020 — 2021 — 2022 — 2023 — 2024

Week
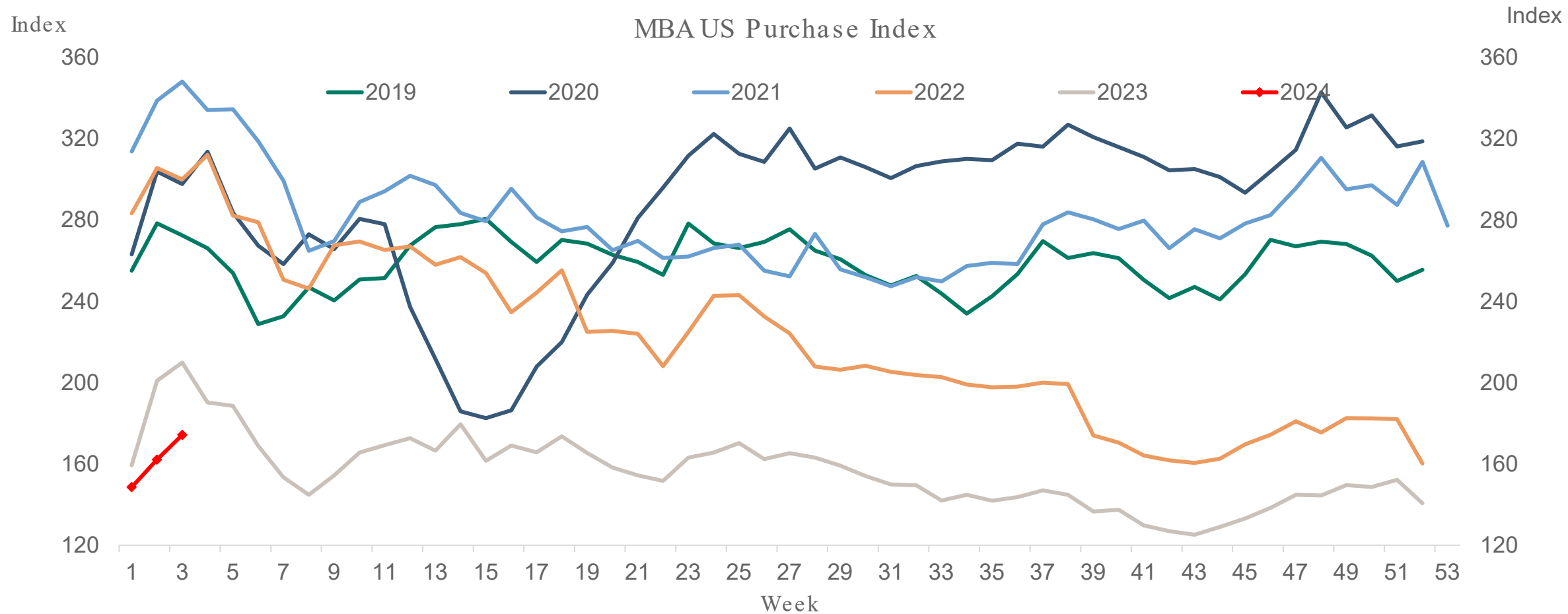
Source: Mortgage Bankers Association, Bloomberg, Apollo Chief Economist

Residential new listings starting to rebound

SA, Thousands

Residential: New Listings

The Fed starts raising rates
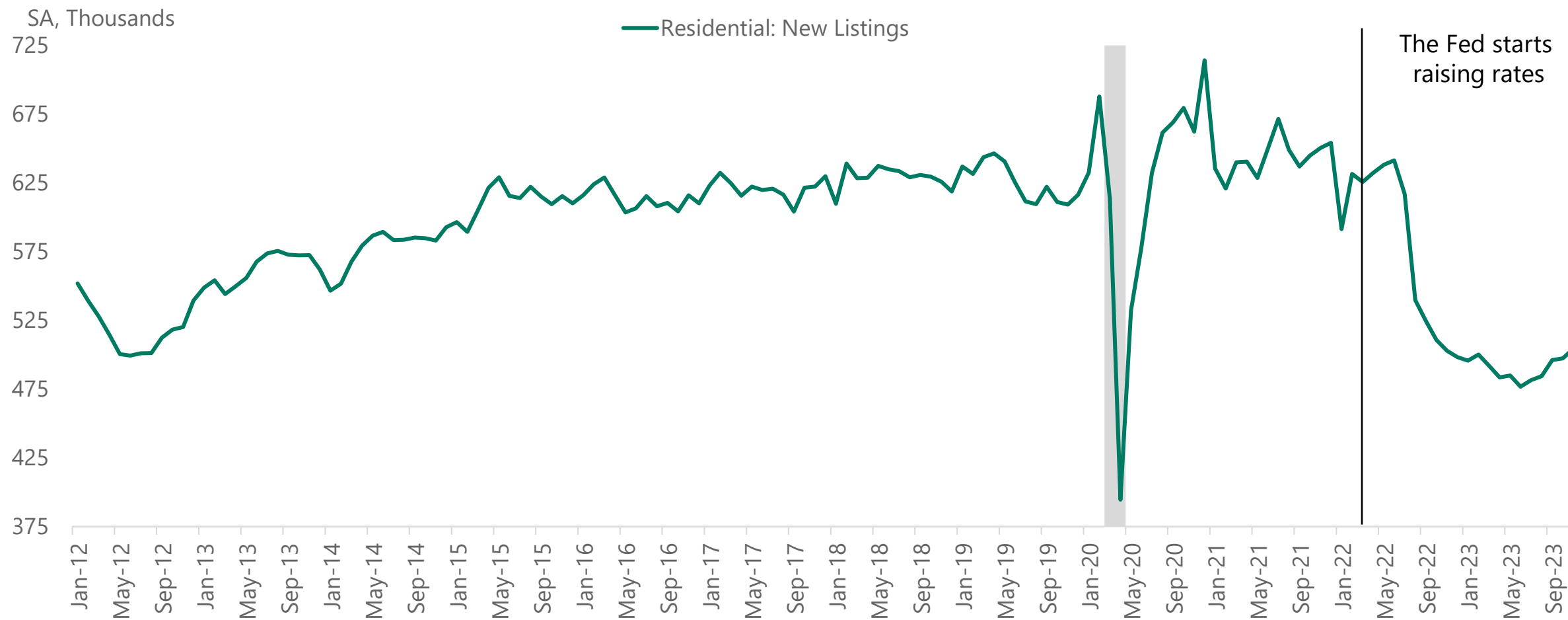
Source: Redfin, Haver Analytics, Apollo Chief Economist.

The jump in housing starts points to a jump in new home sales

SAAR, Thous.

SAAR, Thous.

New single-Family home sales (ls)   Single-family housing starts (rs)
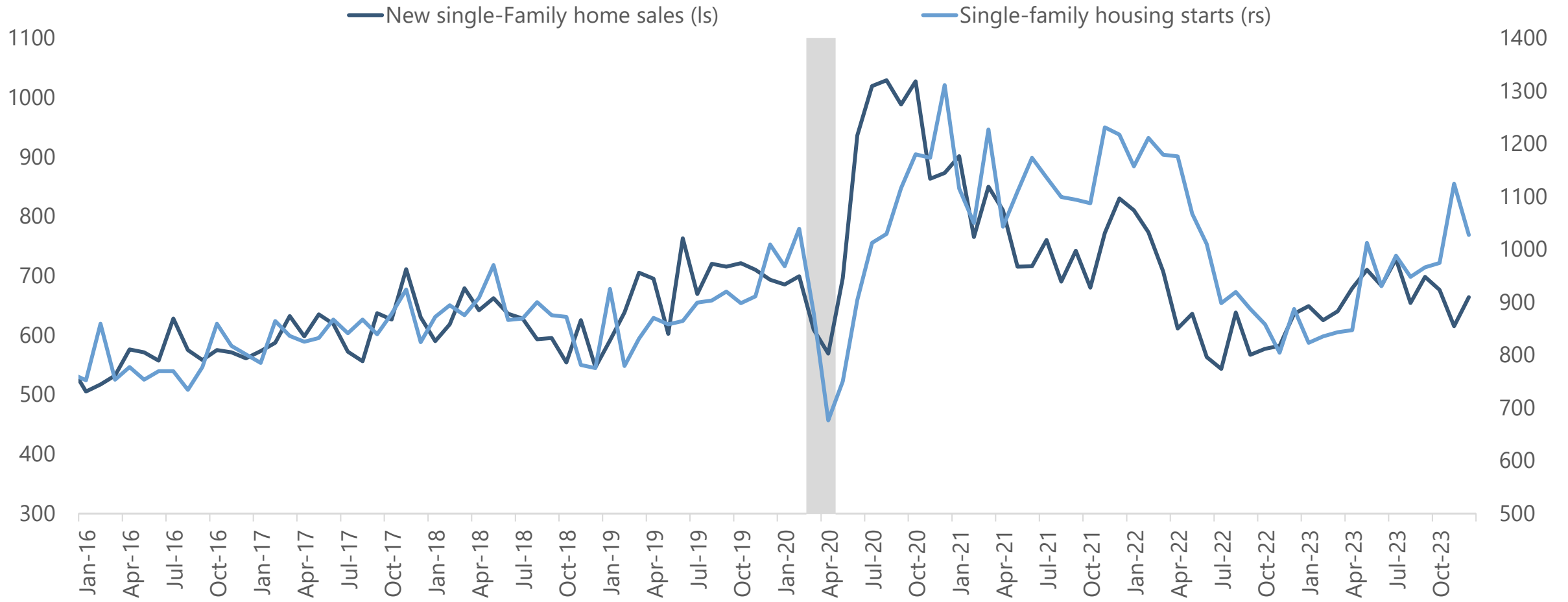
Traffic of prospective homebuyers bottoming out
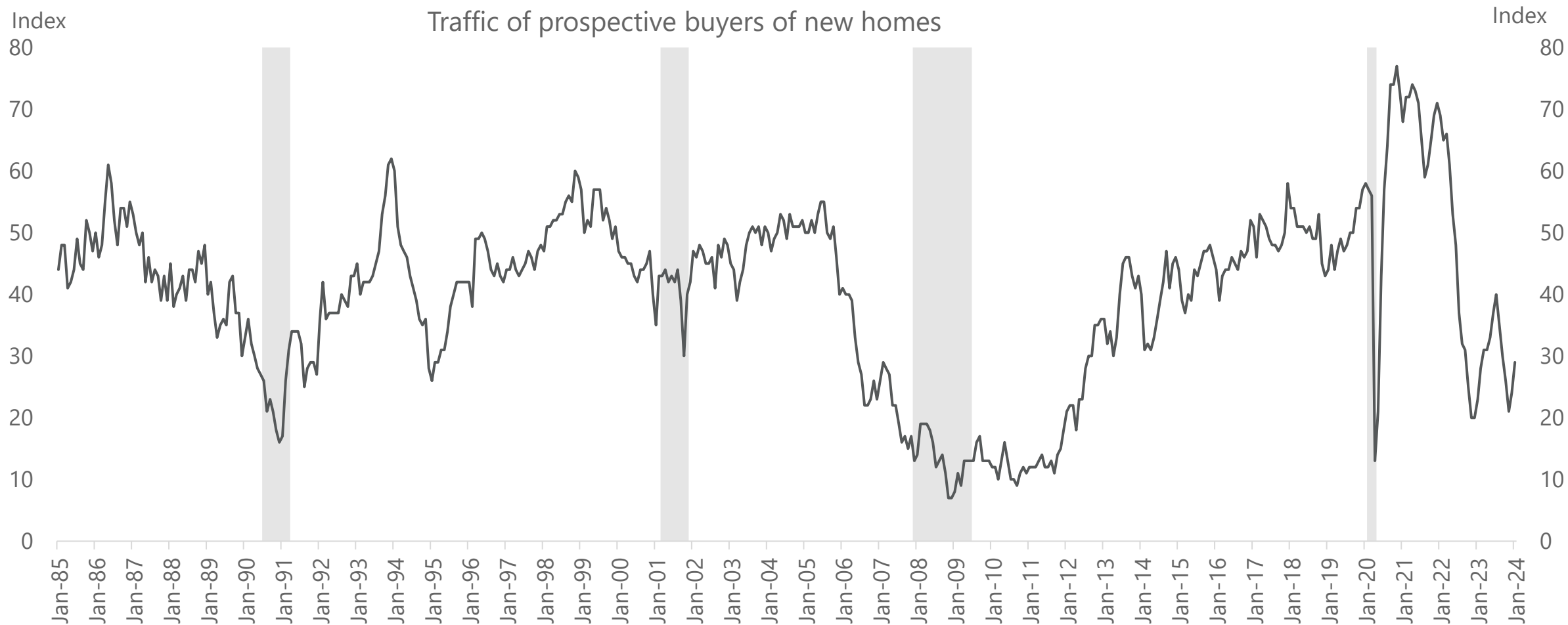
Traffic of prospective buyers of new homes

New home sales steady

Saar, thous.

— Total Existing Home Sales   — New 1-Family Houses Sold (rs)

Saar, thous.
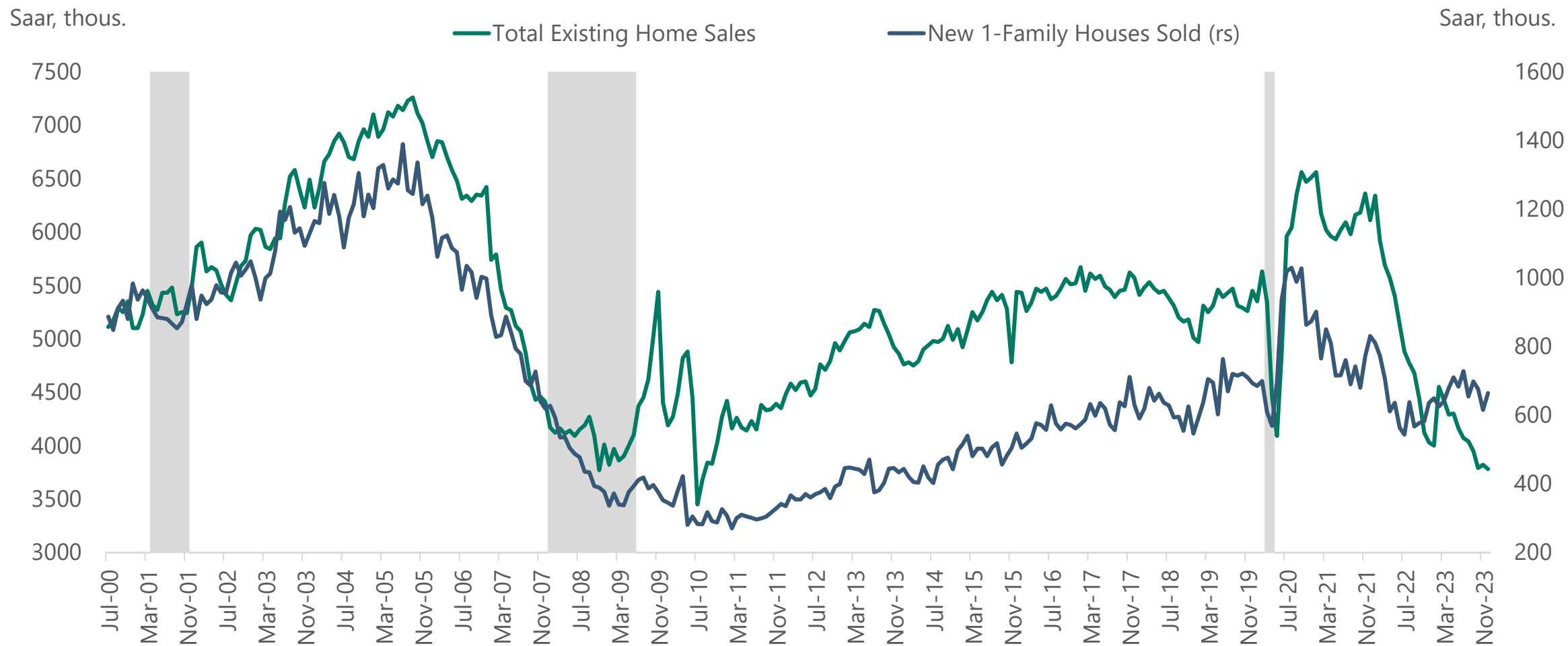
Source: Census Bureau, NAR, Haver, Apollo Chief Economist; Forecast is Bloomberg consensus

Home price inflation solid because of low inventory of homes for sale
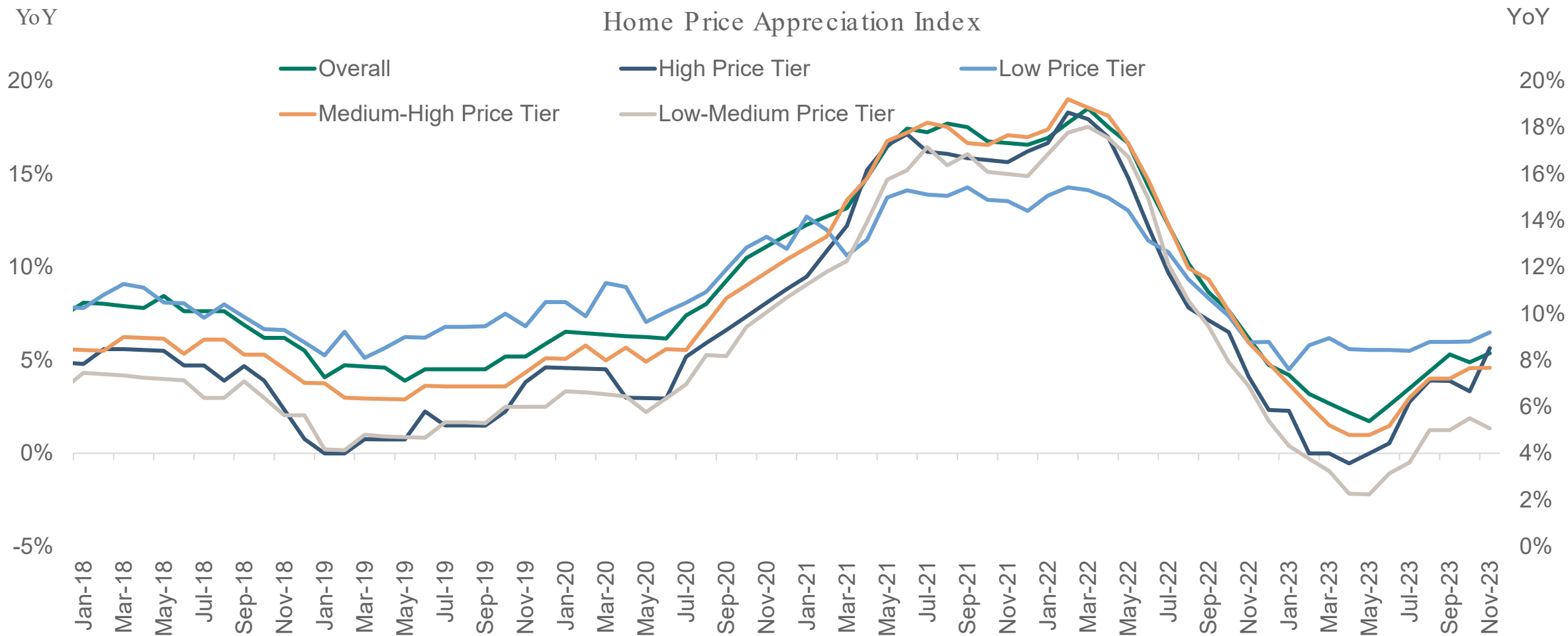
Home Price Appreciation Index

Legend: Overall, High Price Tier, Low Price Tier, Medium-High Price Tier, Low-Medium Price Tier

14

Home price inflation solid because of low inventory of homes for sale

Median single-family existing home price

—National —Northeast —Midwest —South —West

Source: NAR, Haver, Apollo Chief Economist
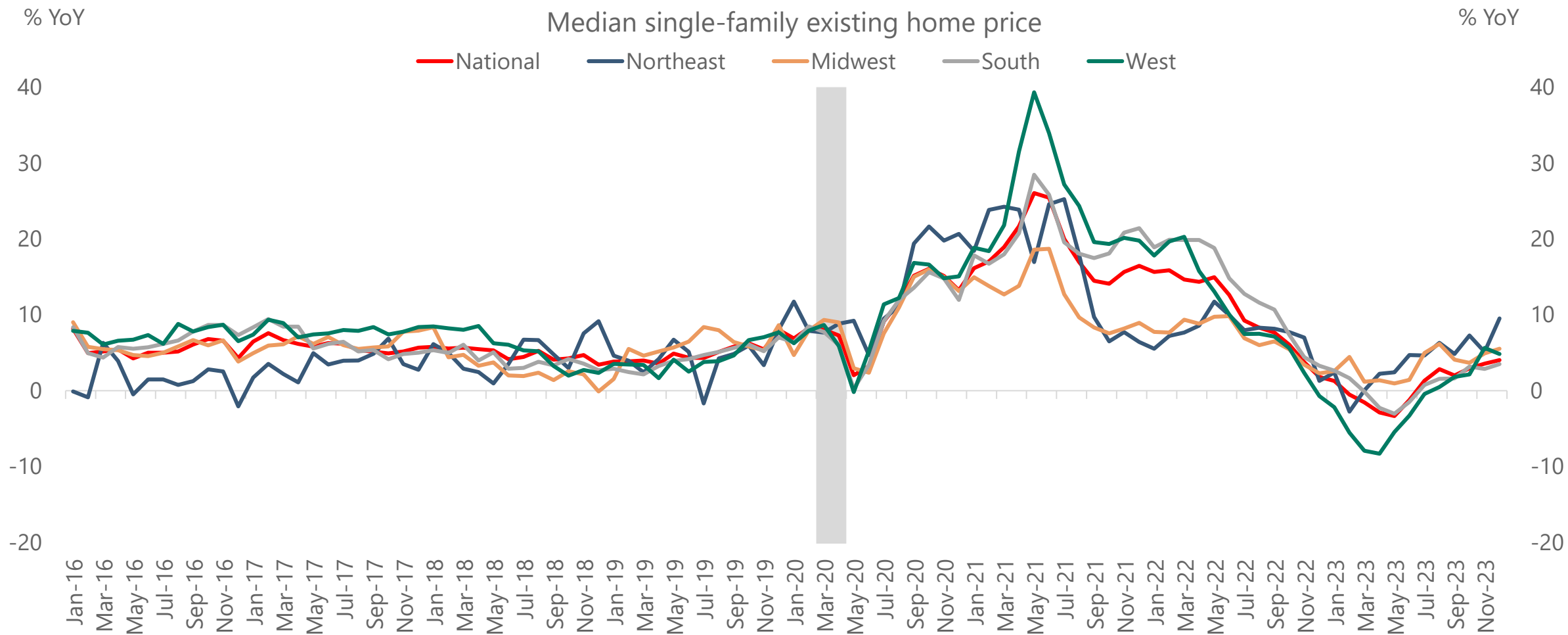
Homebuyer and homebuilder confidence bottoming

Index — Home Builders: Housing Market Index (Homebuilder confidence)
— Current Conditions for Buying Houses (Homebuyers confidence) (RHS) Index
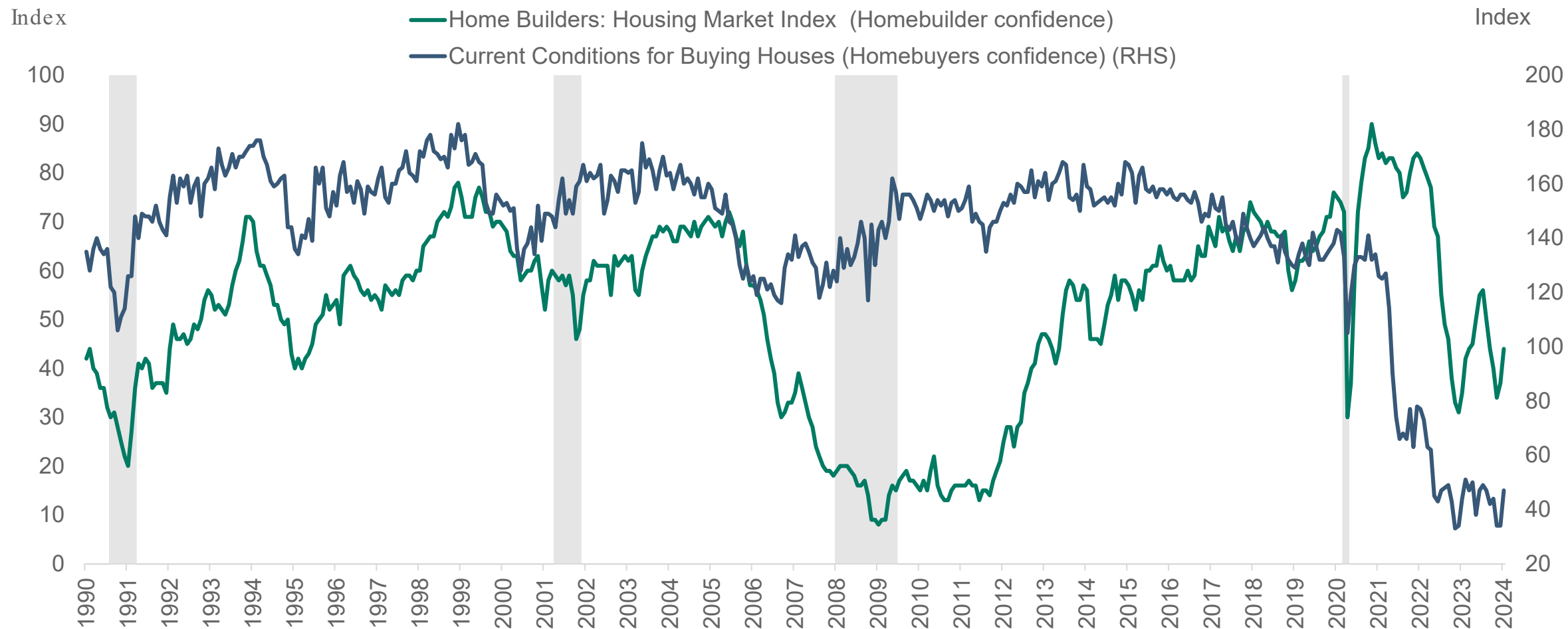
If homebuilder confidence rebounds over the coming months because of the Fed pivot, residential investment will also rebound

Index, 6 month change   —Home Builders: Housing Market Index   —Real Private Residential Fixed Investment (RHS)   %, 2 quarter change

Source: BEA, NAHB, Haver Analytics, Apollo Chief Economist

Very low inventory of homes for sale

US housing inventory, active listings

mn units

2018   2019   2020   2021   2022   2023

Source: Realtor.com, Apollo Chief Economist

18
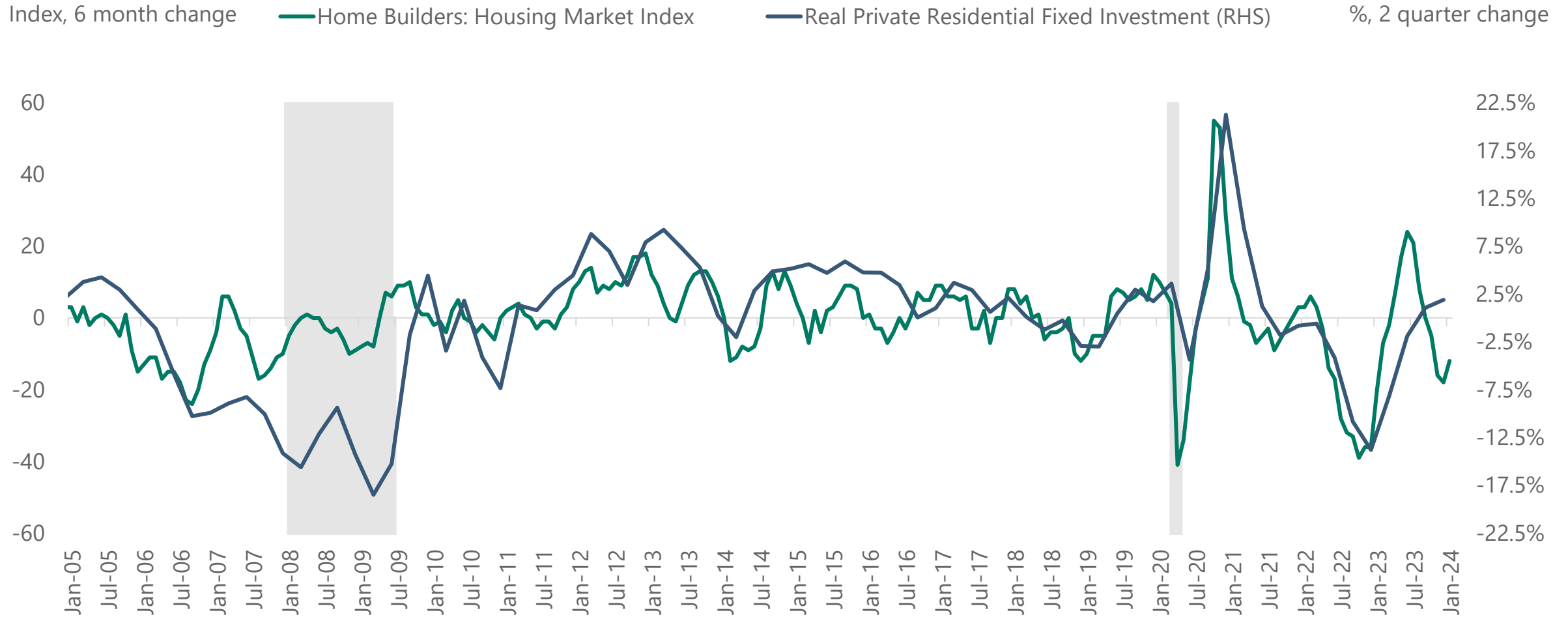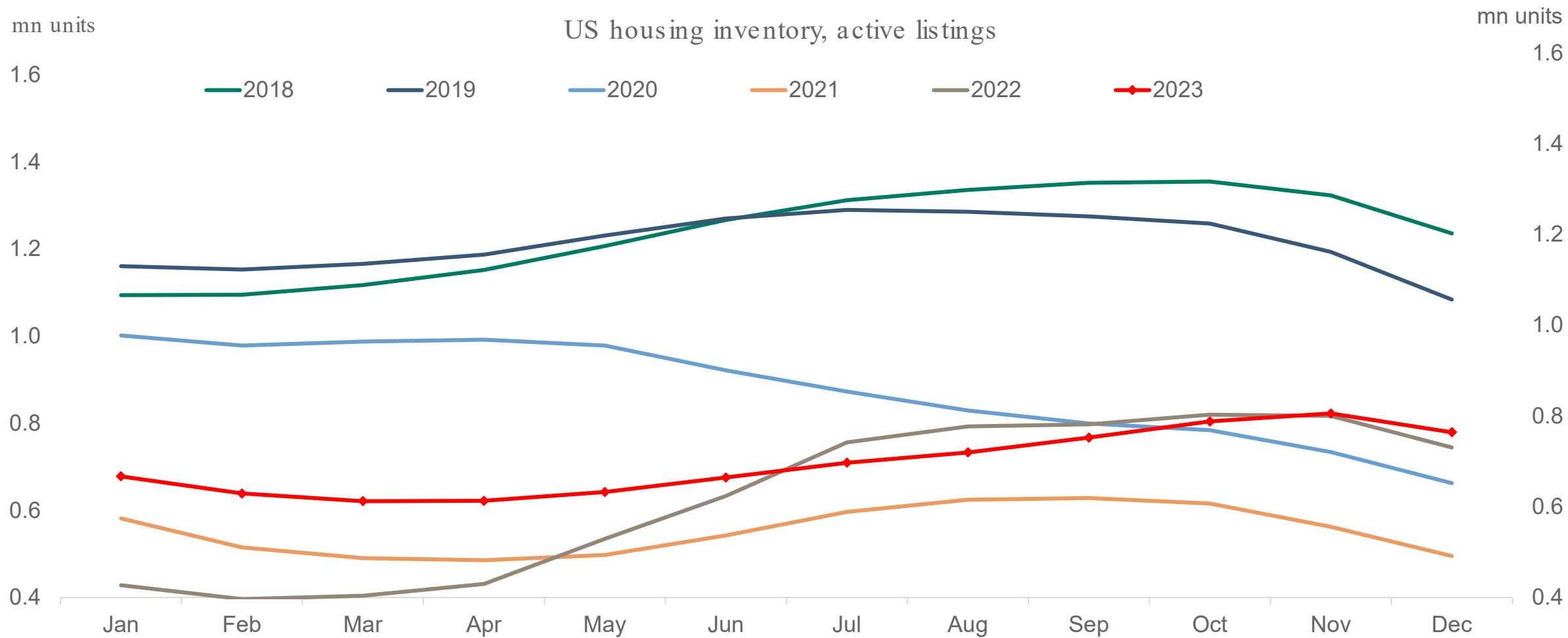
Investors account for 16% of all home purchases, down from 20% in 2022
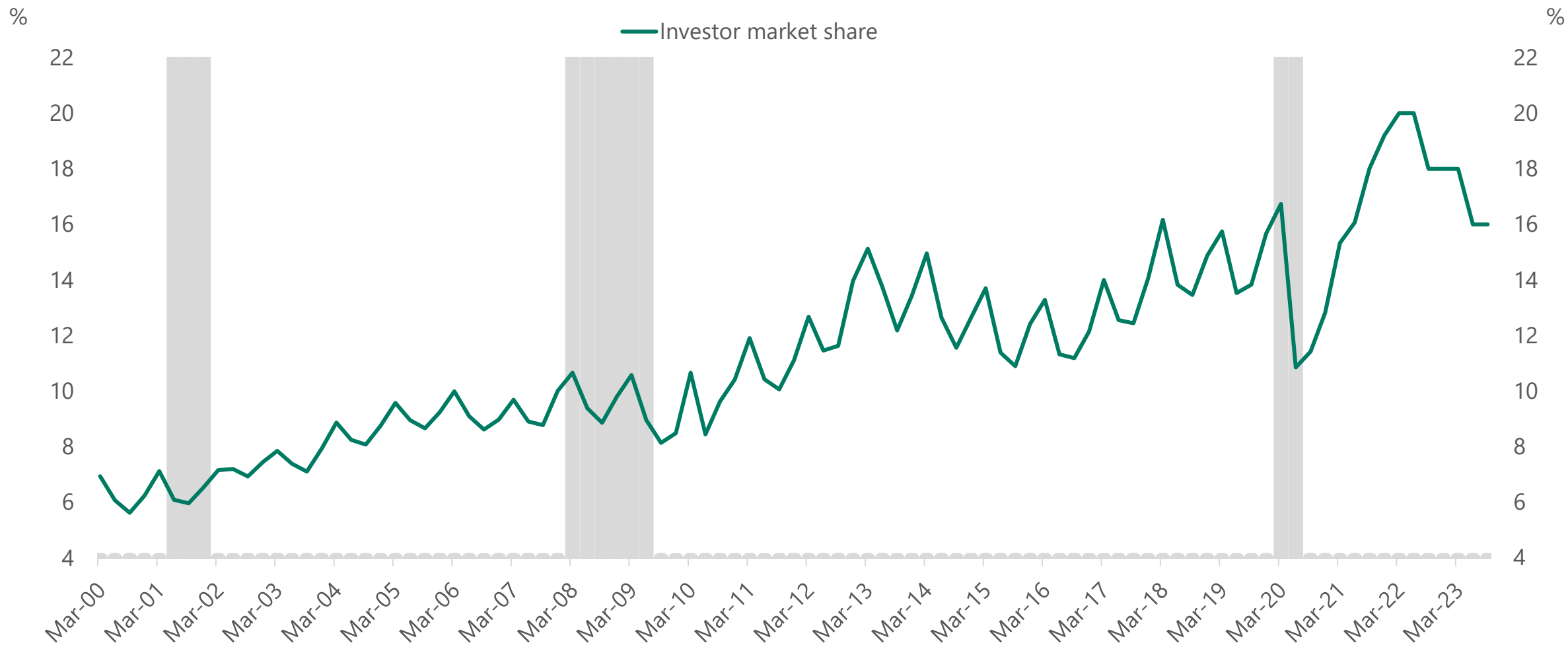
Source: Redfin, Apollo Chief Economist. Definition of Investor market share: the percentage of total home sales in which an investor was the buyer.

ARM share of total mortgage applications has declined recently

Adjustable-rate mortgage share of conventional applications
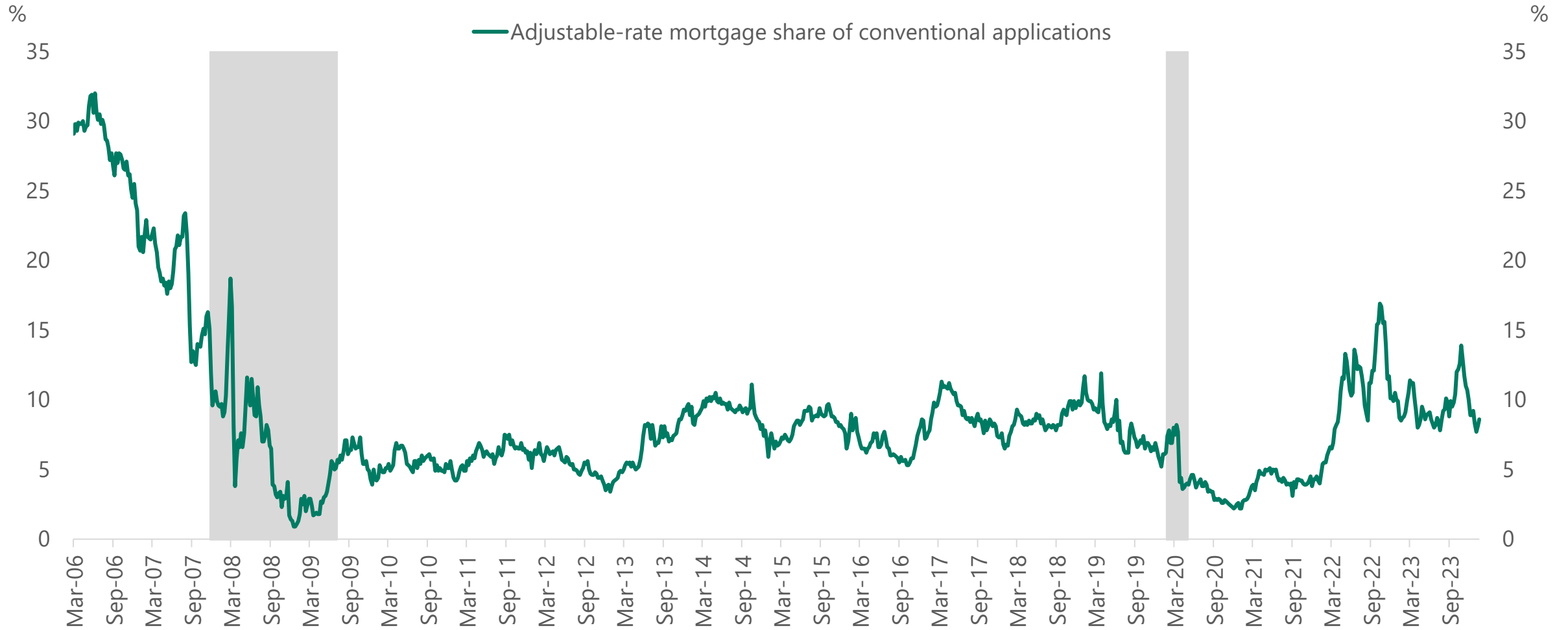
Existing housing inventory starting to rise

Existing home inventory

SA, Months

SA, Units, mn

— Months' Supply of Total Existing Homes   — Total Existing Homes Available for Sale (RHS)

Source: NAR, Apollo Chief Economist
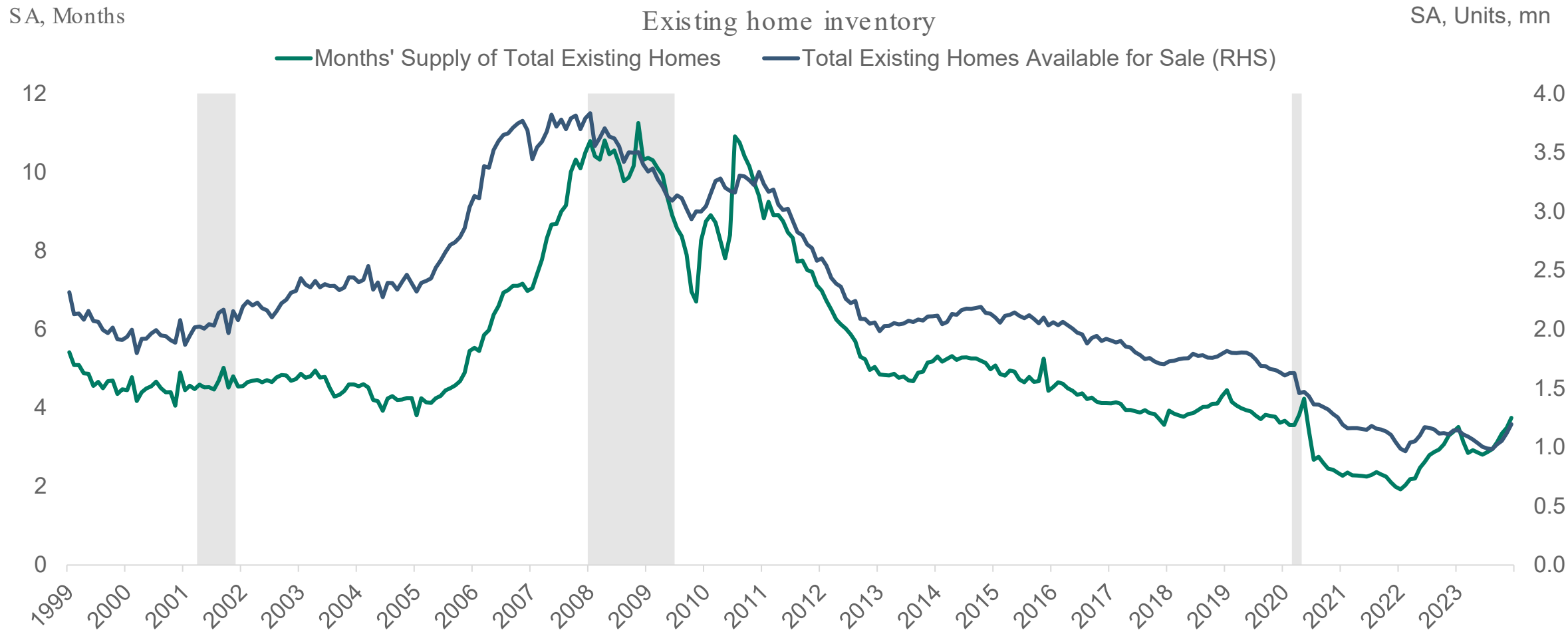
Total housing inventory per person continues to decline

Units per person

Housing inventory estimate: Total housing units/Household

Units per person
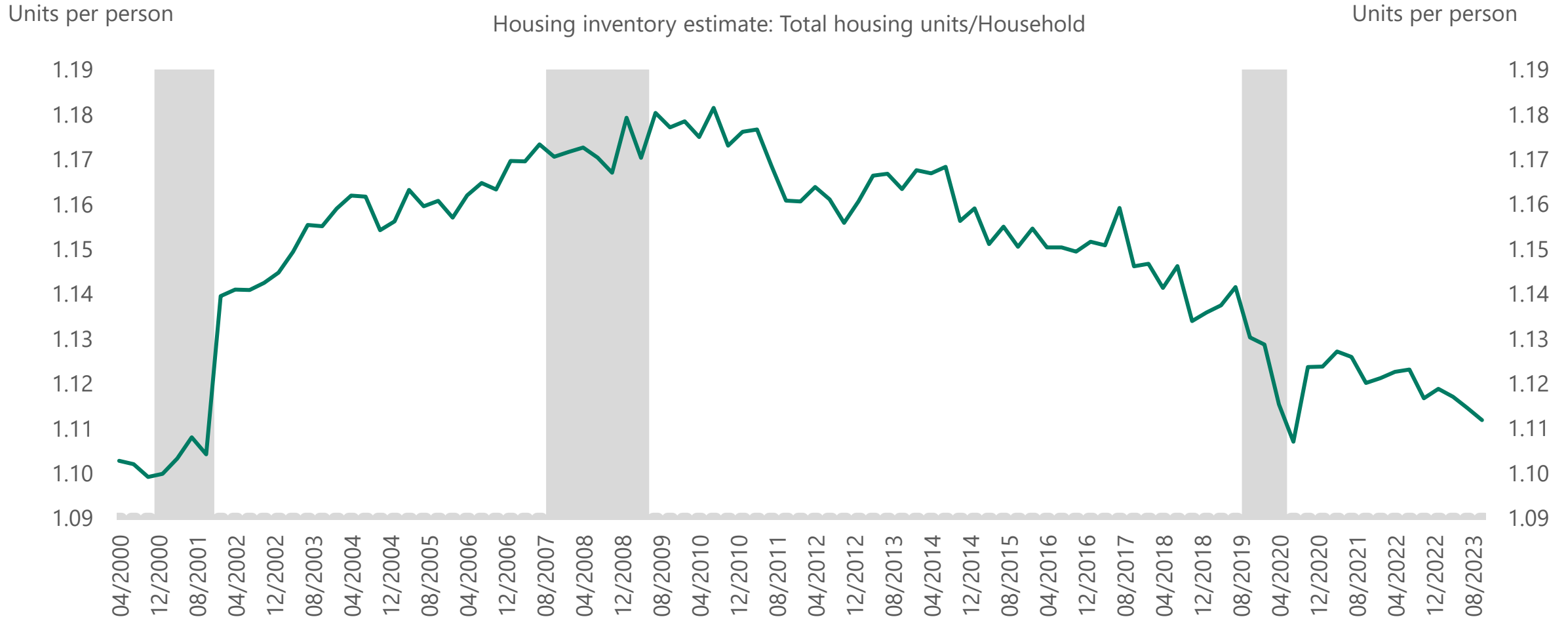
Almost 40% of US homes don't have a mortgage

Share of mortgage-free homes in the US
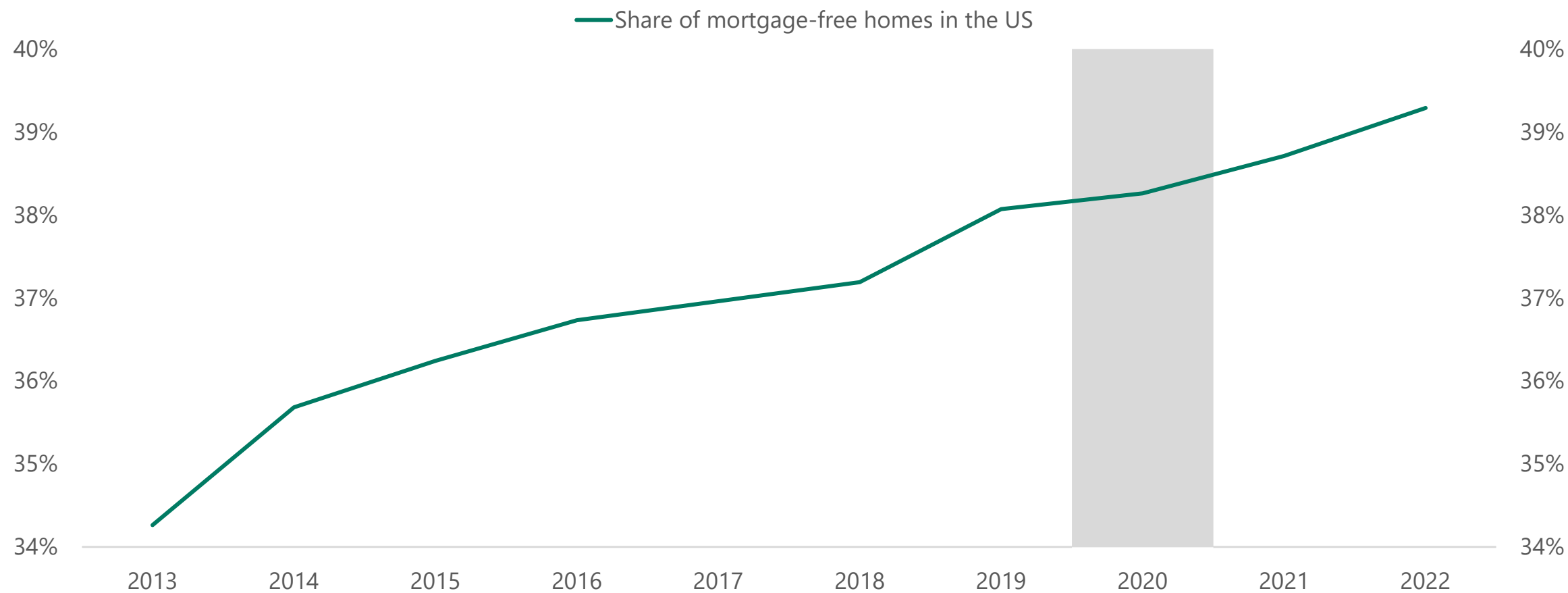
Low inventory boosting housing starts despite low affordability
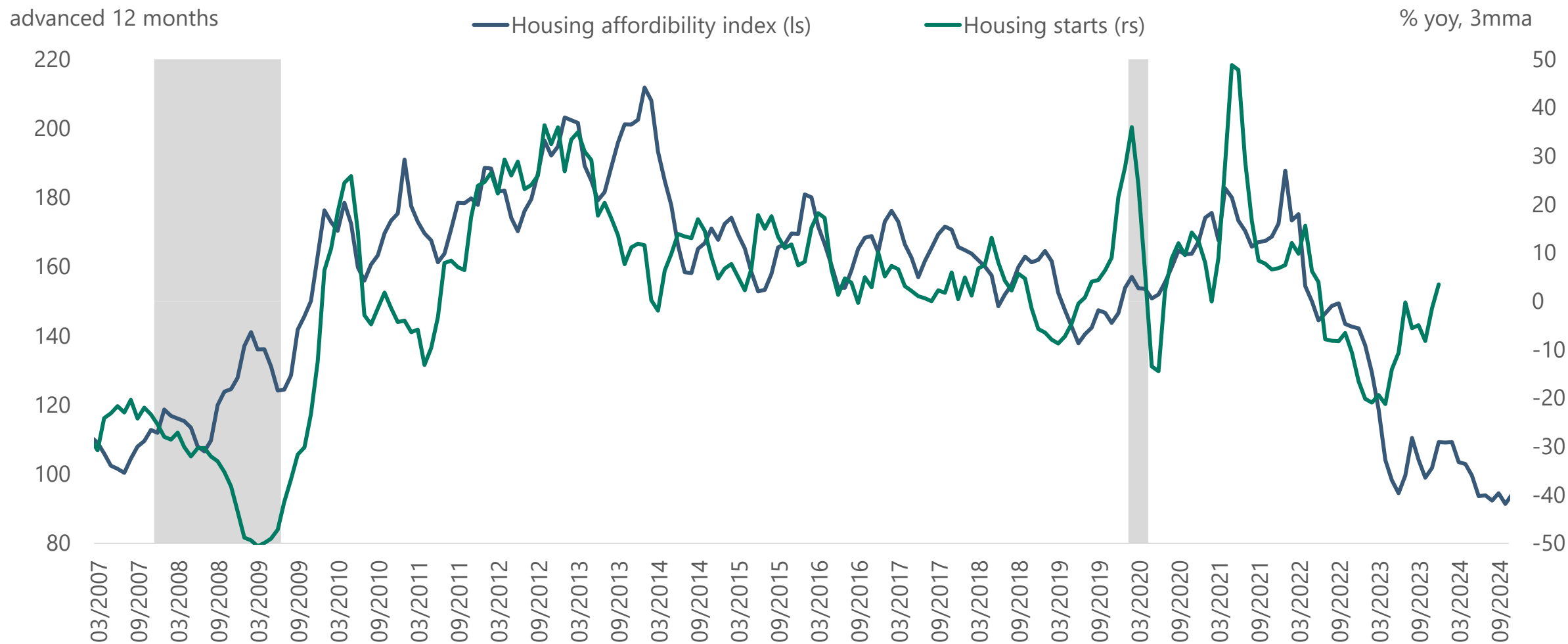
Distribution of interest rates on outstanding mortgages

Distribution of mortgages outstanding, by interest rates

Q2 2021 | Q2 2022 | Q2 2023 | Q3 2023

	Below 3%	3 to 4%	4 to 5%	5 to 6%	Above 6%
Q2 2021	19	40	25	10	6
Q2 2022	23	39	23	9	6
Q2 2023	22	36	22	12	9
Q3 2023	19	28	17	12	24
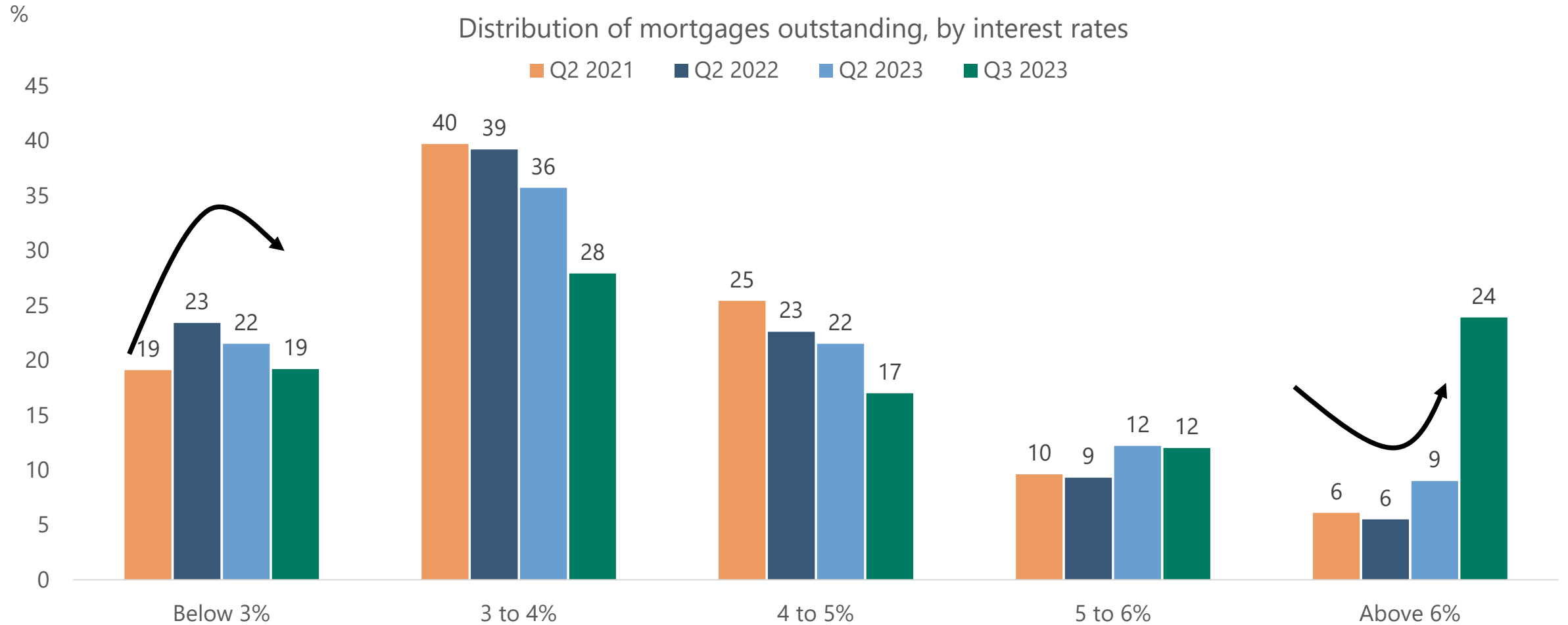
Effective outstanding mortgage rate is 3.8%
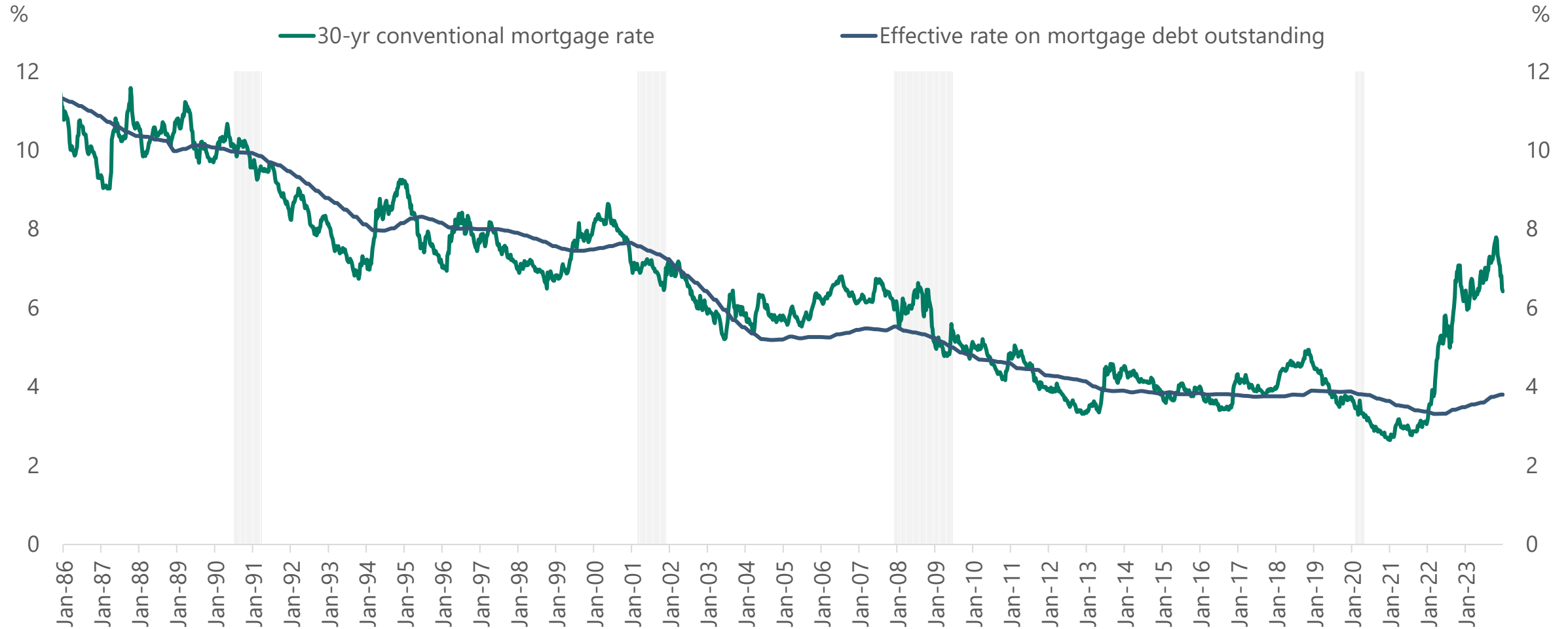
Source: Freddie Mac, BEA, Bloomberg, Apollo Chief Economist. The effective interest rate (%) reflects the amortization of initial fees and charges over a 10-year period, which is the historical assumption of the average life of a mortgage loan.

Monthly mortgage payment on a new mortgage has risen recently

─── 30-year mortgage payment

Source: Bloomberg L.P., Apollo Chief Economist (Note: Calculation of monthly payment using the 30-year purchase loan application size and the 30-yr effective rate.
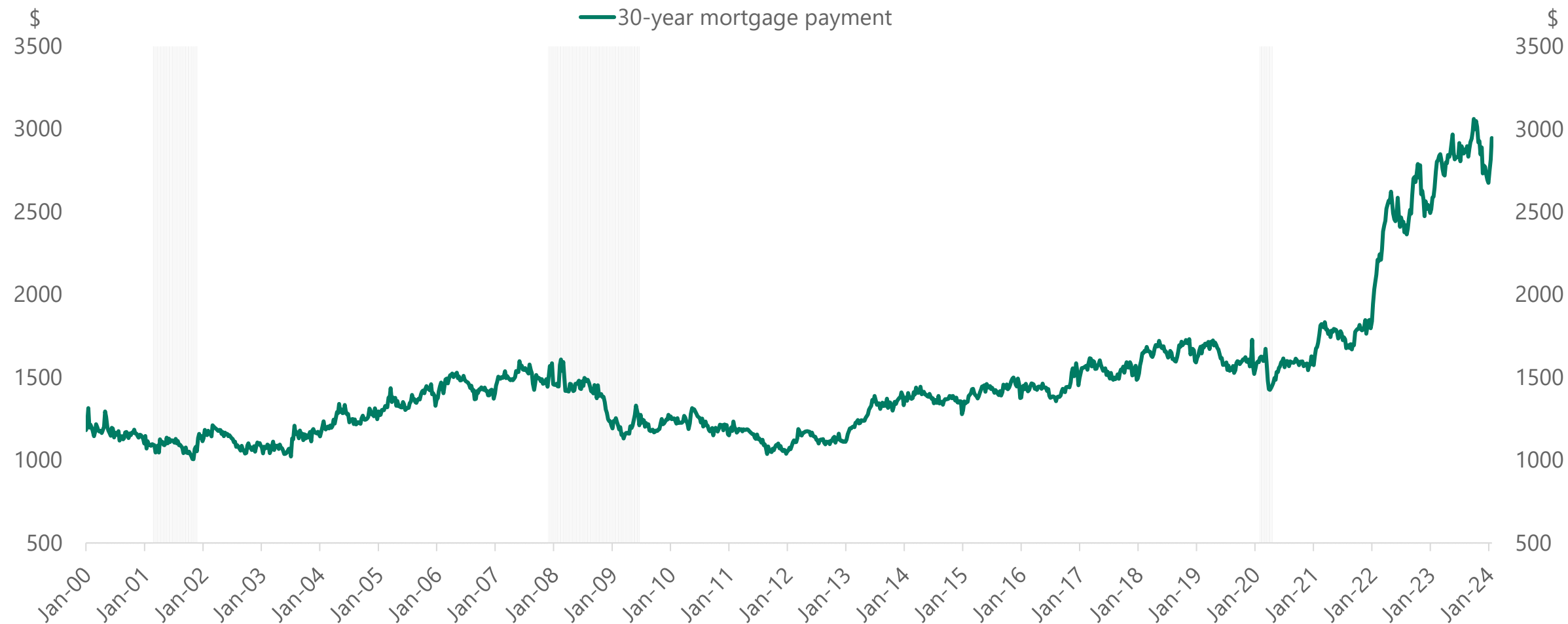
Record-low number of homeowners are refinancing their mortgage at the moment
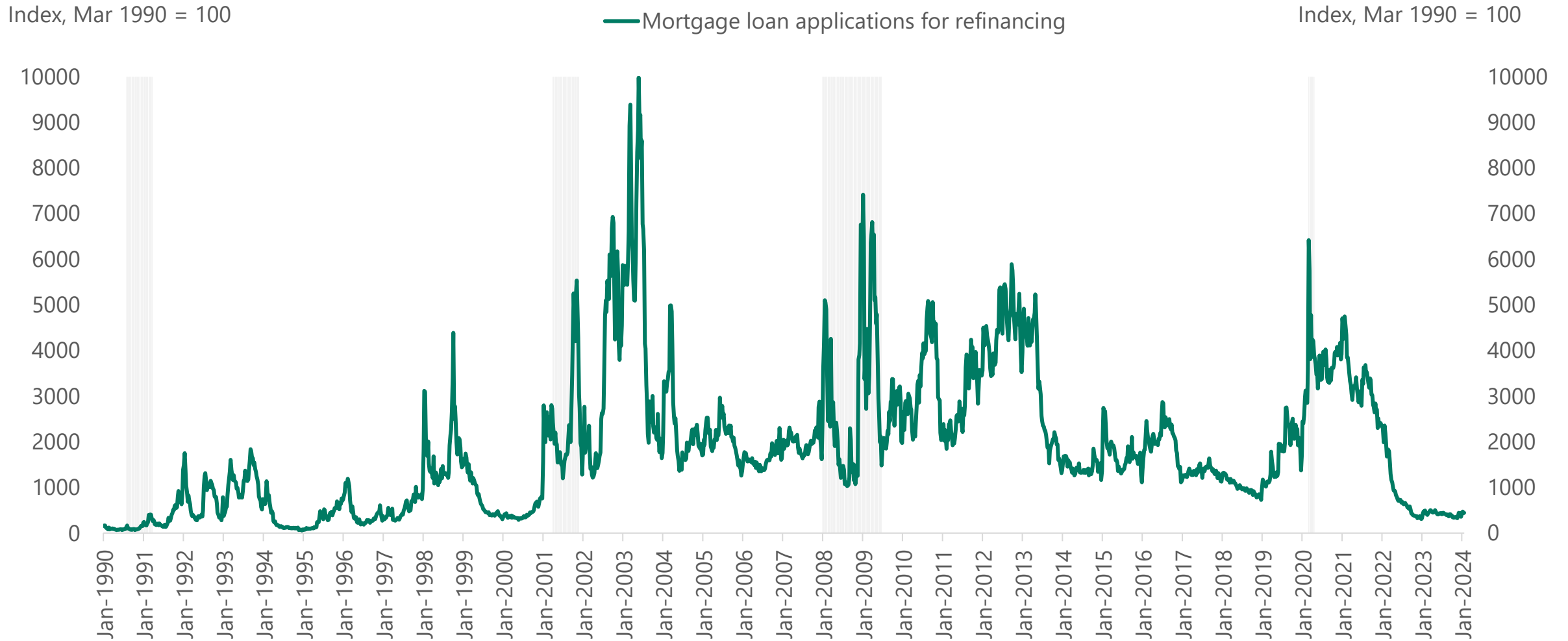
Index, Mar 1990 = 100

—— Mortgage loan applications for refinancing

Index, Mar 1990 = 100

Structural decline in the share of the US population moving to a new address

Share of US population that moved in the previous year

— All moves — Moves within county
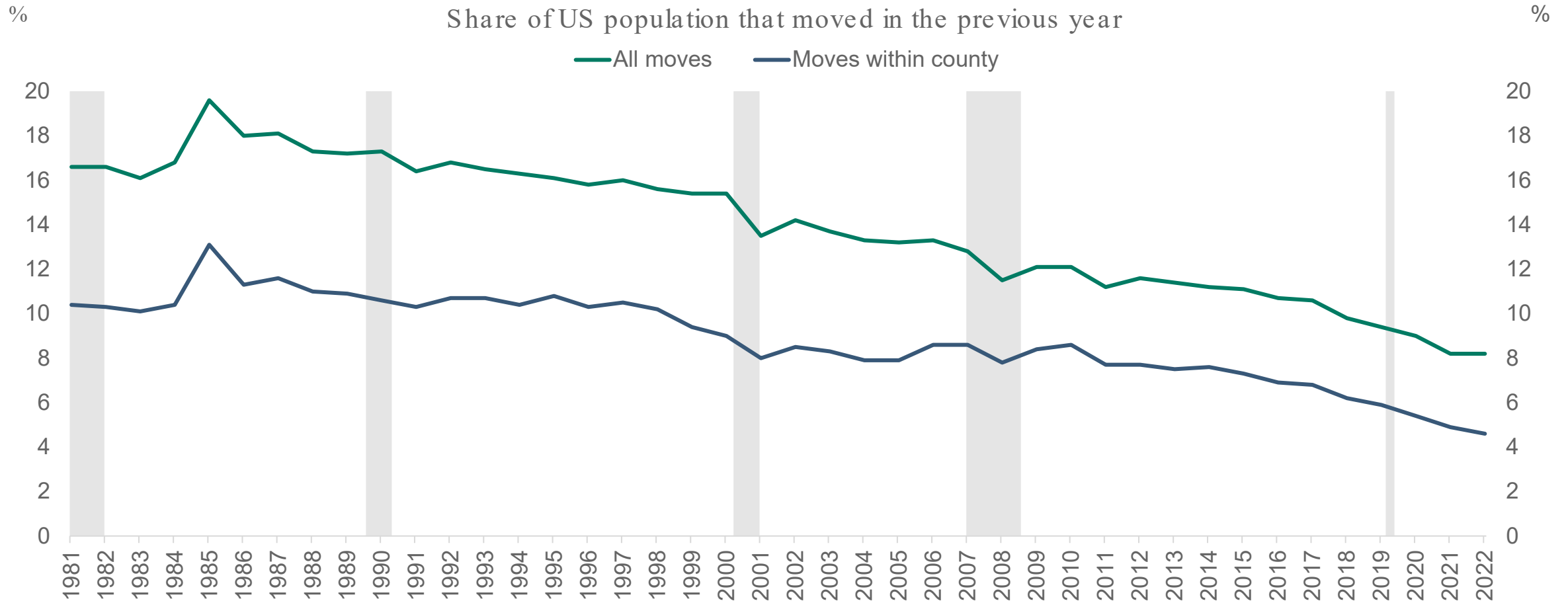
A very low share of households are planning to move

NY Fed Consumer survey: Mean Probability of changing Primary Residence over next 12 months

Source: FRB of NY, Haver Analytics, Apollo Chief Economist
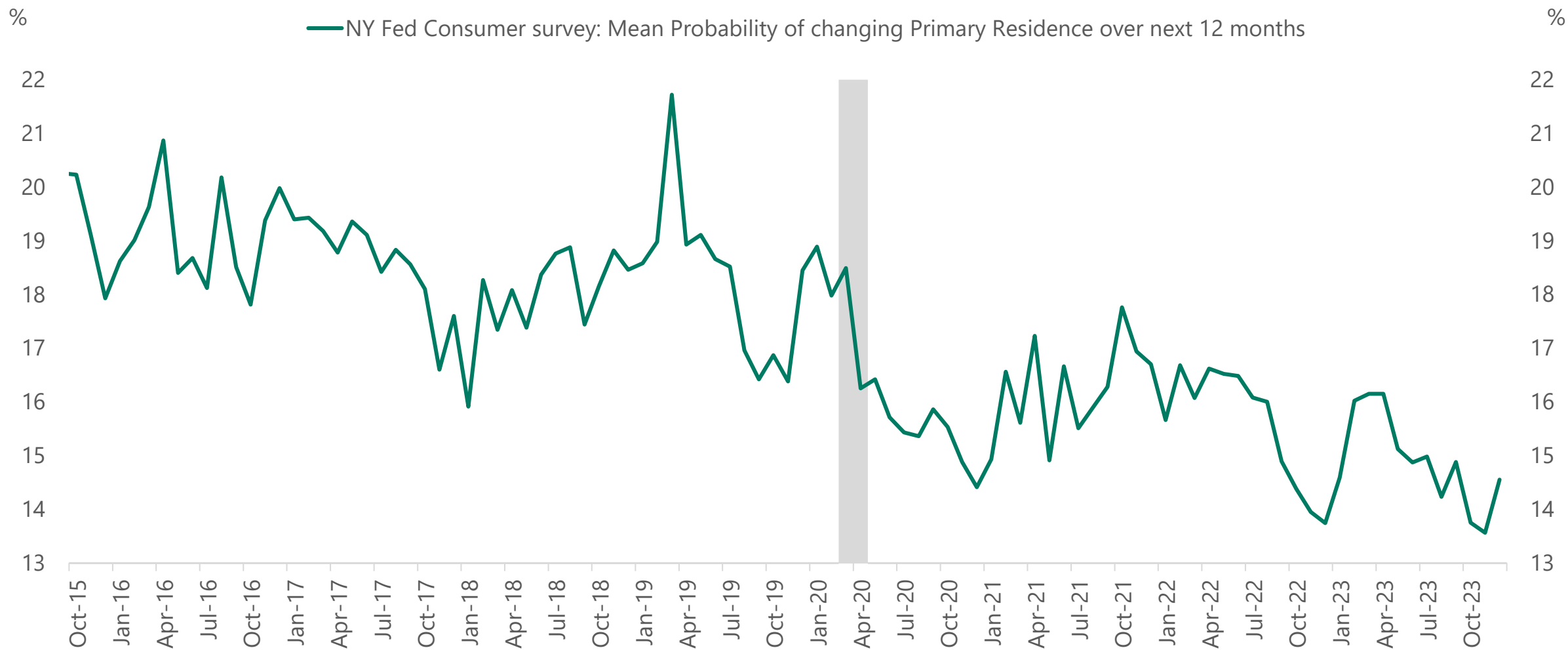
US has an estimated deficit of 2.5mn homes

Household formation

— Household formation — Trend

Household formation vs trend

Surplus

Deficit

Source: Census, Haver Analytics, Apollo Chief Economist
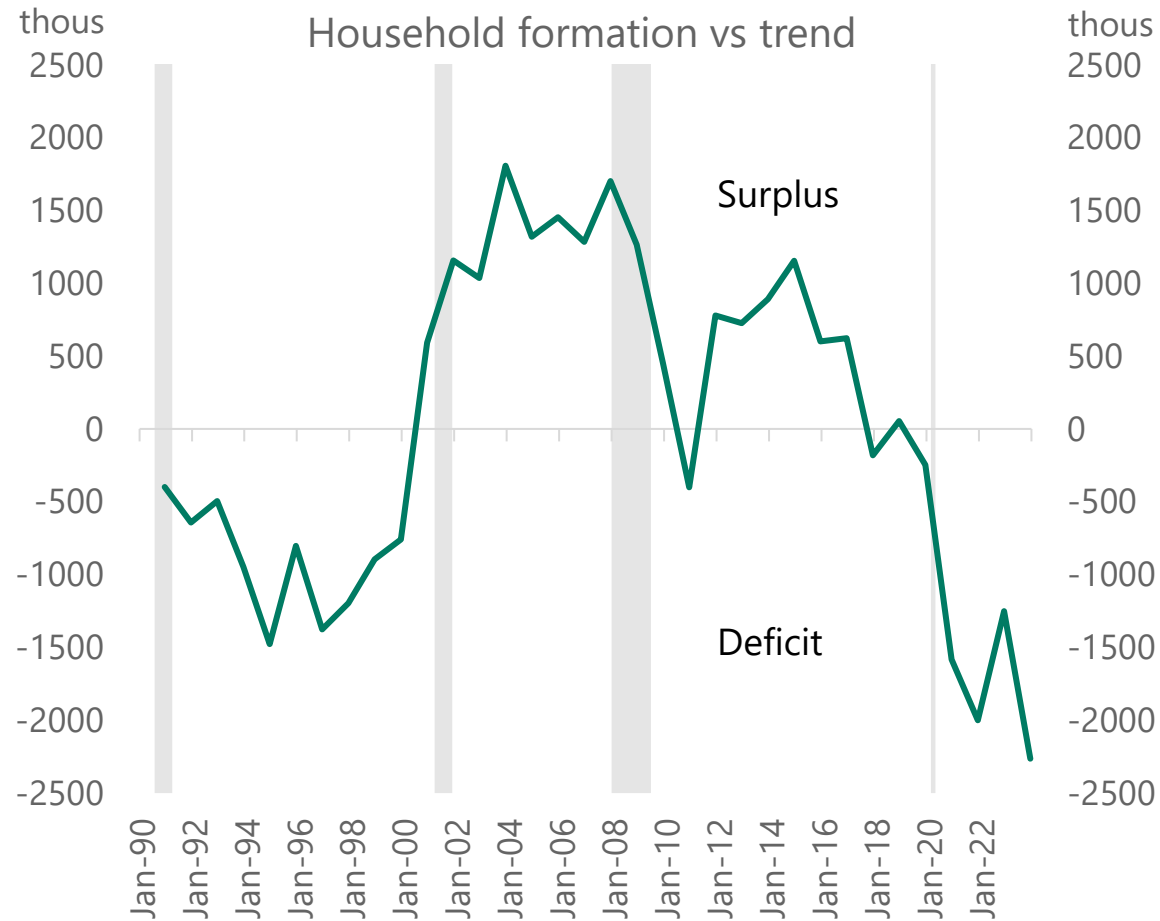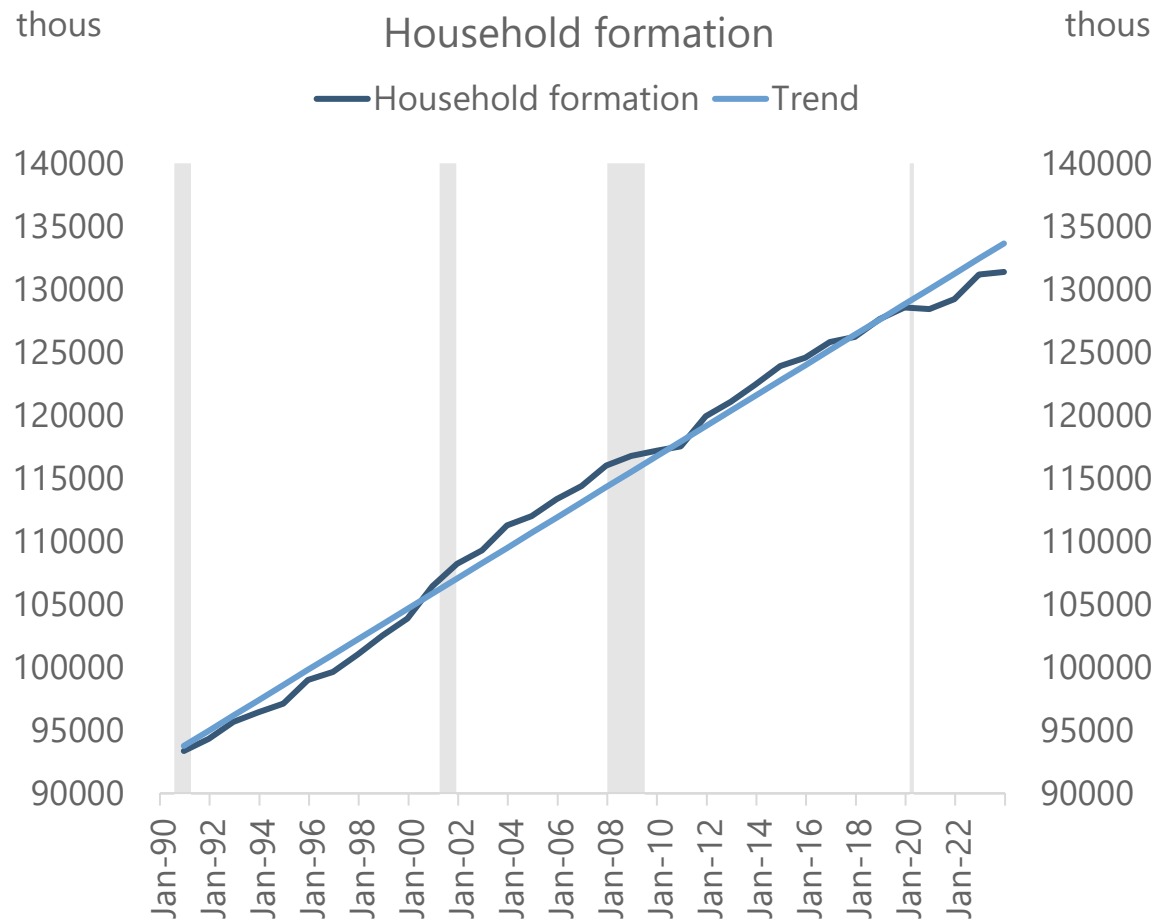
New versus existing homes

House prices for new homes and existing homes

Median Sales Price: Total Existing Homes Median Sales Price: New 1-Family Houses
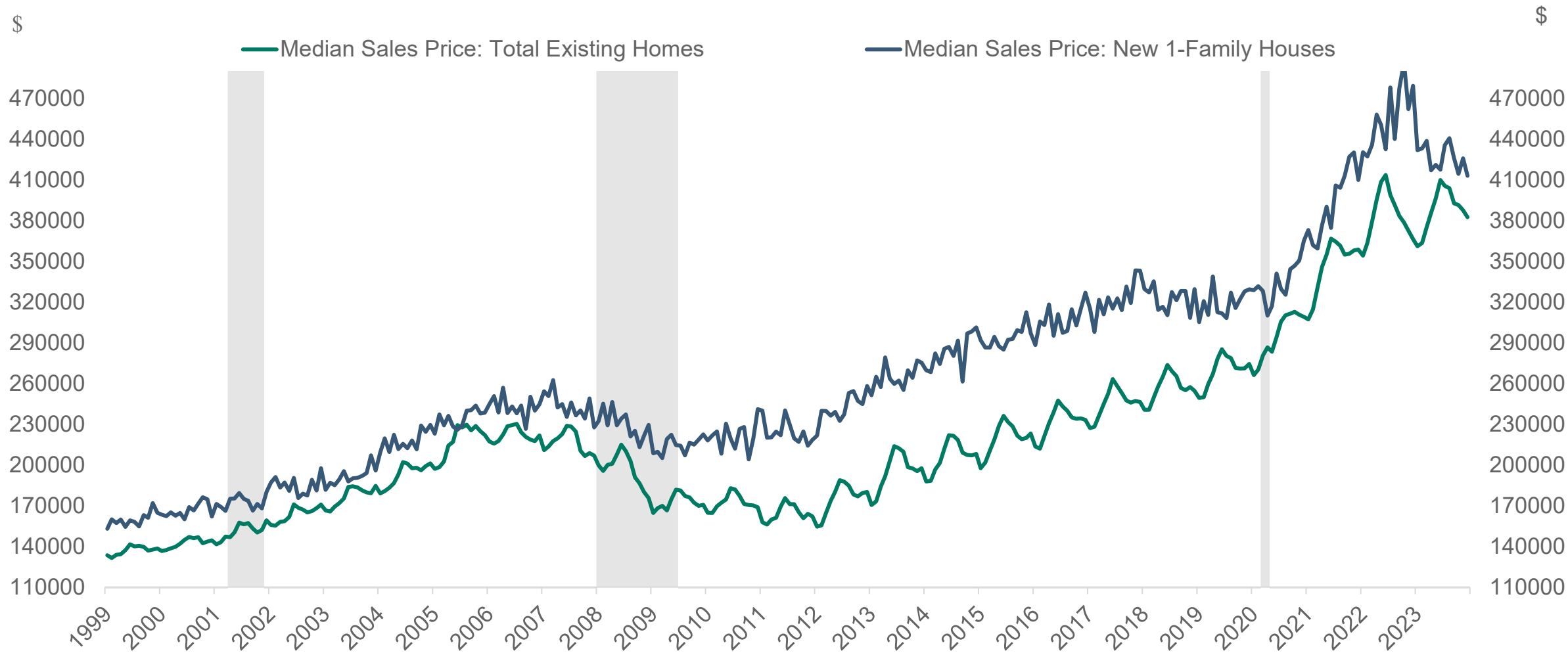
New privately owned housing units under construction starting to peak

New Privately Owned Housing Units Under Construction
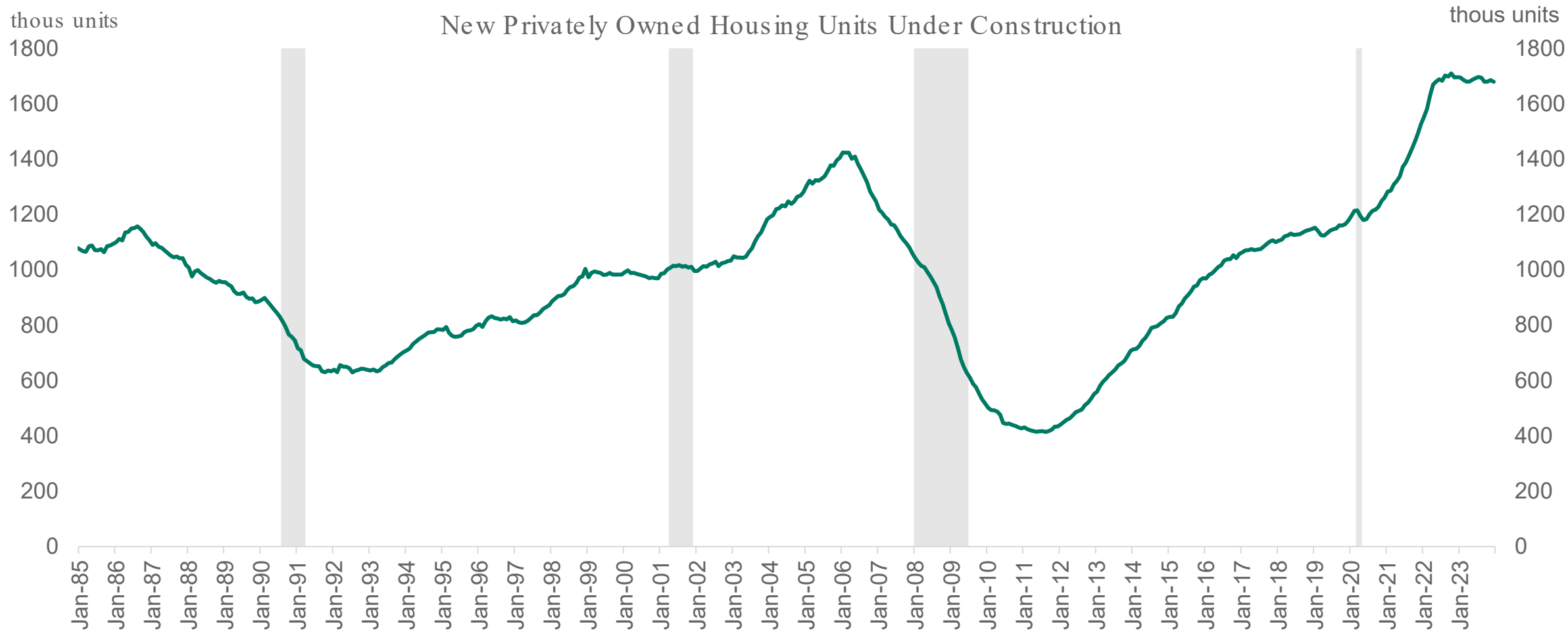
Source: Census Bureau, Haver Analytics, Apollo Chief Economist

Consensus is forecasting a modest rebound in home sales

SAAR, thous.
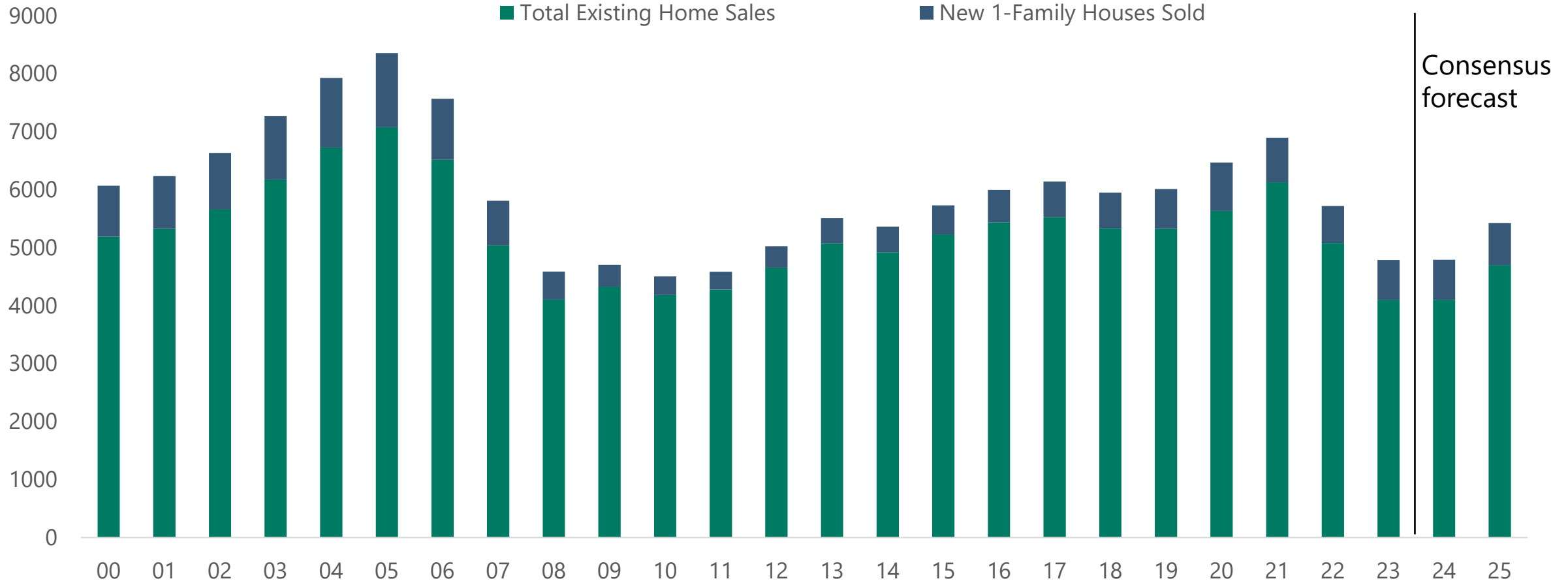
Legend: ■ Total Existing Home Sales ■ New 1-Family Houses Sold

Consensus forecast

35

Our US house price model

US house price model: Declining mortgage rates pushing home prices higher. Low inventory pushing home prices higher.

%YoY

S&P CoreLogic Case-Shiller US Home Price Index

US home price (%YoY,t) = 25.49 - 3*mortgage rates(12 m change,t-12) -5.2*Existing home sales inventory(t) - 1.6*Unemployment rate (t)

8.2%

Source: Bloomberg, Apollo Chief Economist

37
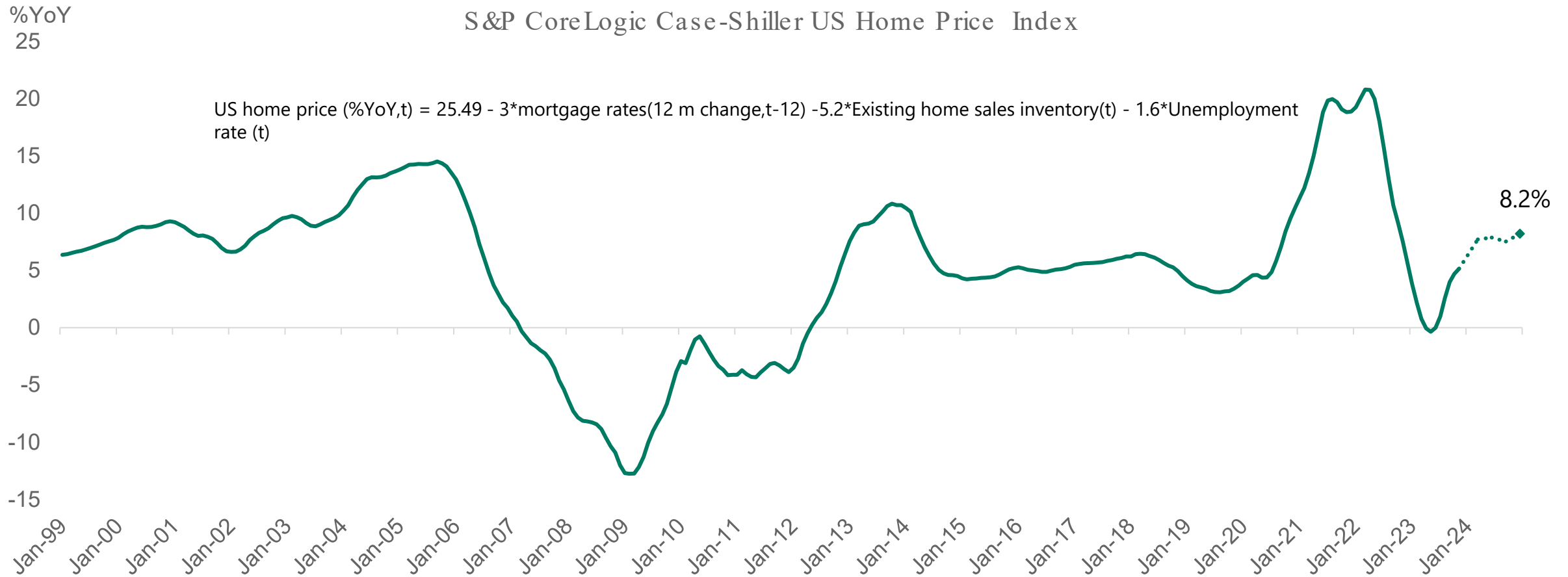
1) Housing Demand: Higher mortgage rates and high home prices slowing demand

Home buying plans declined amid high mortgage rates

% Respondents

% Respondents

— Plans to Buy Within 6 Months: Home, Yes (% Respondents; SA)(ls)
— Plans to Buy Within 6 Months: Home, New (% Respondents; SA)(rs)
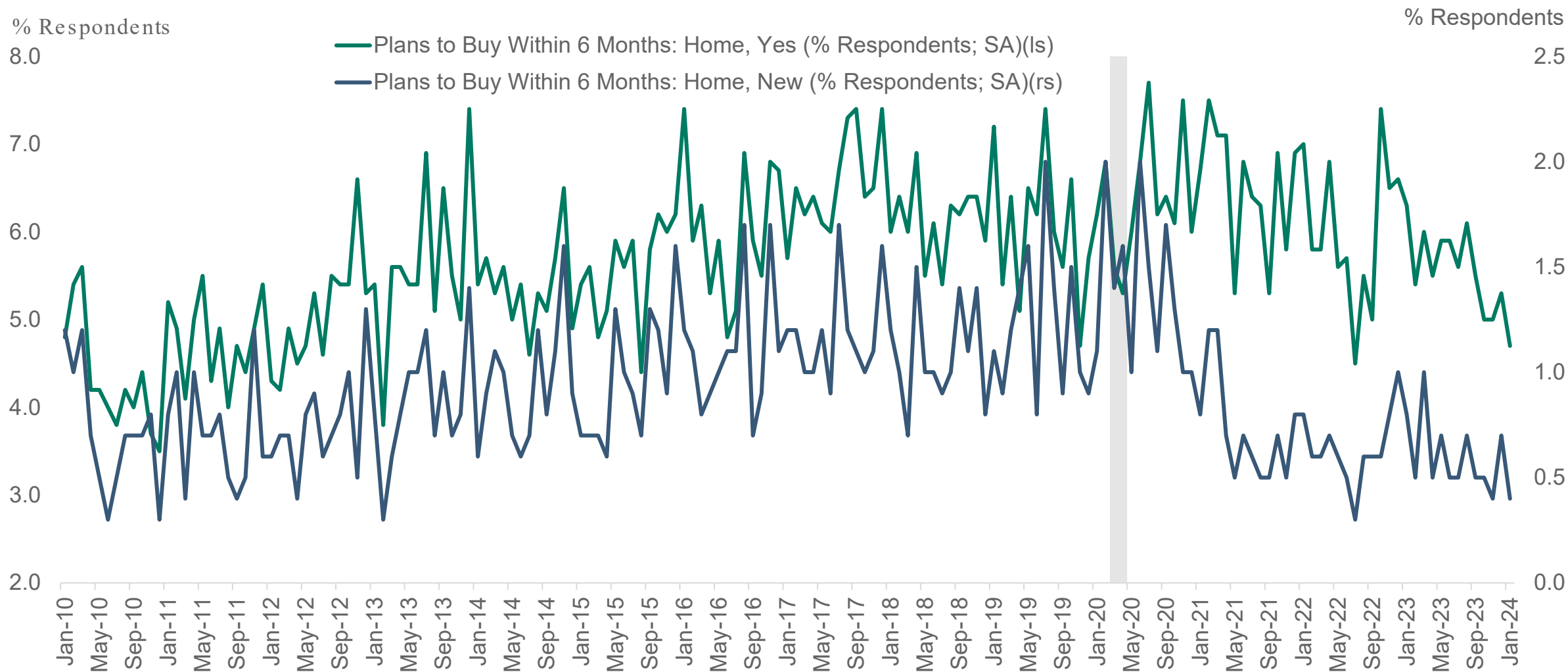
Monthly mortgage payments on new mortgages have doubled since 2021

NAR Housing Affordability: Monthly Principal & Interest Payment

Source: NAR, Haver Analytics, Apollo Chief Economist
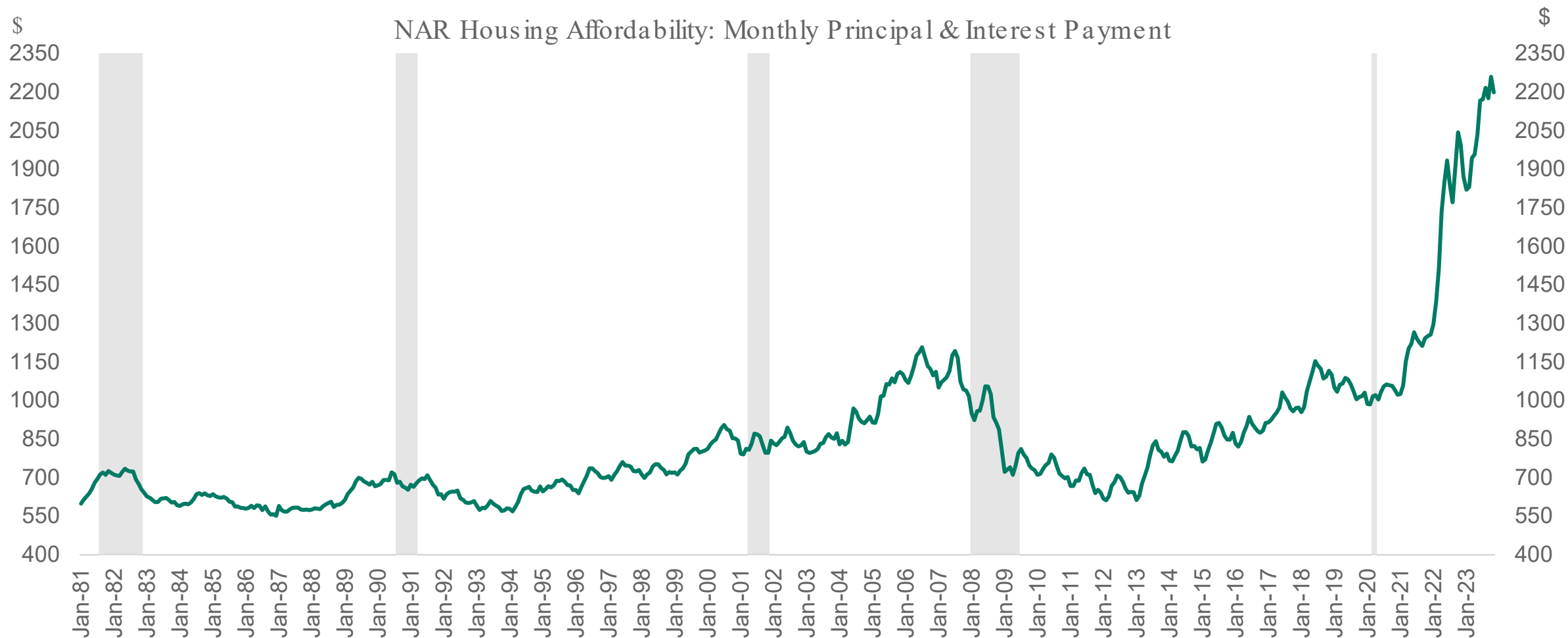
Availability of mortgage credit at tight levels
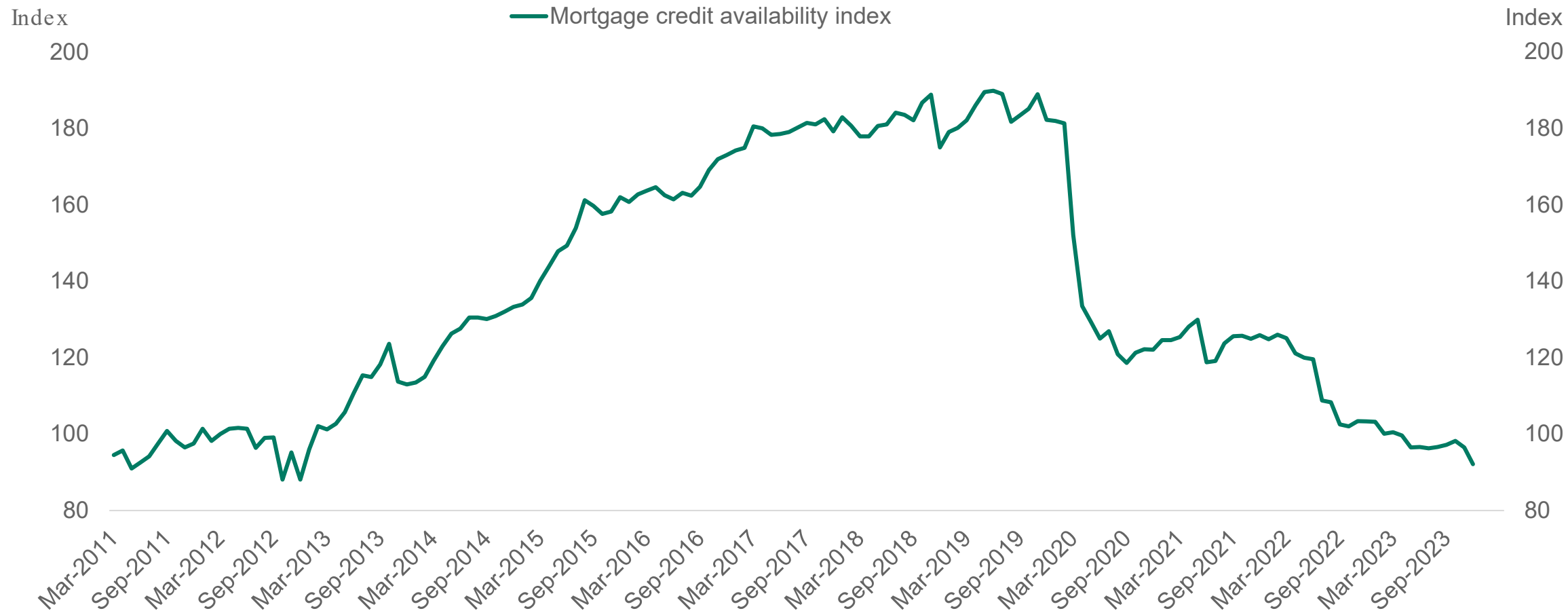
Mortgage originations back at pre-pandemic levels

Mortgage originations by age

Legend: 18-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70+
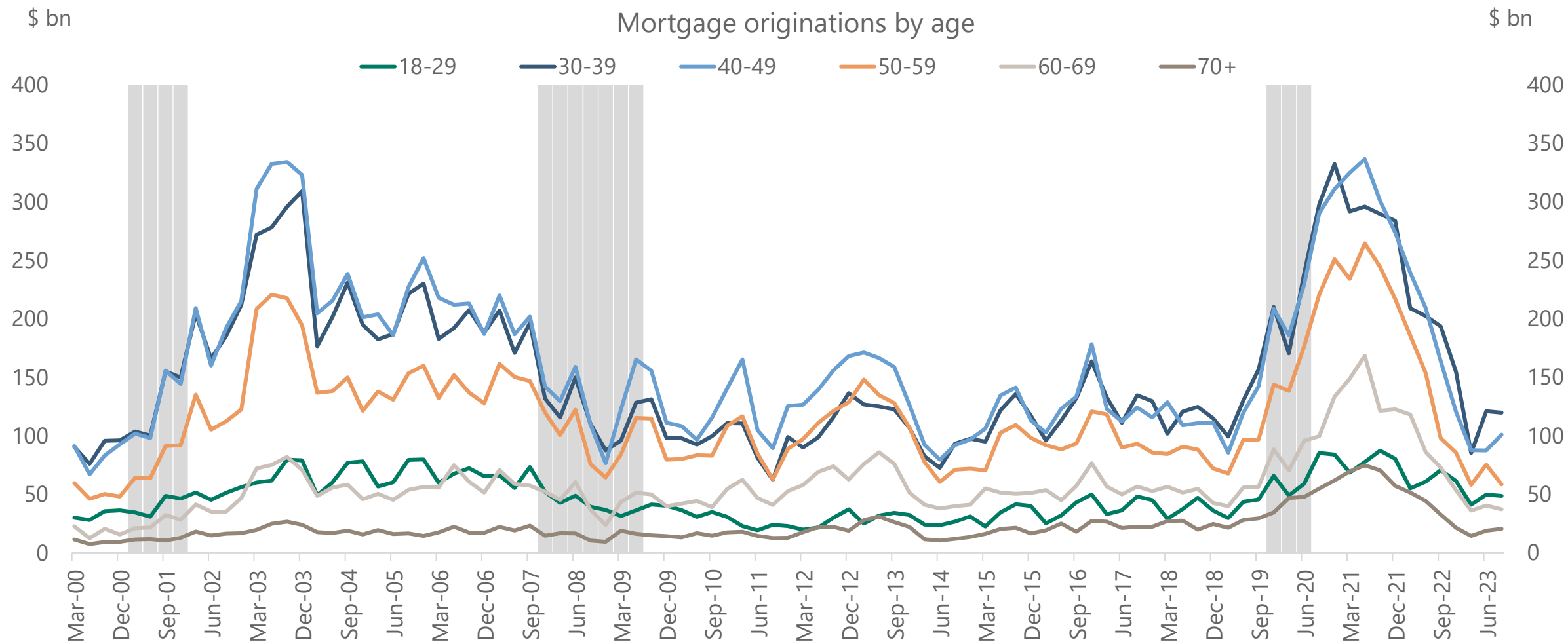
Source: NY Fed, Bloomberg, Apollo Chief Economist

42

Mortgage originations normalizing for households with high credit scores

Mortgage originations by score

— < 620 — 620-659 — 660-719 — 720-759 — > 760

Demographics are a tailwind to housing demand

Mns

US population by age, June-2023

Many first-time homebuyers/31-year olds

Age
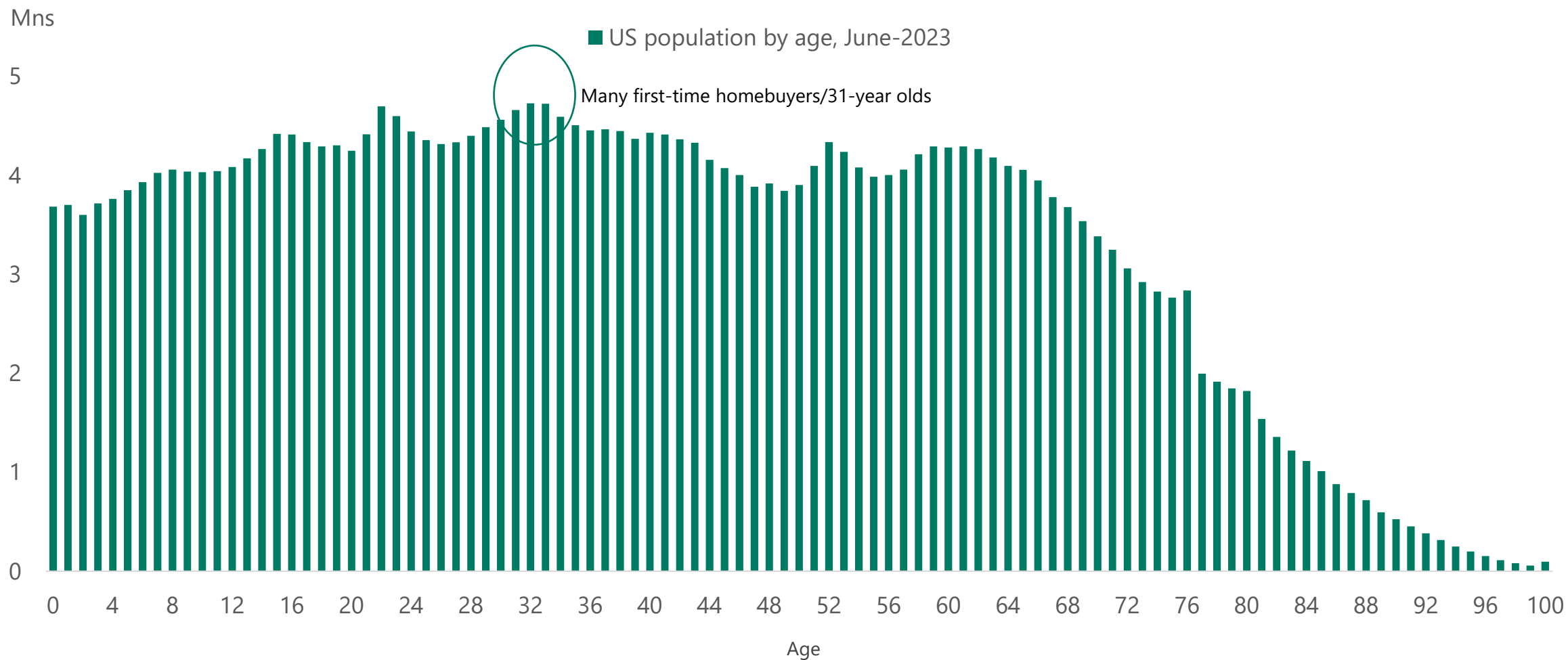
Rebounding household formation is a tailwind to housing

Thousands of units

Source: Census Bureau, Haver, Apollo Chief Economist
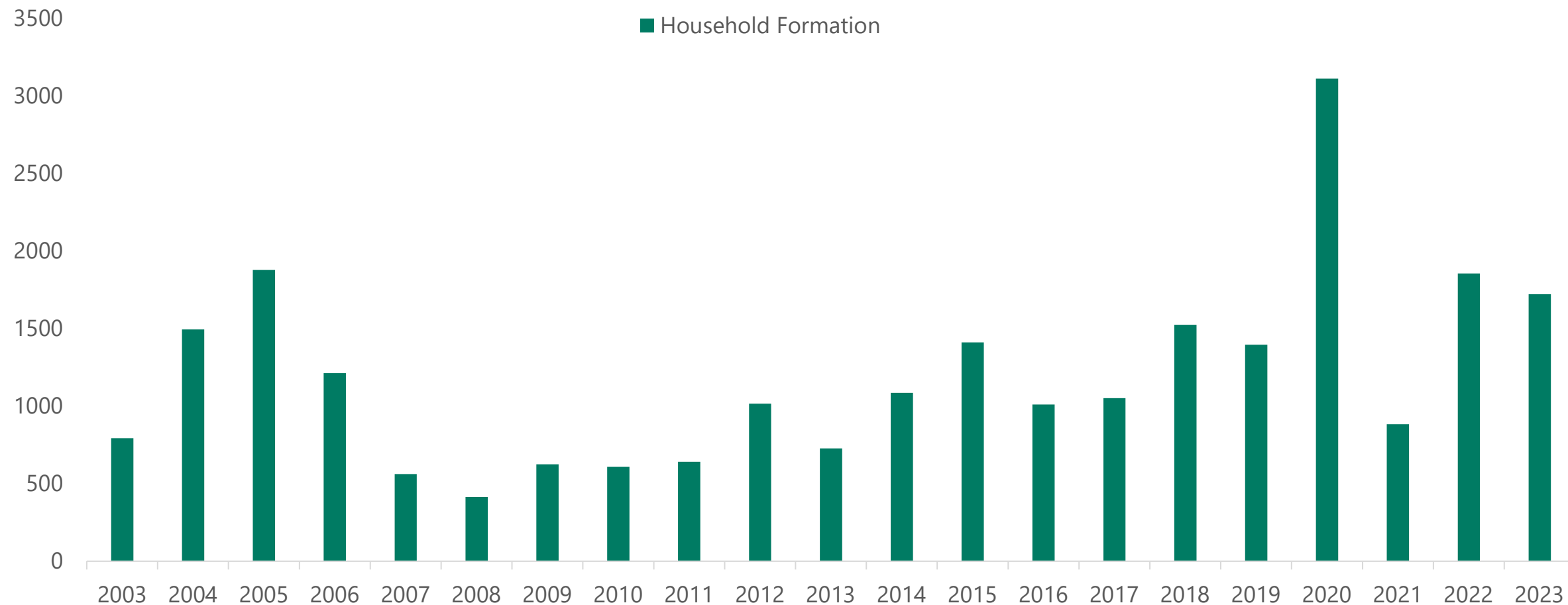
Decline in the number of renters recently

US: household formations by type

2 yr avg change (left and right axes)

Legend: Total, Renter occupied, Owner occupied

46
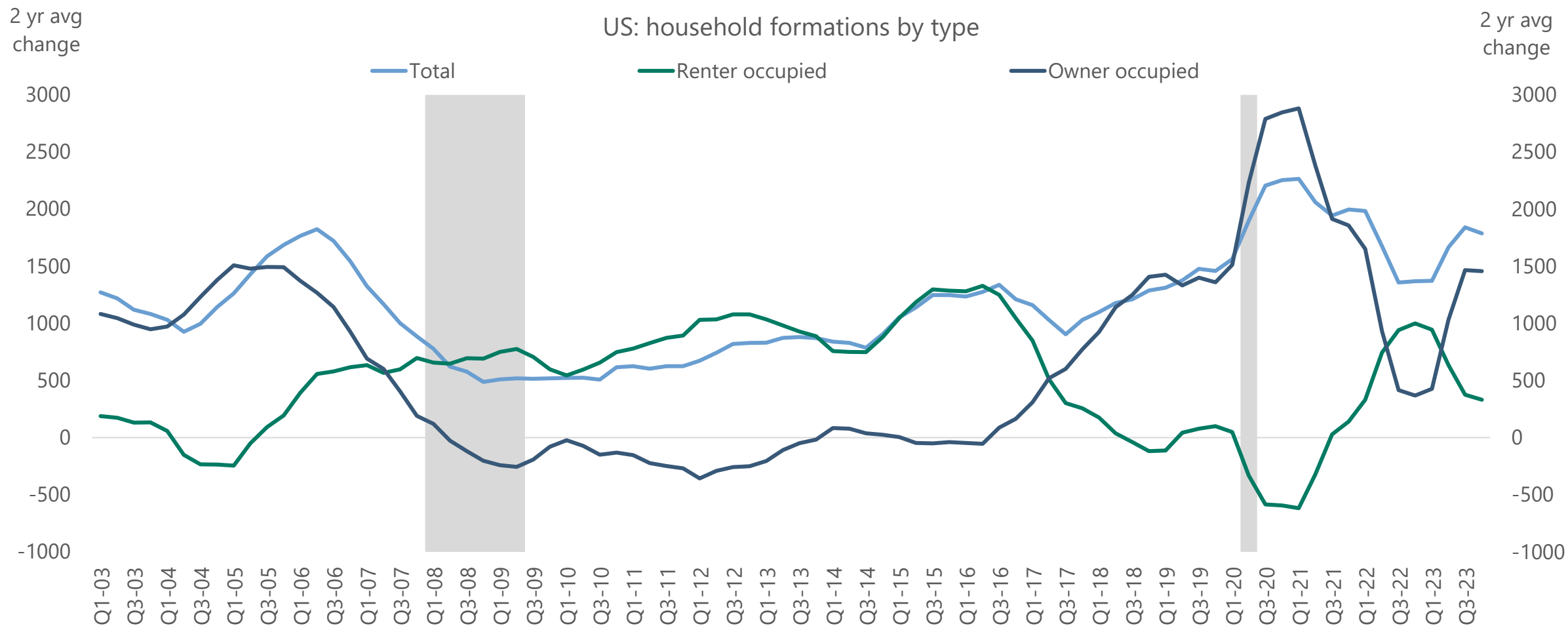
Homeownership rate moving sideways

Source: Bloomberg, Apollo Chief Economist
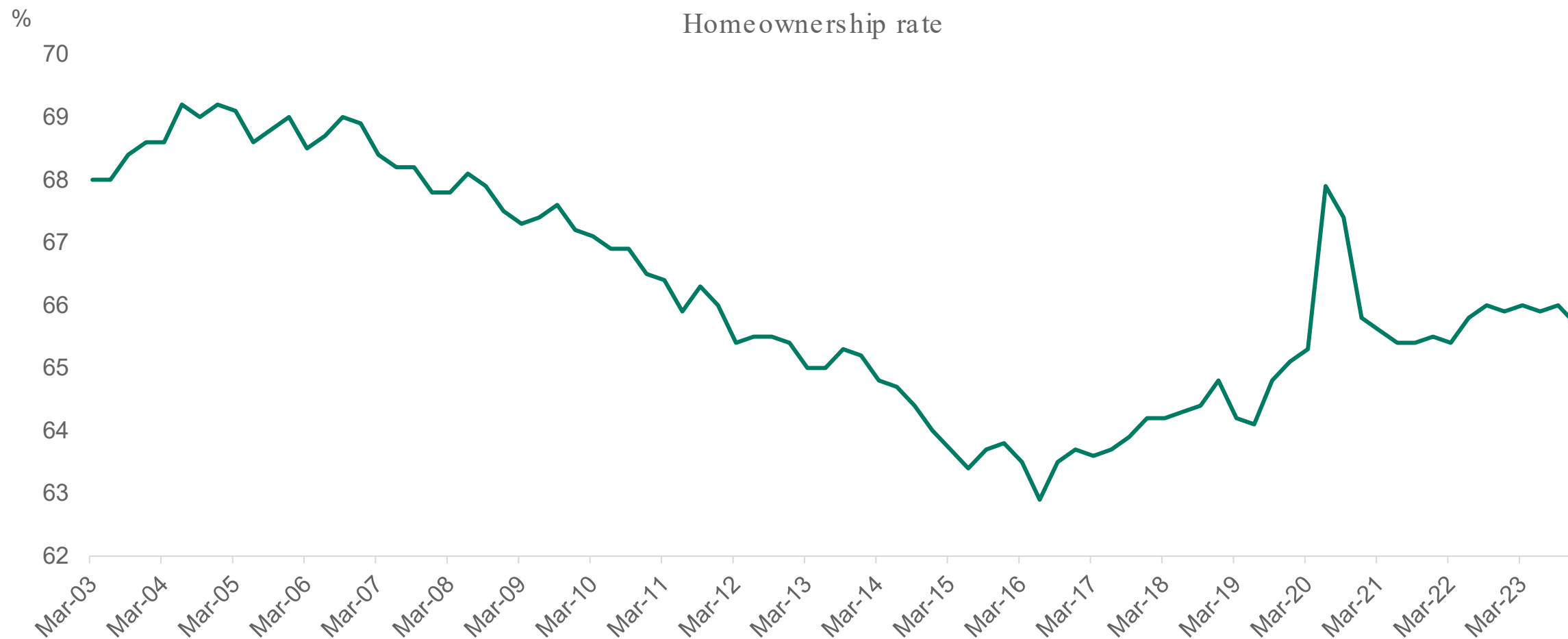
Low unemployment is a tailwind to housing demand

Source: BLS, Haver Analytics, Apollo Chief Economist

Very few delinquent mortgages

Delinquency as a % of all mortgages
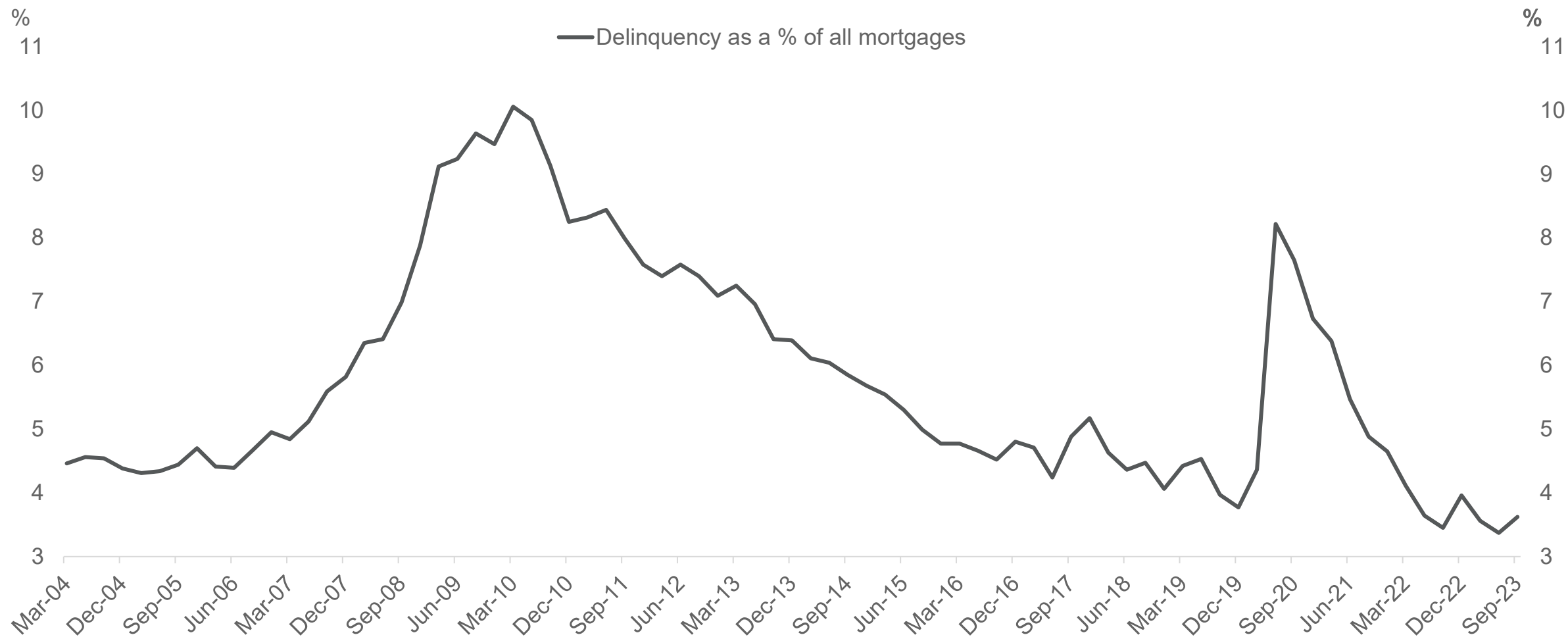
First time homebuyers are feeling pinch of high interest rates
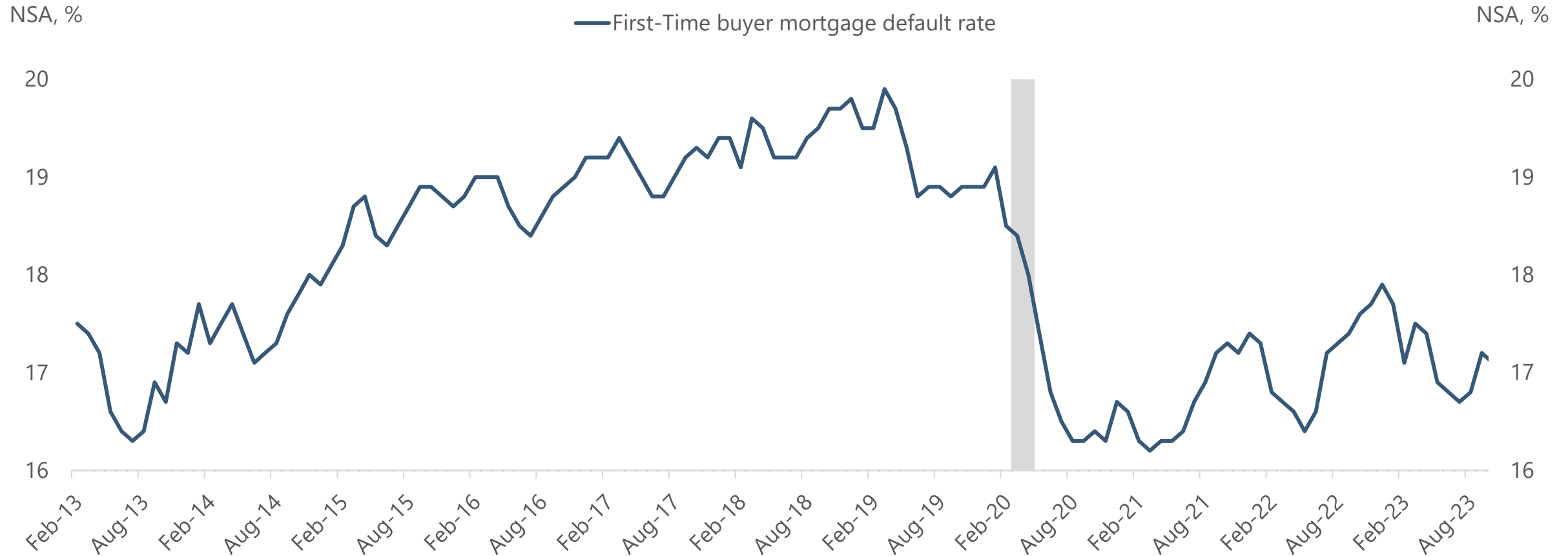
NSA, %

NSA, %

—First-Time buyer mortgage default rate

Investor share of single-family has trended lower as mortgage rates have increased
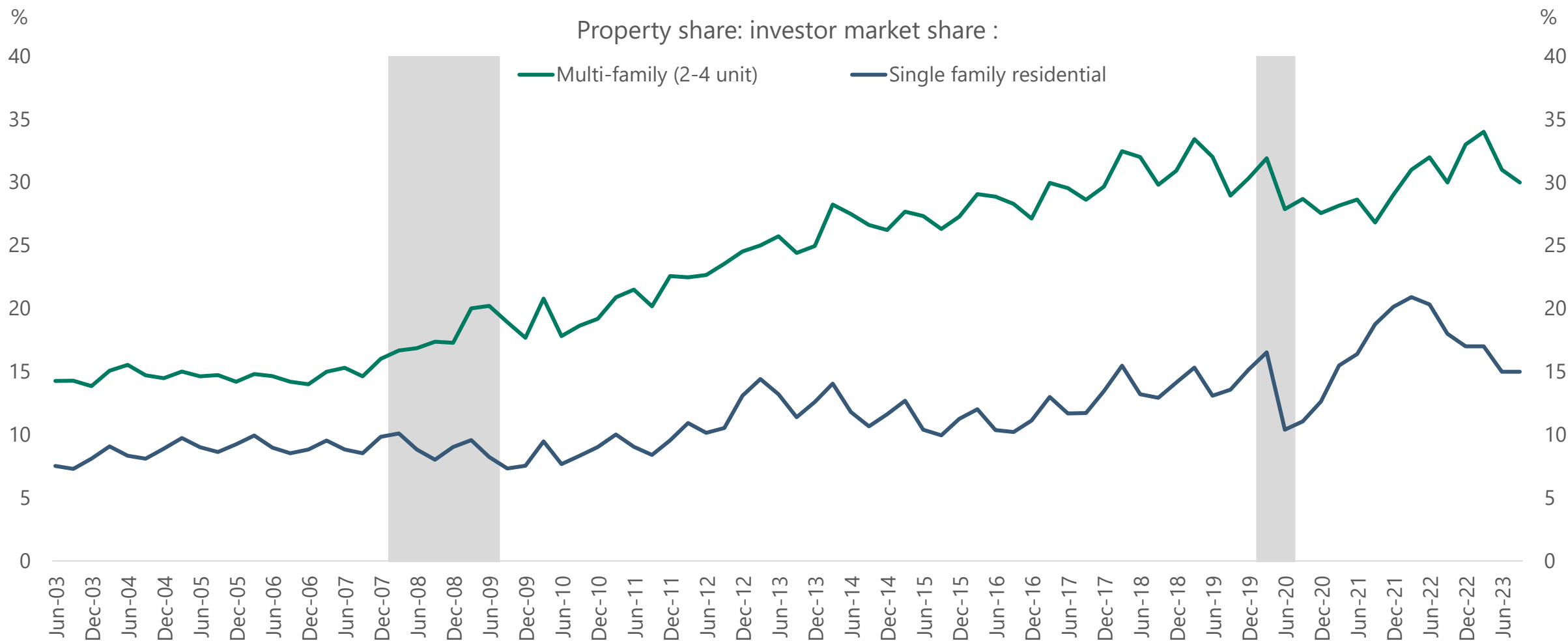
Source: Redfin, Apollo Chief Economist (Definition of Investor market share: the percentage of total home sales in which an investor was the buyer)

Migration out of California and migration into Florida during the pandemic

Thousands
of residents

States by net domestic & international migration (April 1, 2020 - July 1, 2023)

■ Net domestic migration   ■ Net international migration

Source: Census Bureau, Apollo Chief Economist
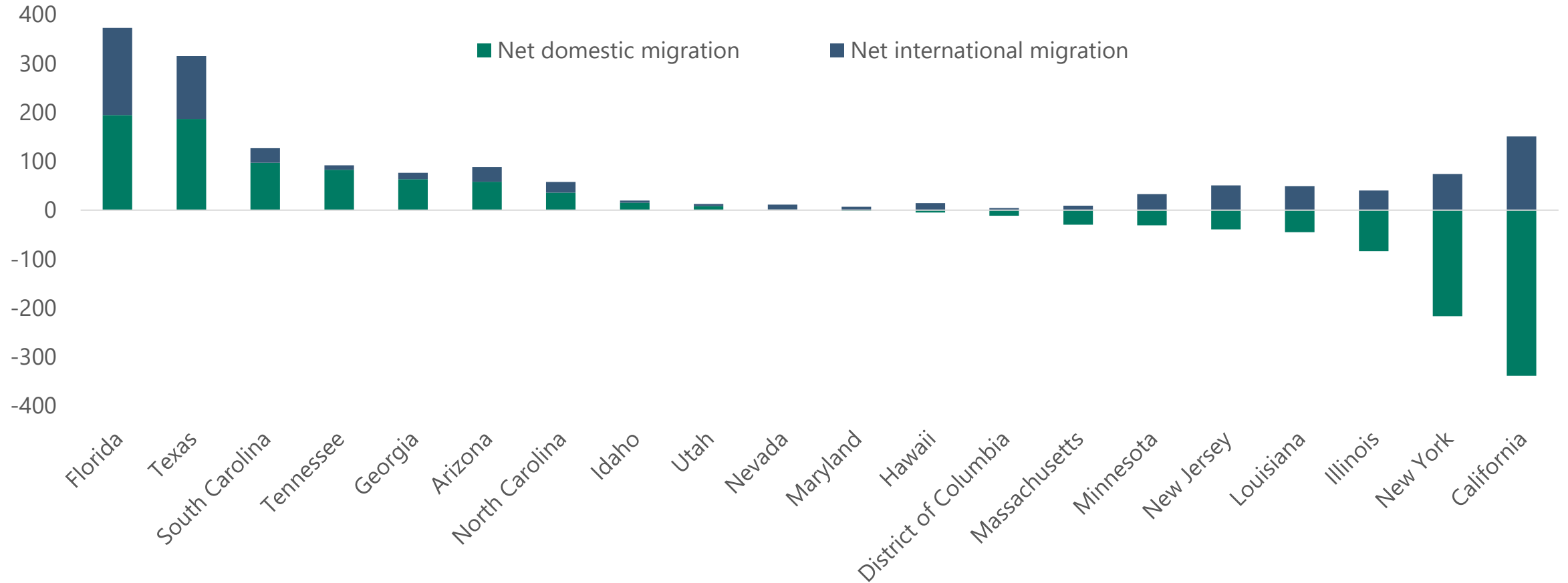
Share of mortgages outstanding by interest rate

Share of mortgages outstanding by interest rate at origination by count, 2023 Q3

- Below 3%
- 3 to 4%
- 4 to 5%
- 5 to 6%
- Above 6%

Despite high mortgage rates, 31% of homes sold above their list price
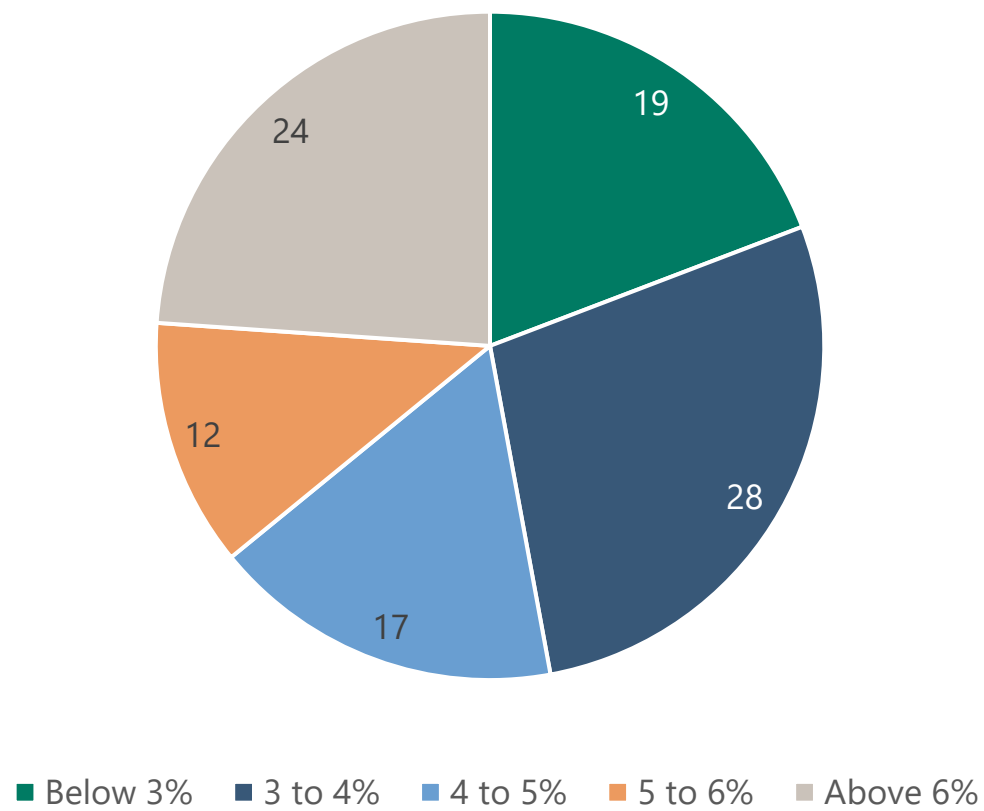
Housing affordability near record lows

Housing affordibility index

Homebuyer sentiment

Current Conditions for Buying Houses: Bad: High Prices
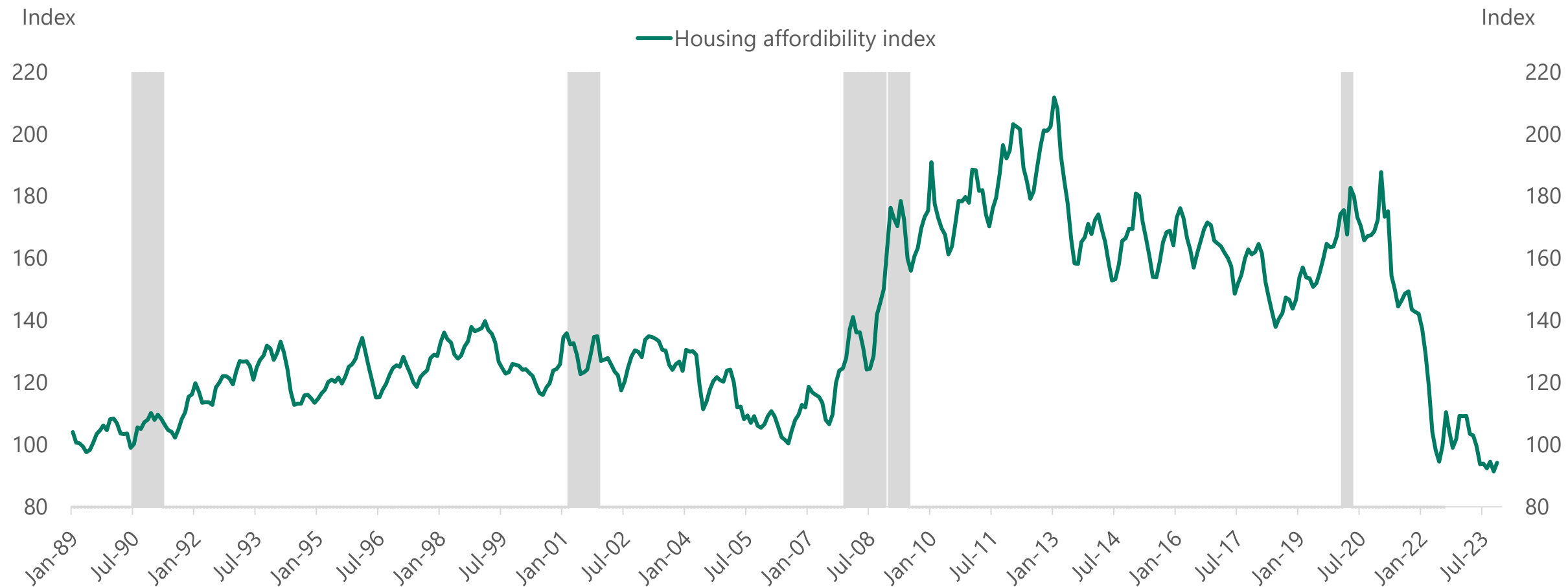
Source: University of Michigan, Apollo Chief Economist
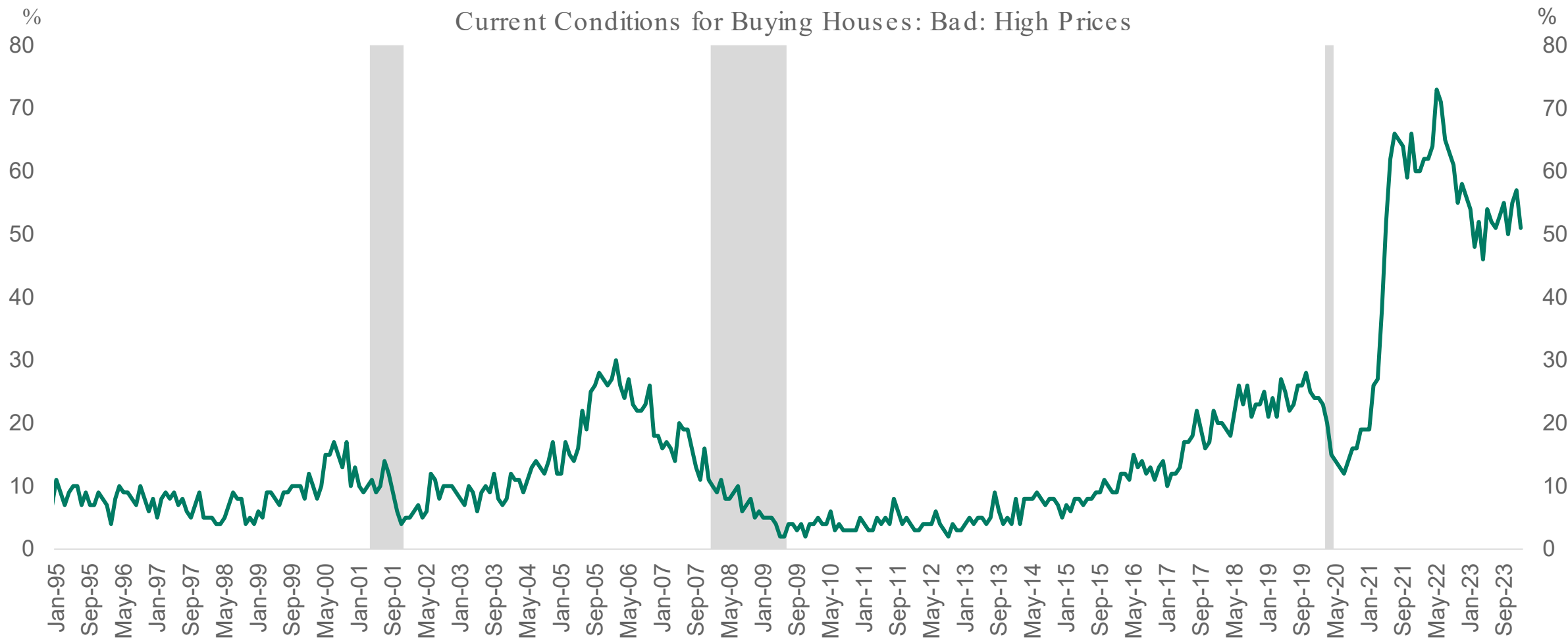
63% of consumers are saying that this is a bad time to buy a house because of high mortgage rates and tight credit

Current Conditions for Buying Houses: Bad: High Interest/Tight Credit

Source: University of Michigan, Apollo Chief Economist
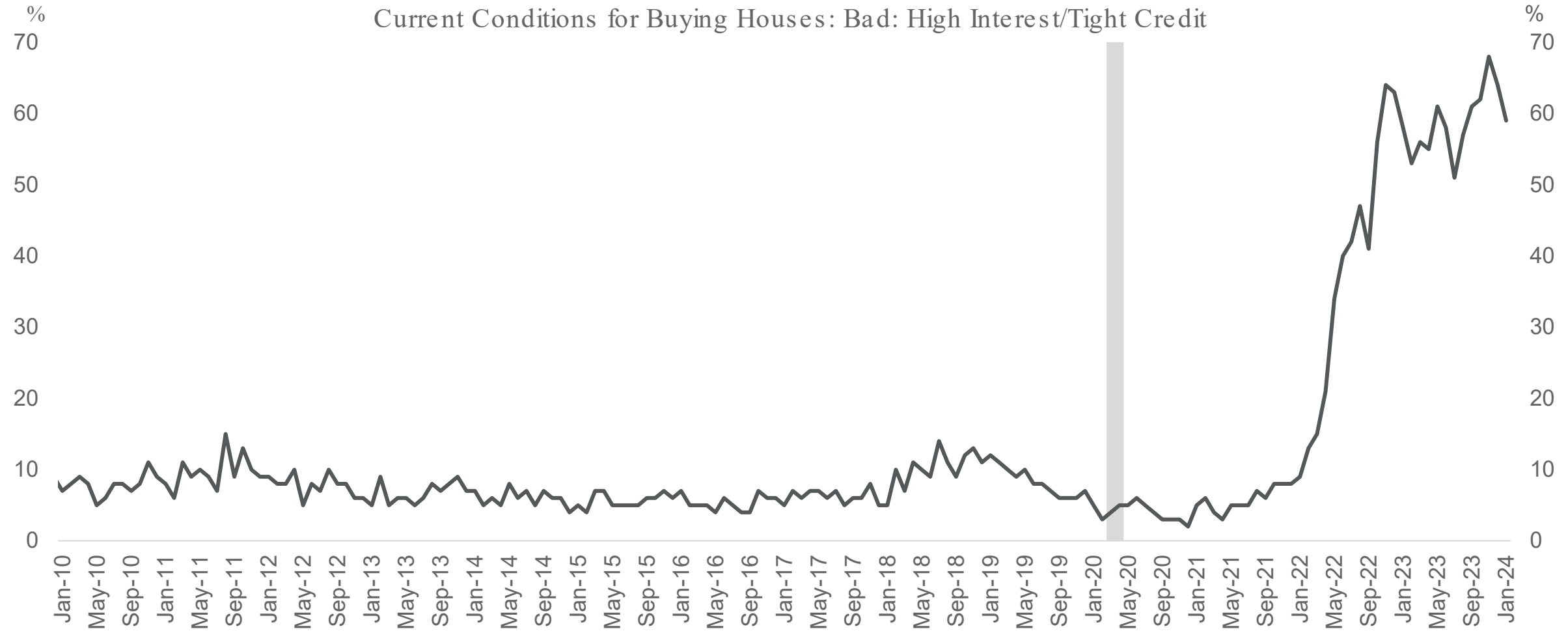
2) Housing Supply: Housing supply is low,
construction coming down from record-high levels

Listings starting to rise

Weekly active listings
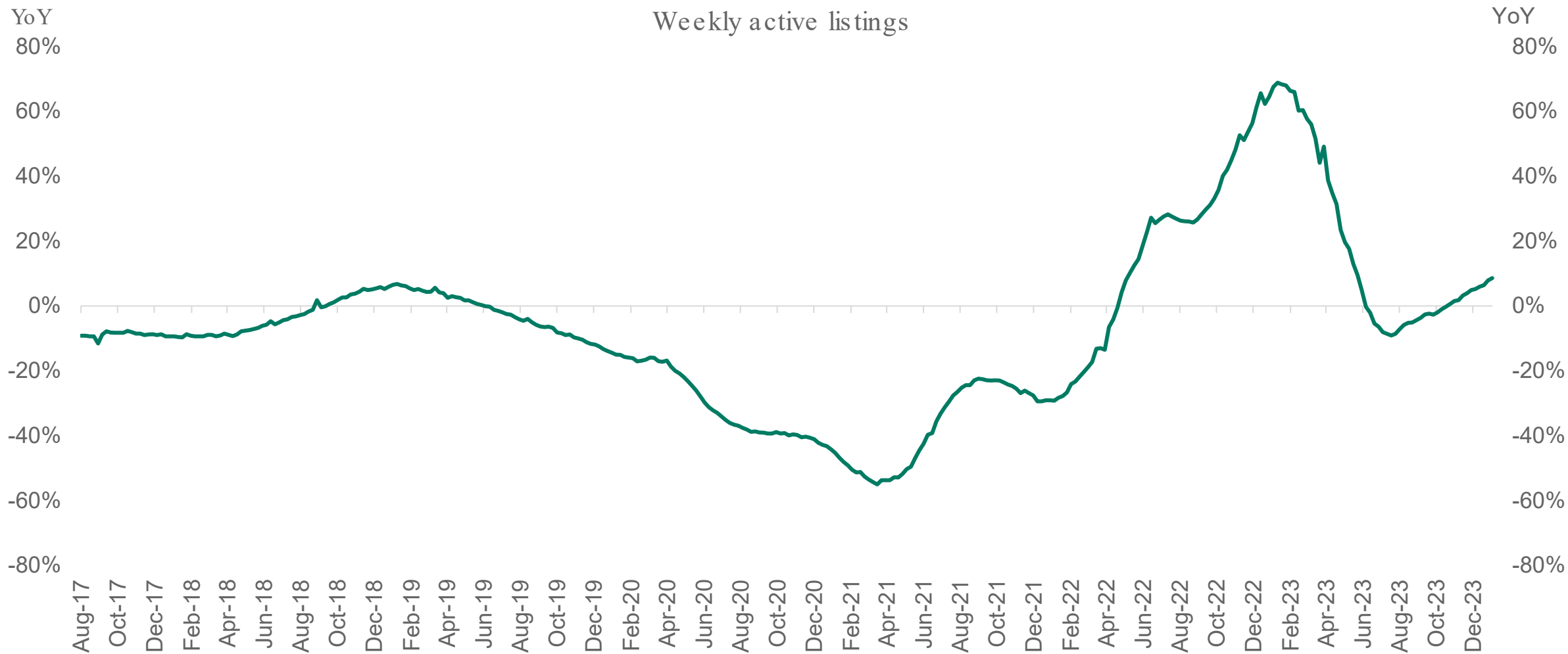
Homeowner and rental vacancy rates at very low levels

Source: Census Bureau, Haver, Apollo Chief Economist
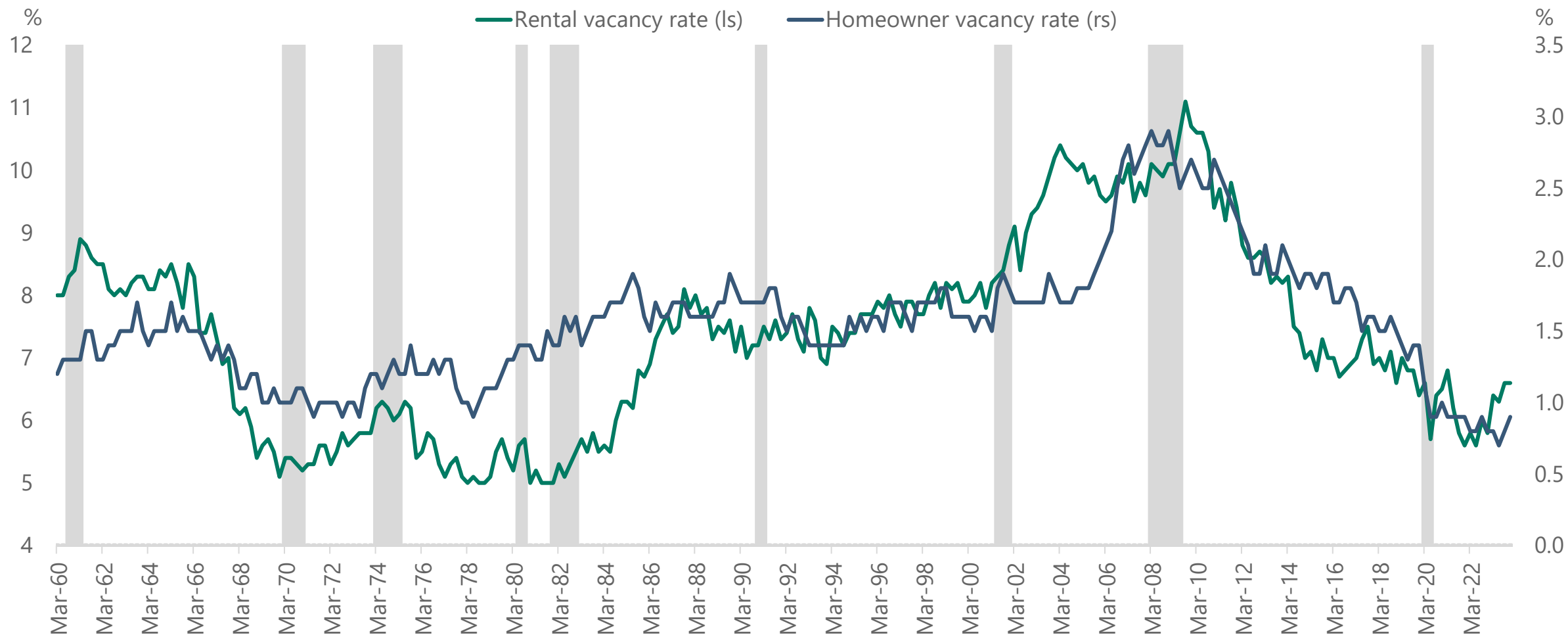
Residential construction spending starting to rise again

US Private construction spending

Source: Census, Apollo Chief Economist
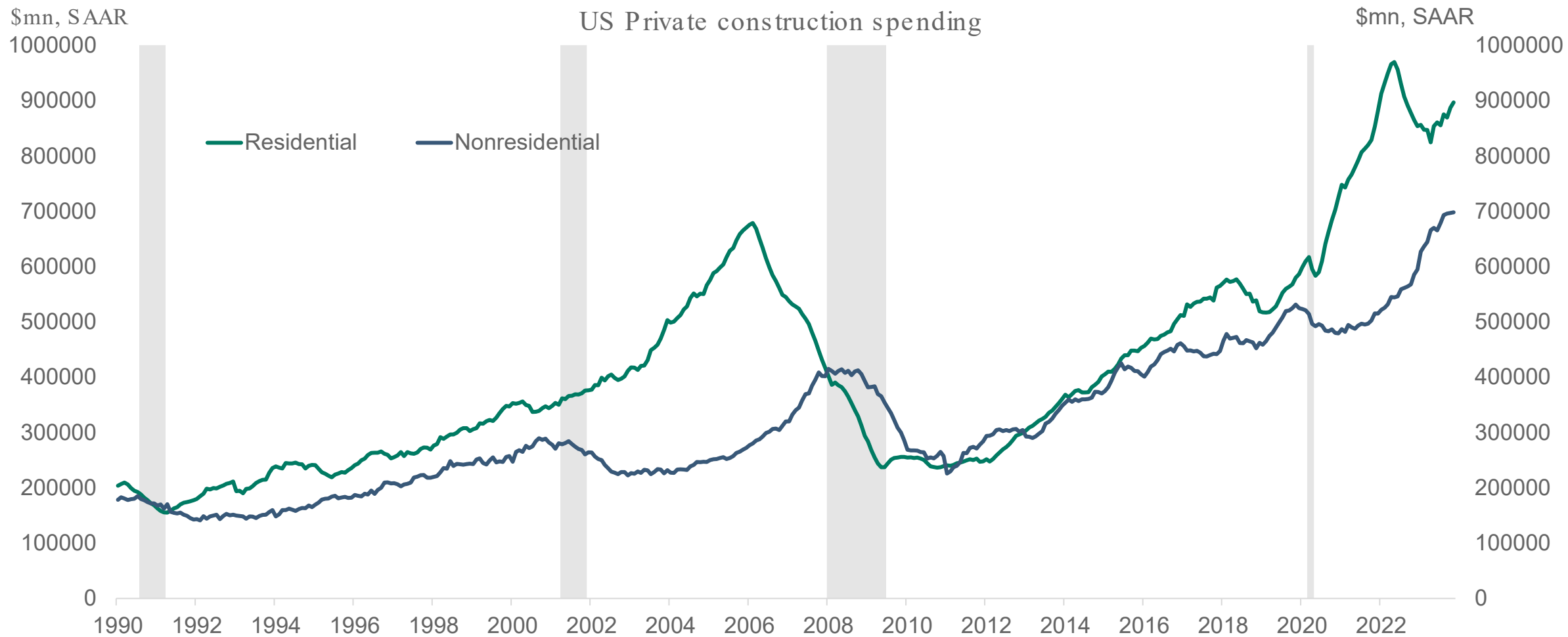
New housing units authorized but not started

Source: FRED, Apollo Chief Economist
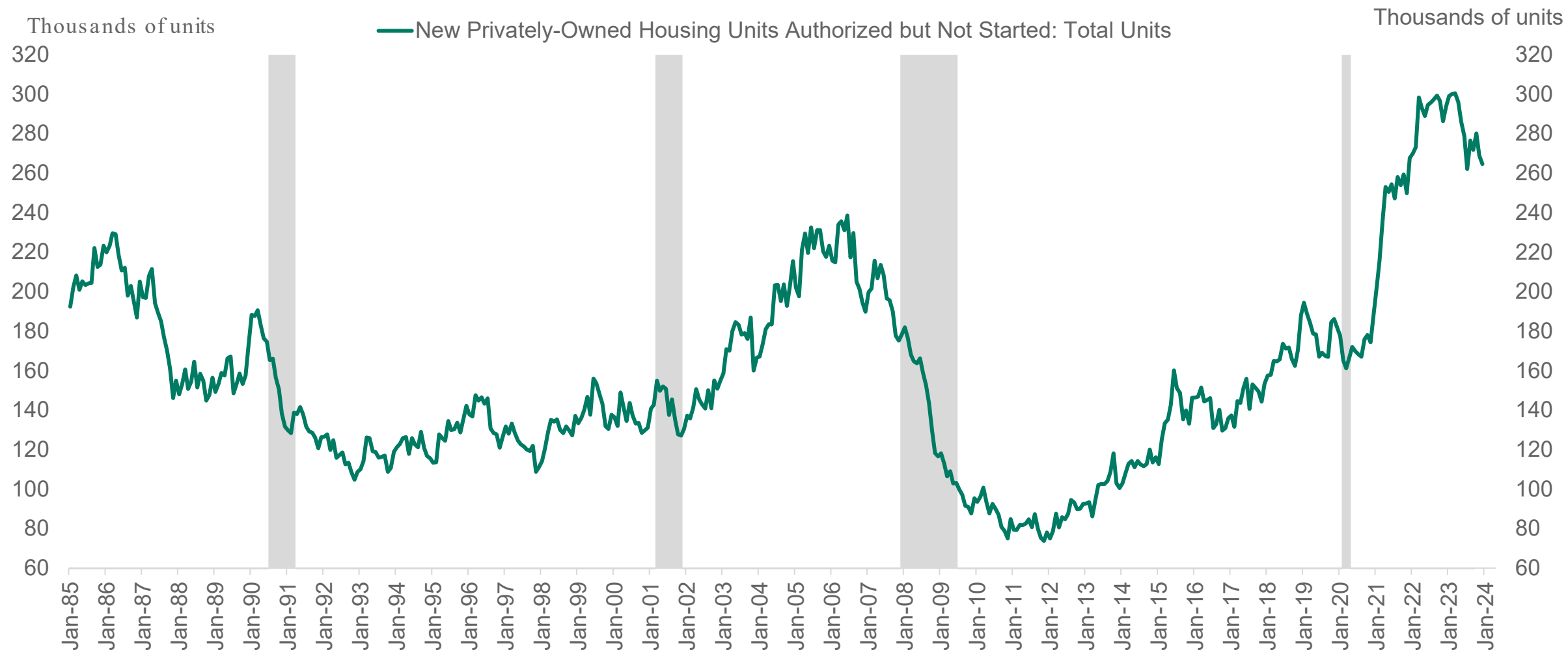
The biggest increase in non-residential construction has been in manufacturing

Private non-residential construction spending

Feb 2020=100

Legend:
- Lodging
- Health Care
- Transportation
- Manufacturing
- Office
- Education
- Communication
- Commercial
- Amusement & Recreation
- Power

Source: Census, Haver Analytics, Apollo Chief Economist

63
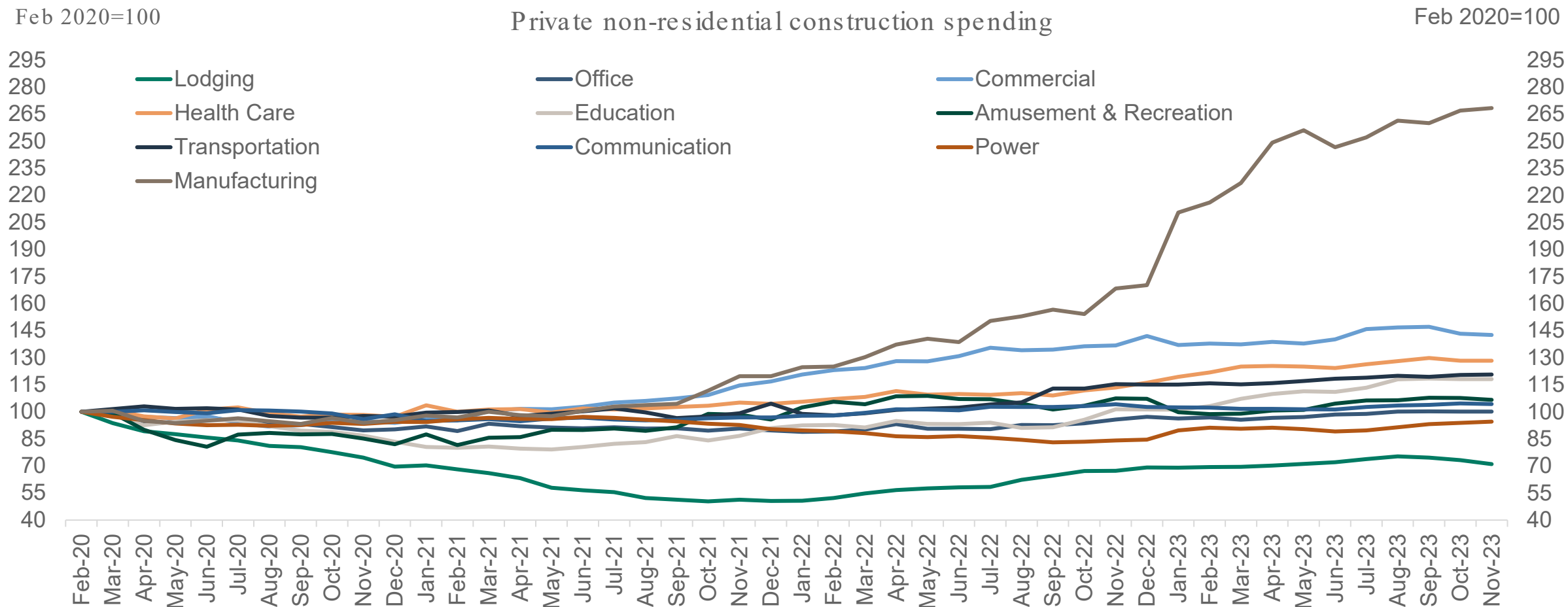
Newly listed homes very low

US new listings

thous units

2018 2019 2020 2021 2022 2023

Source: Realtor.com. Apollo Chief Economist
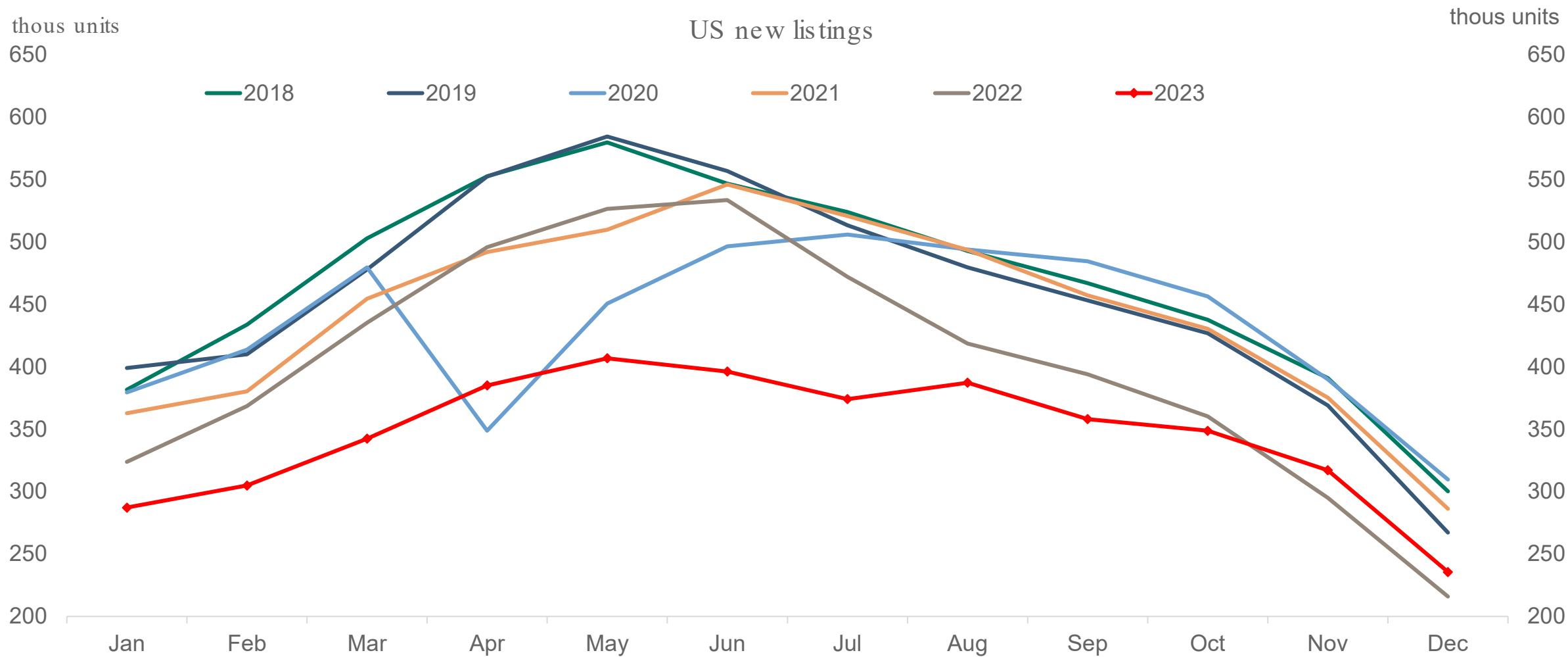
Vacant housing units held off market coming down

Total Vacant Housing Units: Held Off Market

thous

8000
7500
7000
6500
6000
5500
5000
4500
4000

Mar-90, Feb-91, Jan-92, Dec-92, Nov-93, Oct-94, Sep-95, Aug-96, Jul-97, Jun-98, May-99, Apr-00, Mar-01, Feb-02, Jan-03, Dec-03, Nov-04, Oct-05, Sep-06, Aug-07, Jul-08, Jun-09, May-10, Apr-11, Mar-12, Feb-13, Jan-14, Dec-14, Nov-15, Oct-16, Sep-17, Aug-18, Jul-19, Jun-20, May-21, Apr-22, Mar-23
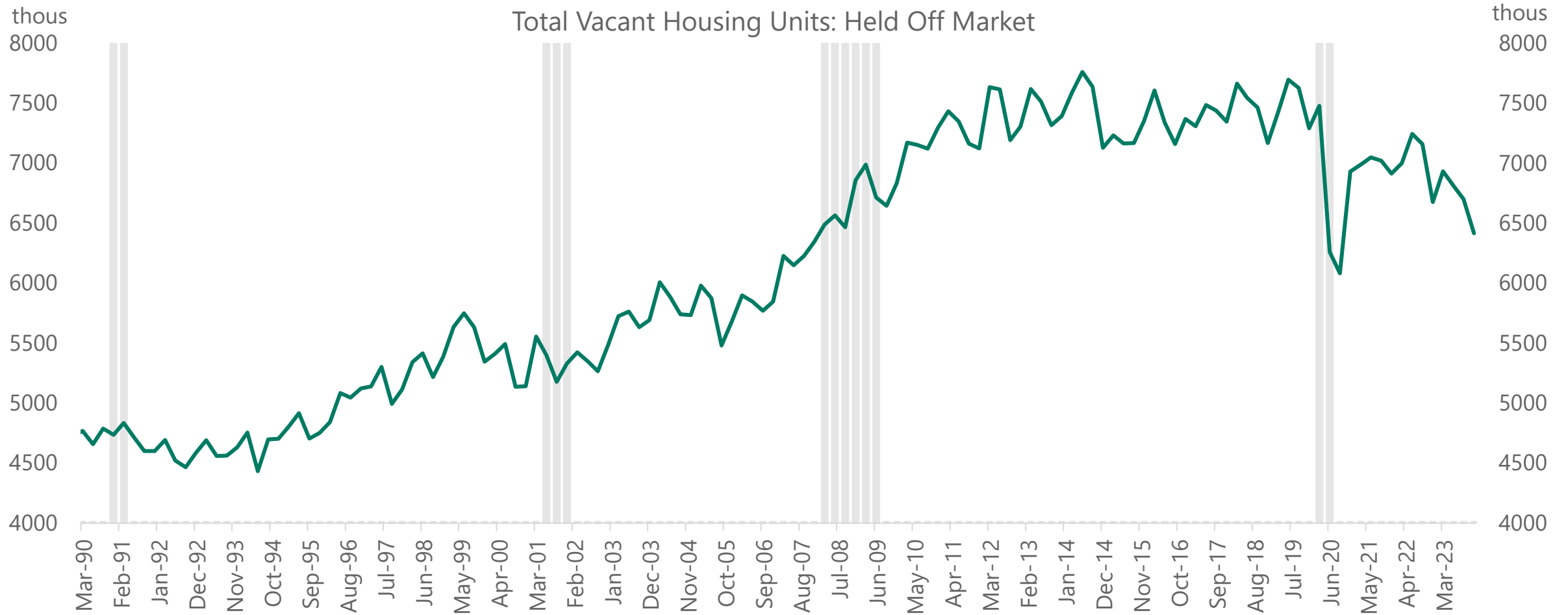
Source: Census Bureau, Haver Analytics, Apollo Chief Economist

Decline in the number of new houses for sale under construction

Thousands of units

Number of new houses for sale

Thousands of units

New single family houses for sale at end of period
Under construction
Not started
Completed units
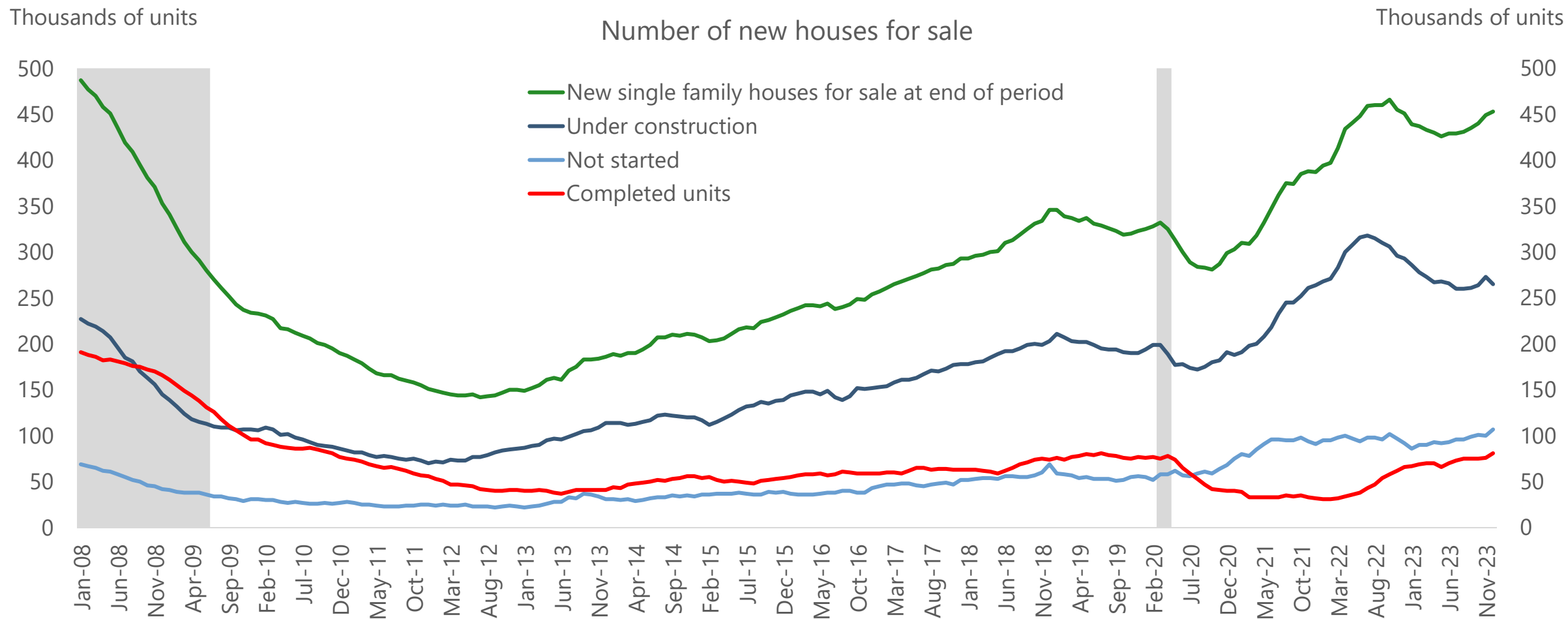
Intent of housing starts

Source: US Census Bureau, Apollo Chief Economist
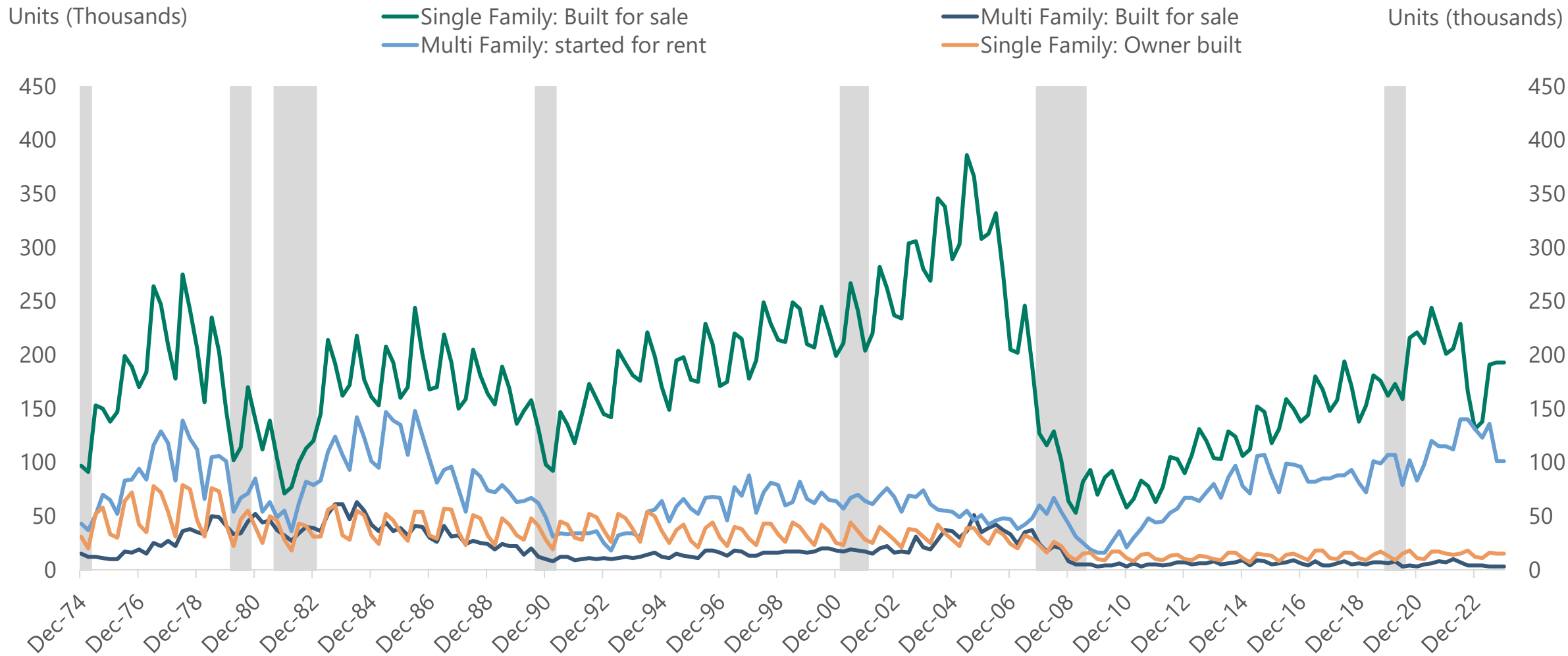
Some disconnect between housing under construction and new homes sold

thous

thous

— Single family housing under construction (ls)
— New one family houses sold (SAAR) (8m lead) (rs)
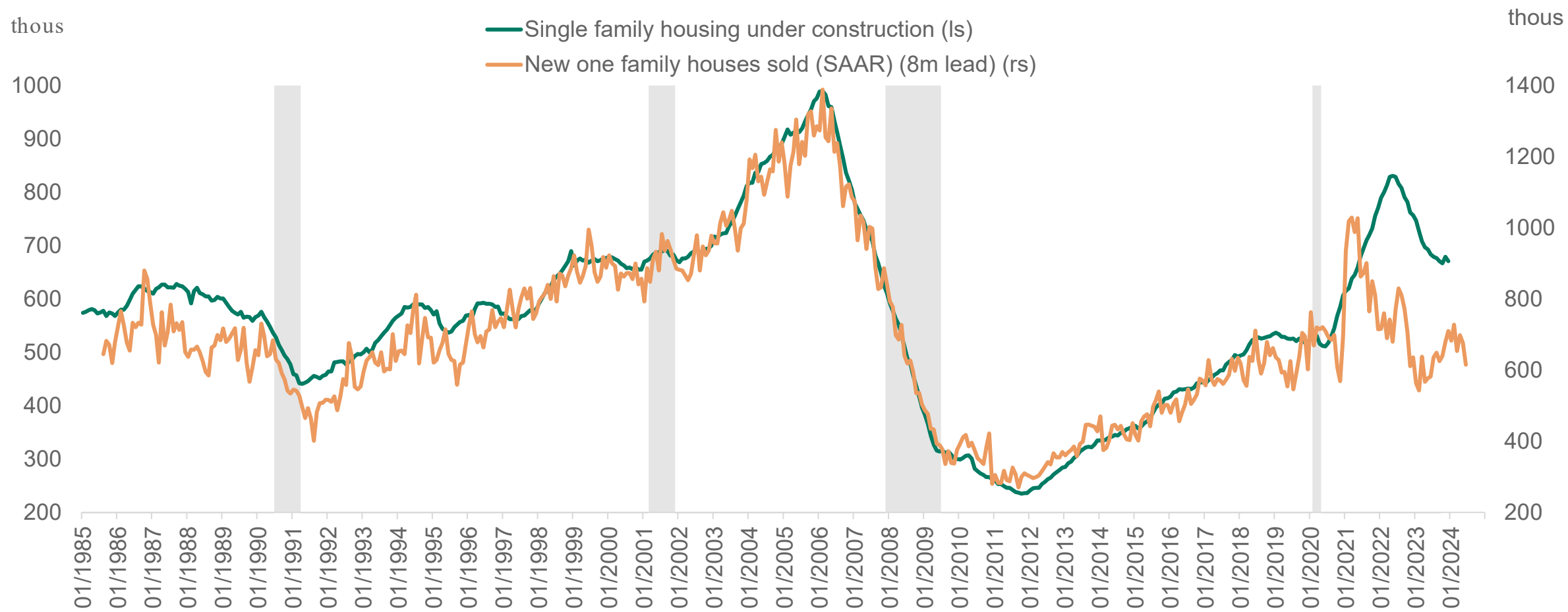
Source: Census Bureau, Bloomberg, Apollo Chief Economist.

Multifamily delinquencies rising

Source: Bloomberg, Apollo Chief Economist
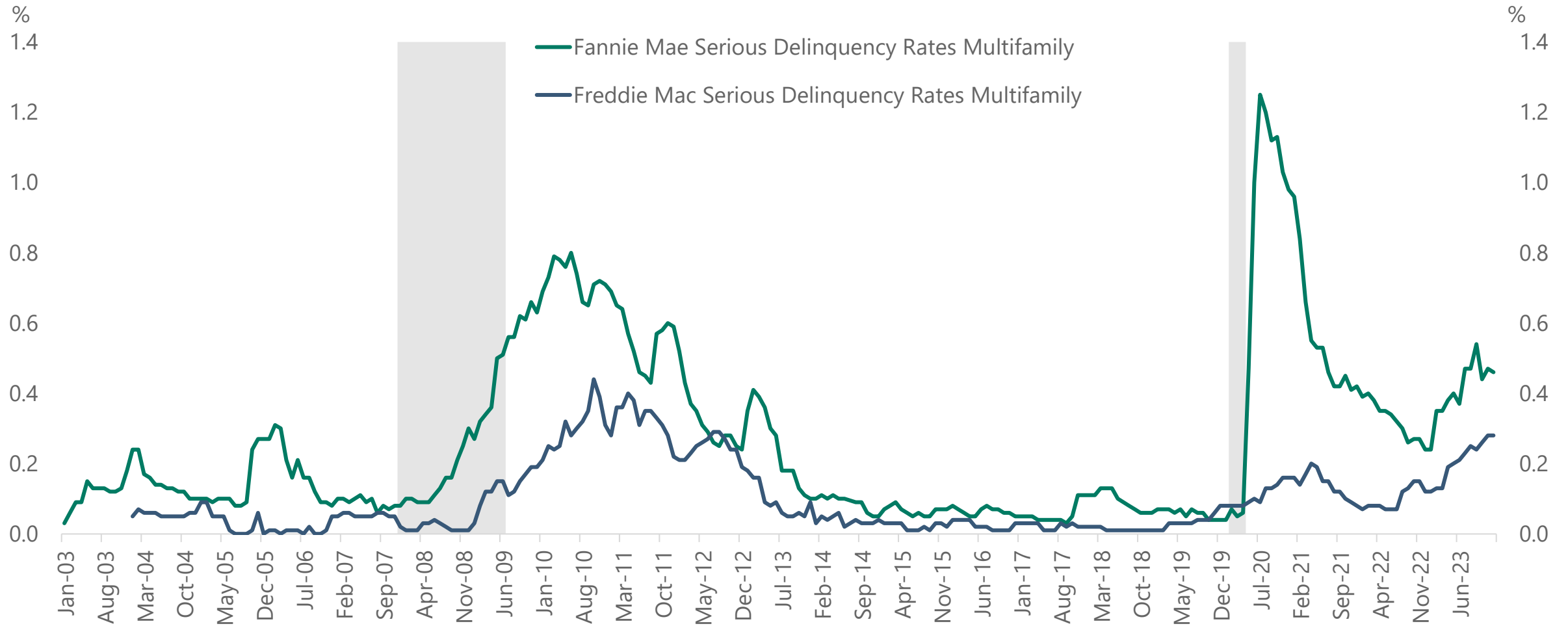
Residential investment as a share of real GDP declined to 3.3% from 9% in 1964

Private residential investment as a share of real GDP

Source: BEA, Haver Analytics, Apollo Chief Economist
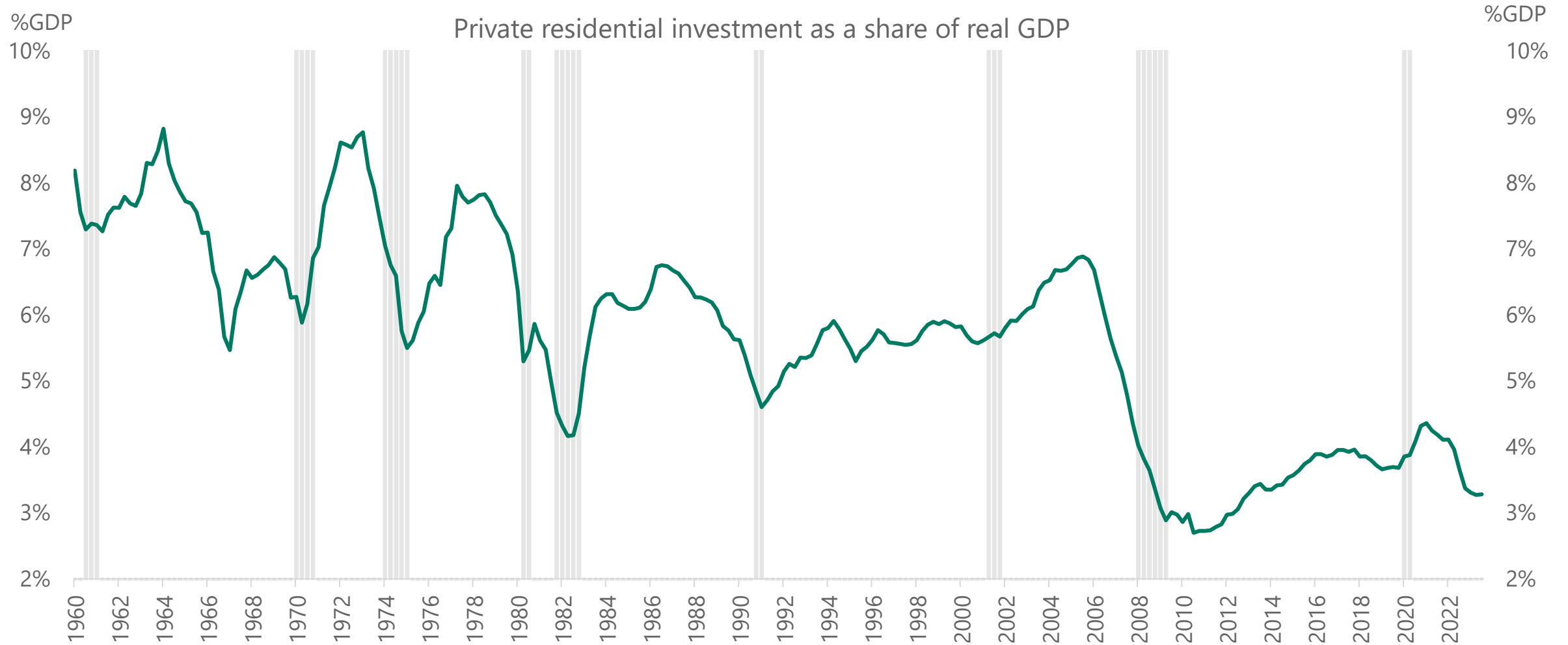
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63% of all mortgages outstanding were issued after 2018

Share of active US mortgages by issue date
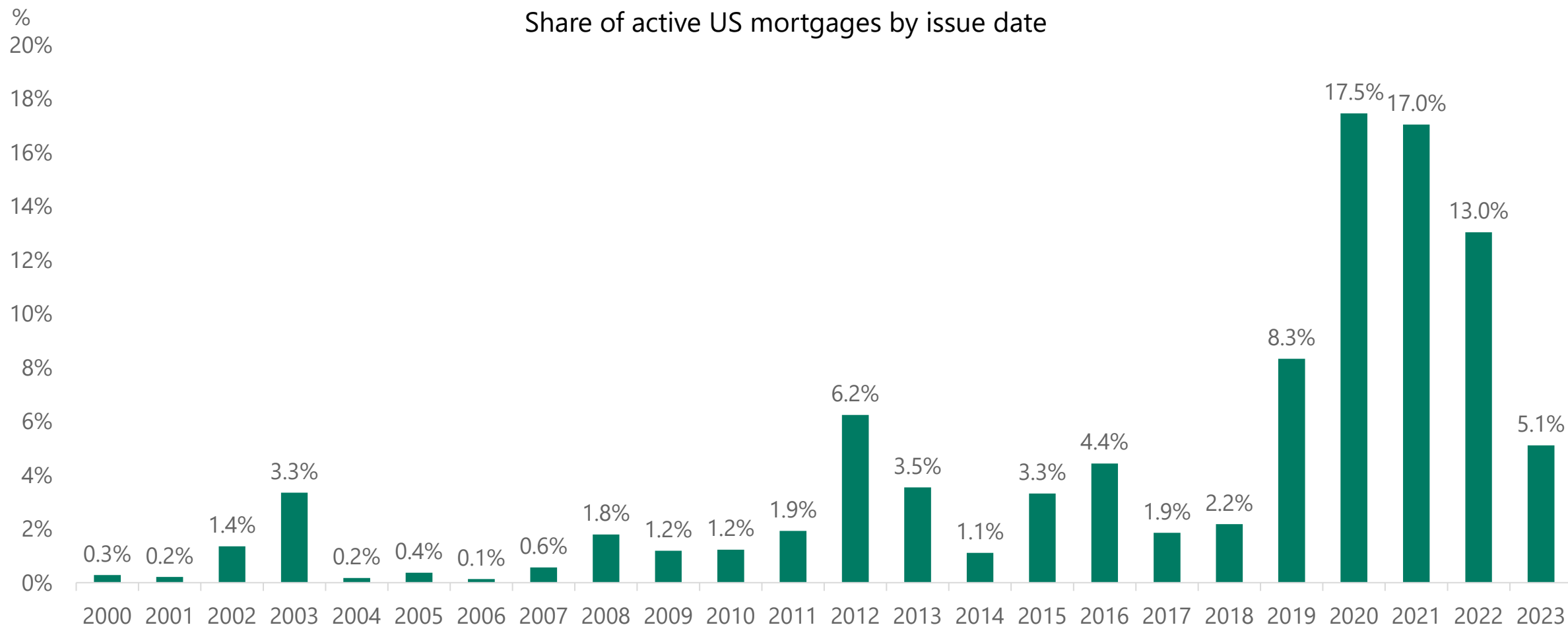
Fewer bidding wars recently

Average number of offers received per sold property

Source: NAR, Apollo Chief Economist
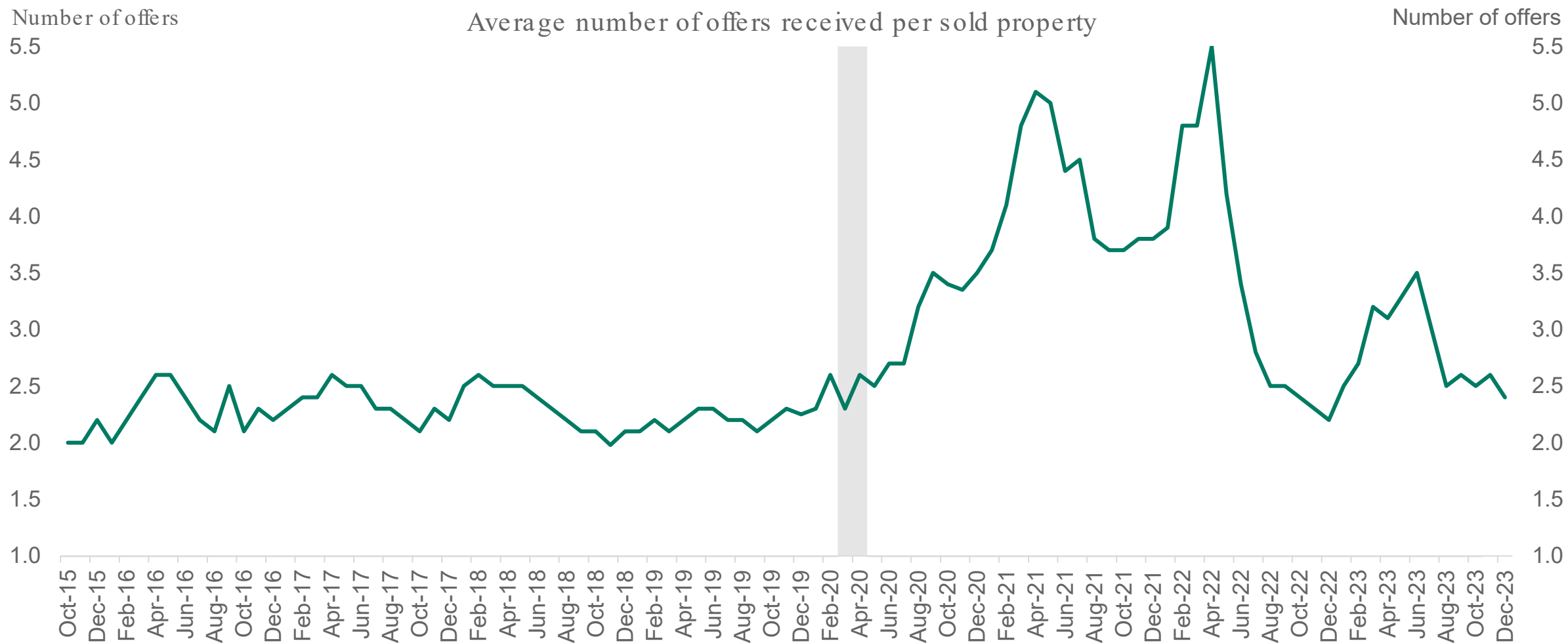
Seasonal increase in the inventory of homes for sale

Months' Supply of Existing Homes

Disconnect between mortgage rates and home prices

% yoy

% , inverted

— National home prices: Case-Shiller (ls)   — 30 year mortgage rate (1 yr lead) (rs)
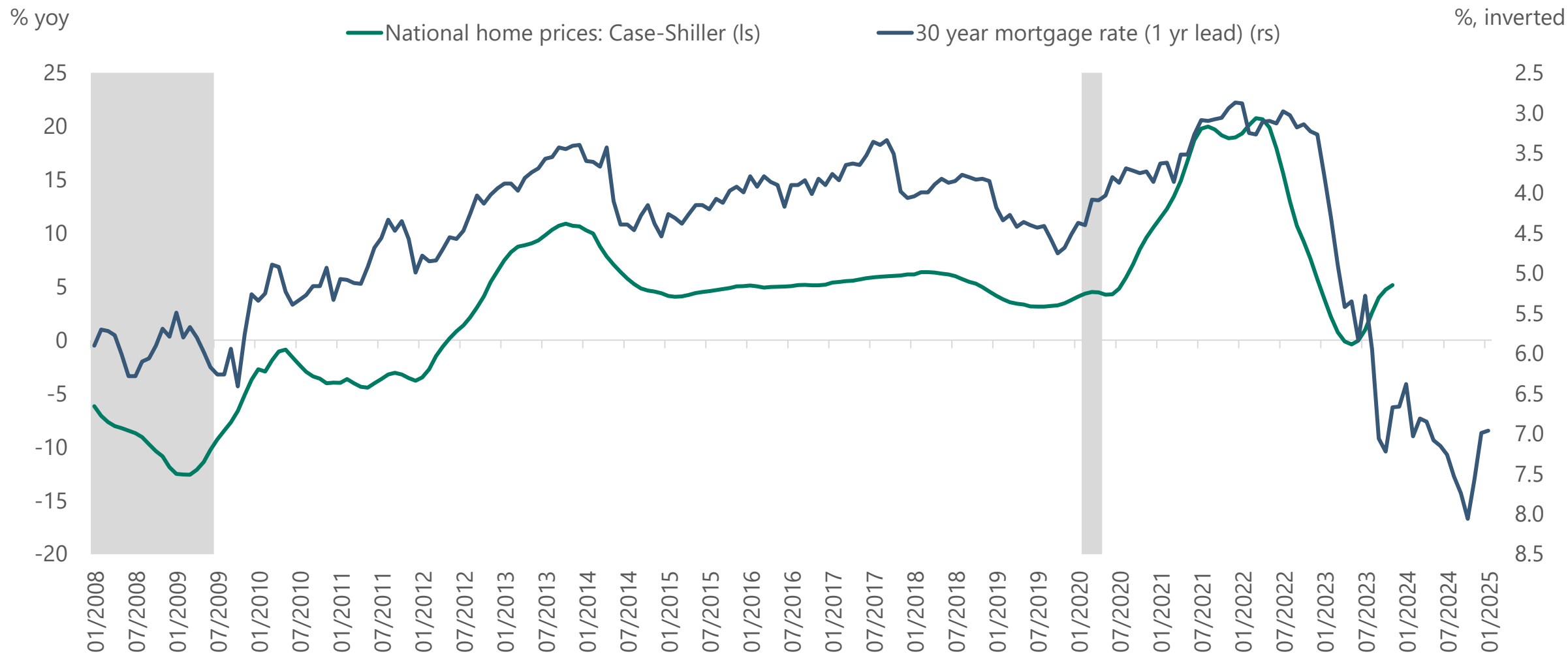
It currently takes 8 months on average to build a single-family house

Average Length of Time from Start to Completion

— Single-family homes   — 2 or more unit buildings

Months (left axis) / Months (right axis)
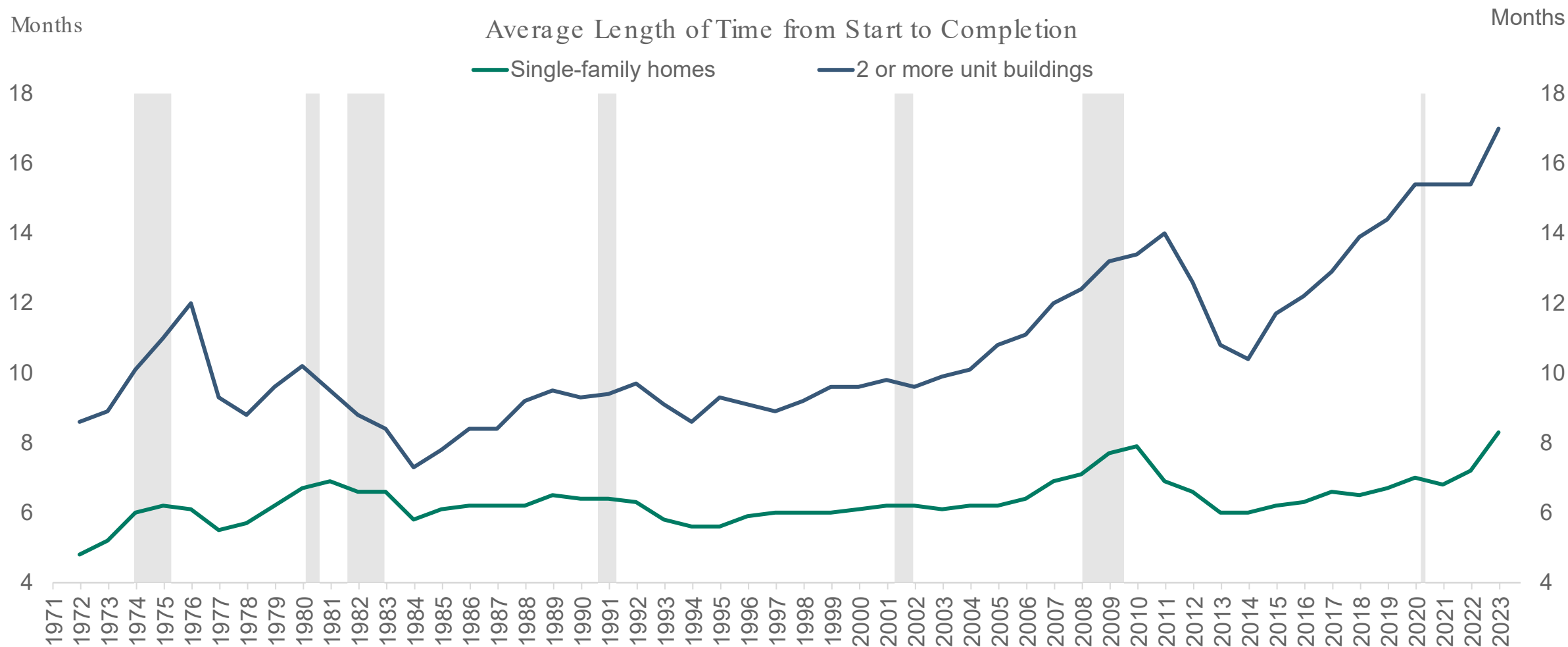
Source: Census, Haver Analytics, Apollo Chief Economist. Note: Single family homes are 1 unit buildings

3) House Prices: Home price inflation not yet impacted by higher mortgage rates

Median home sales price now $413.2K

Median Sales Price of Houses Sold for the United States

$ thous

$ thous

Source: Census Bureau, Apollo Chief Economist
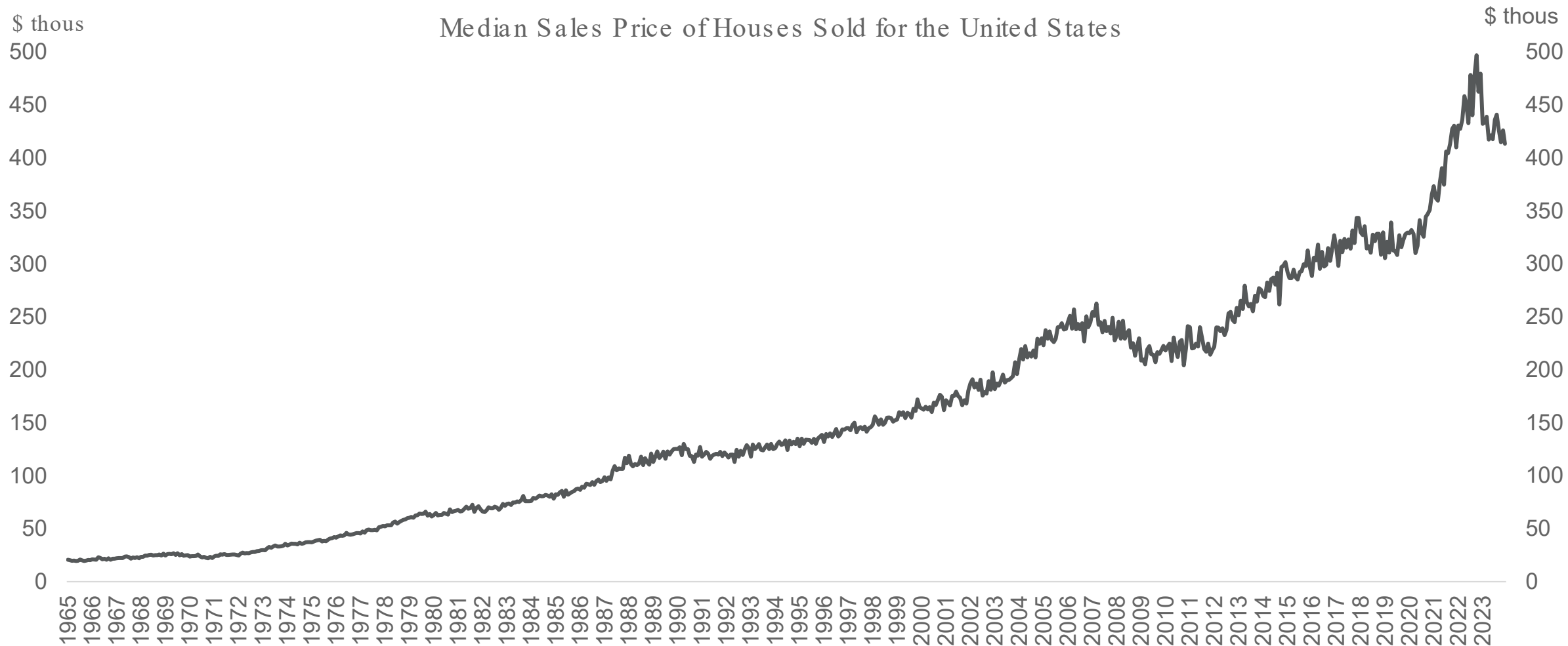
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House price inflation stabilizing across price tiers

Index   Home Price Appreciation Index   Index

Legend:
- Overall
- High Price Tier
- Low Price Tier
- Medium-High Price Tier
- Low-Medium Price Tier

Source: American Enterprise Institute, Haver, Apollo Chief Economist

78
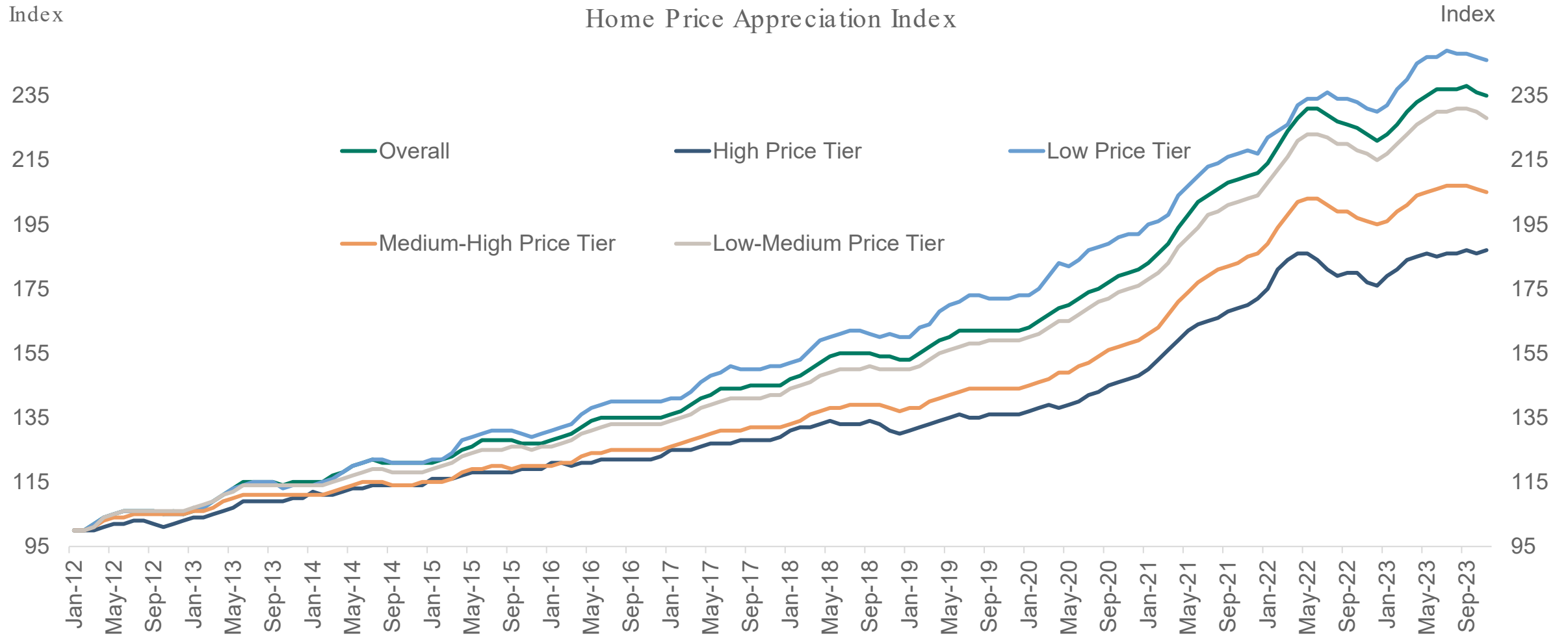
Home price to rent ratio significantly above 2006 levels
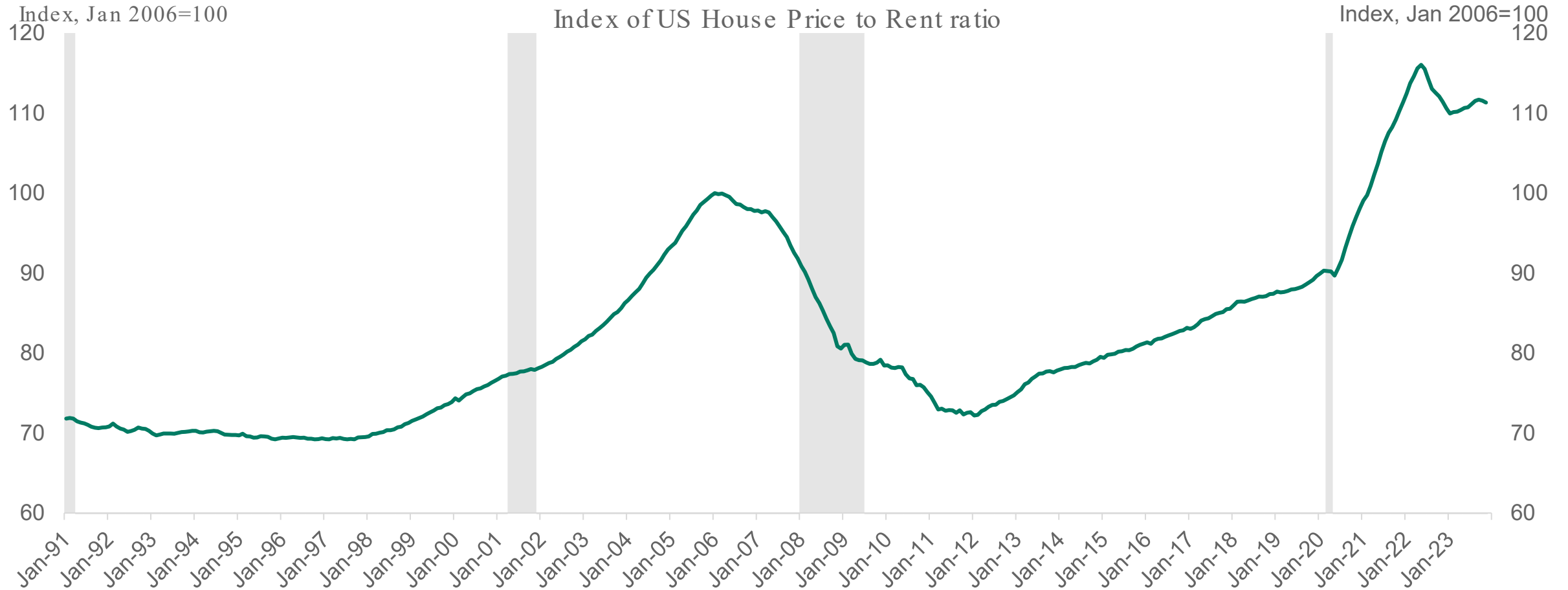
Index, Jan 2006=100

Index of US House Price to Rent ratio

Index, Jan 2006=100

Consumers' expectations of home price inflation

Home Price Expectations: Mean Increase in Home Value During the Next Year

Source: University of Michigan, Haver Analytics, Apollo Chief Economist
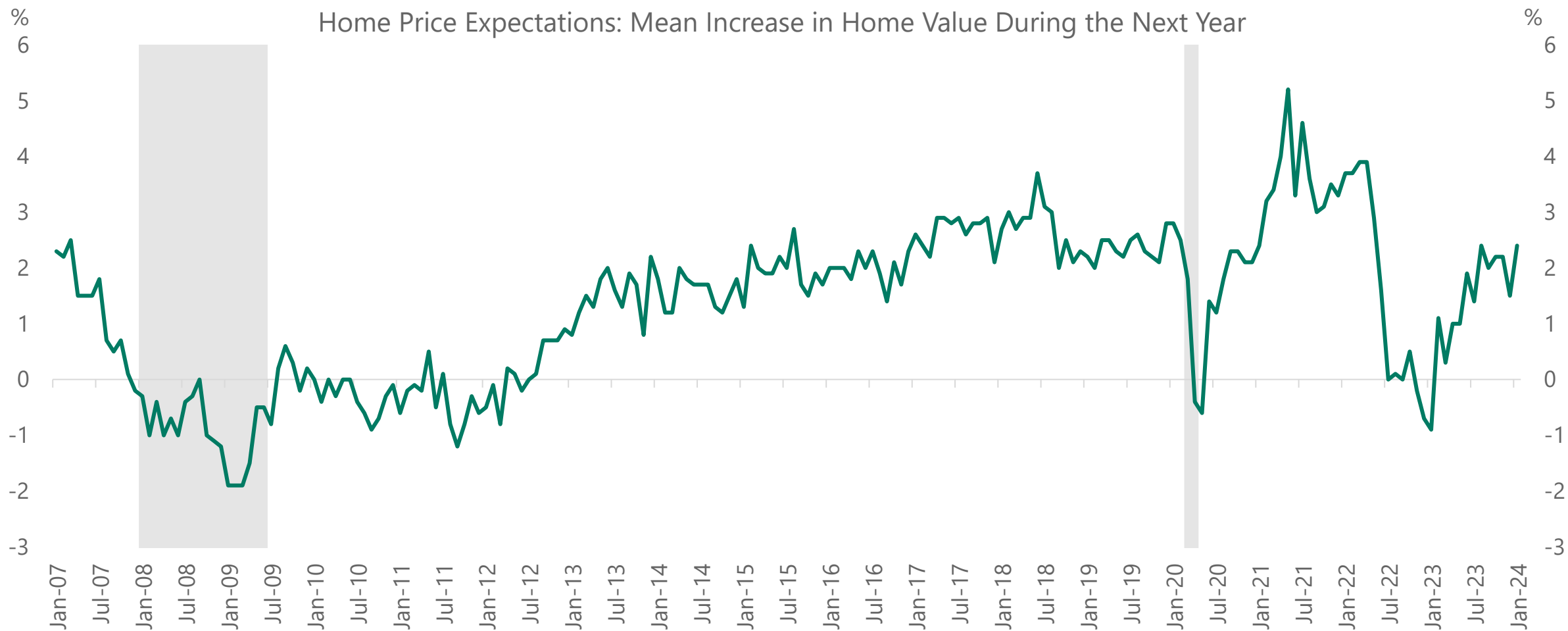
Median sales price well above last year's levels

Median sales price

2020 — 2021 — 2022 — 2023 — 2024 —
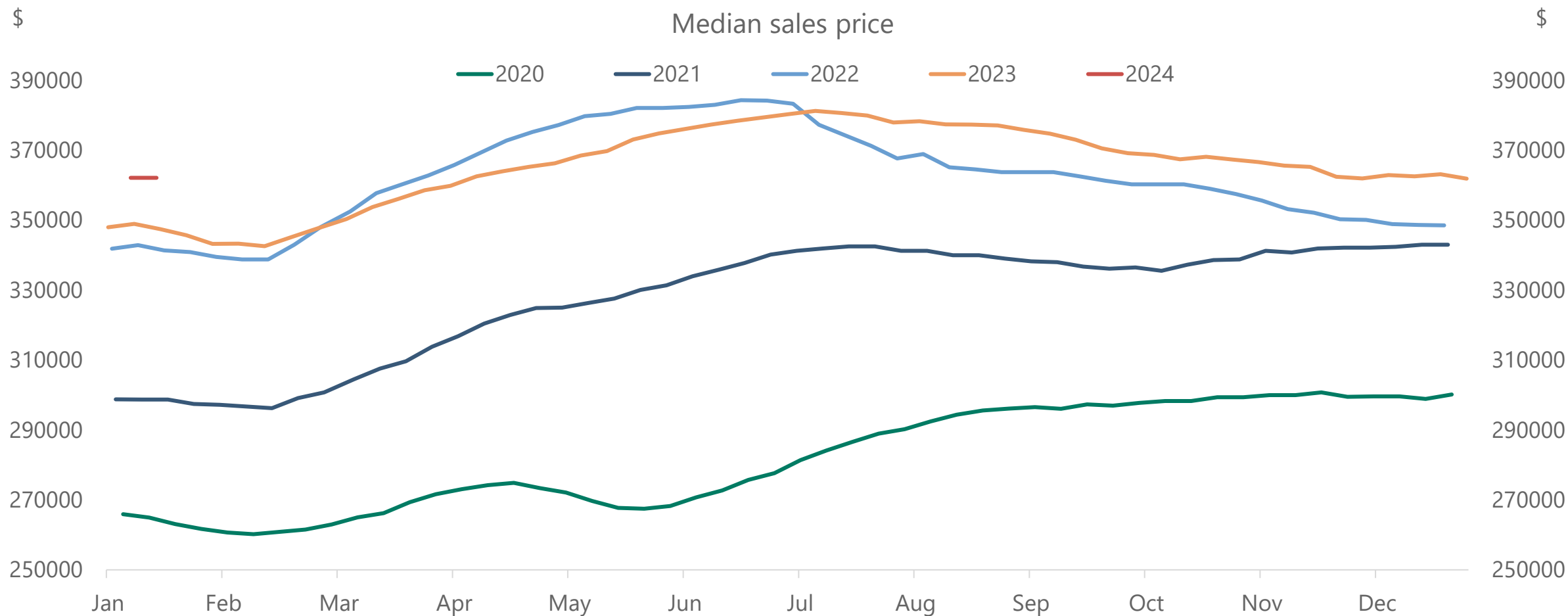
4) Housing Outlook: **High mortgage rates, high home prices, strong supply pipeline, and high building costs are risks to this housing cycle**

Housing construction costs are high

1986 = 100, NSA

PPI: inputs to residential construction, goods less foods & energy inputs

1986 = 100, NSA
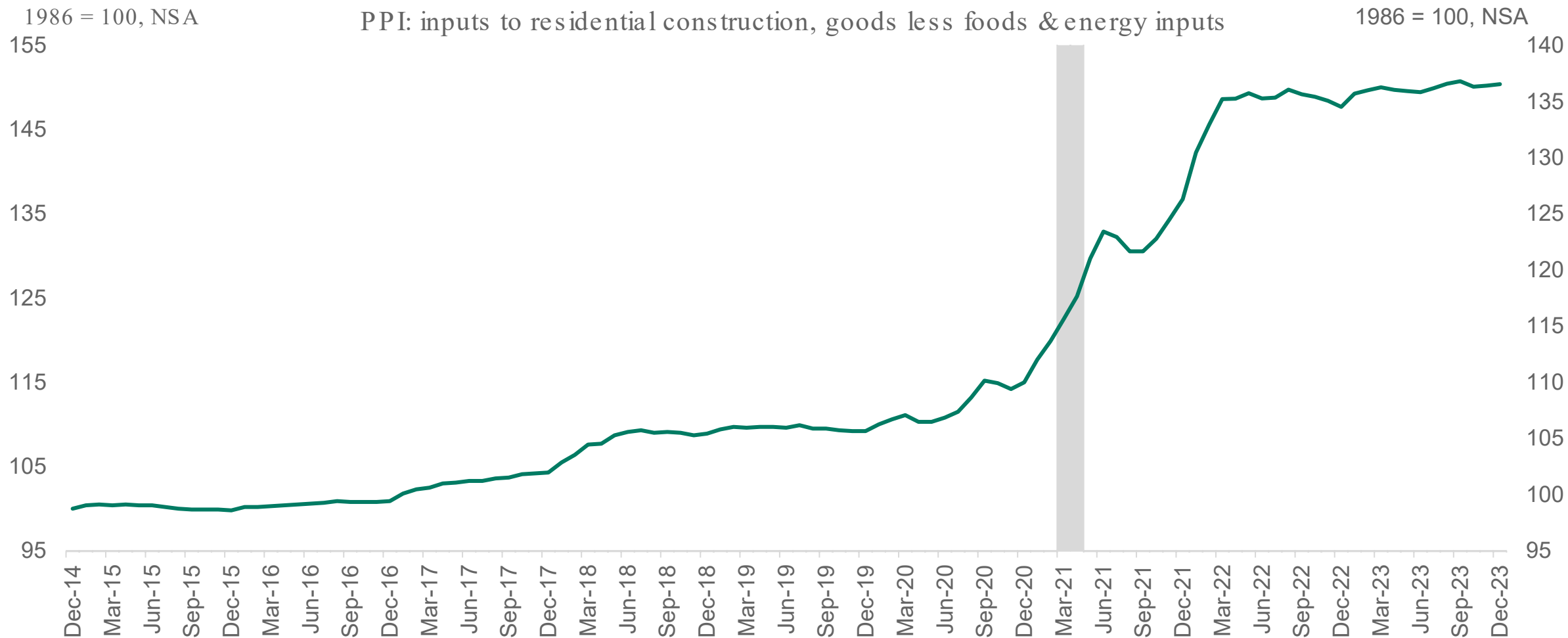
Source: Bureau of Labor Statistics, Apollo Chief Economist

Inflation in input costs for home builders rising

% YoY   % YoY

— PPI: Intermediate Demand Materials and Components for Construction

Manhattan median rent declined to $4009 in December 2023
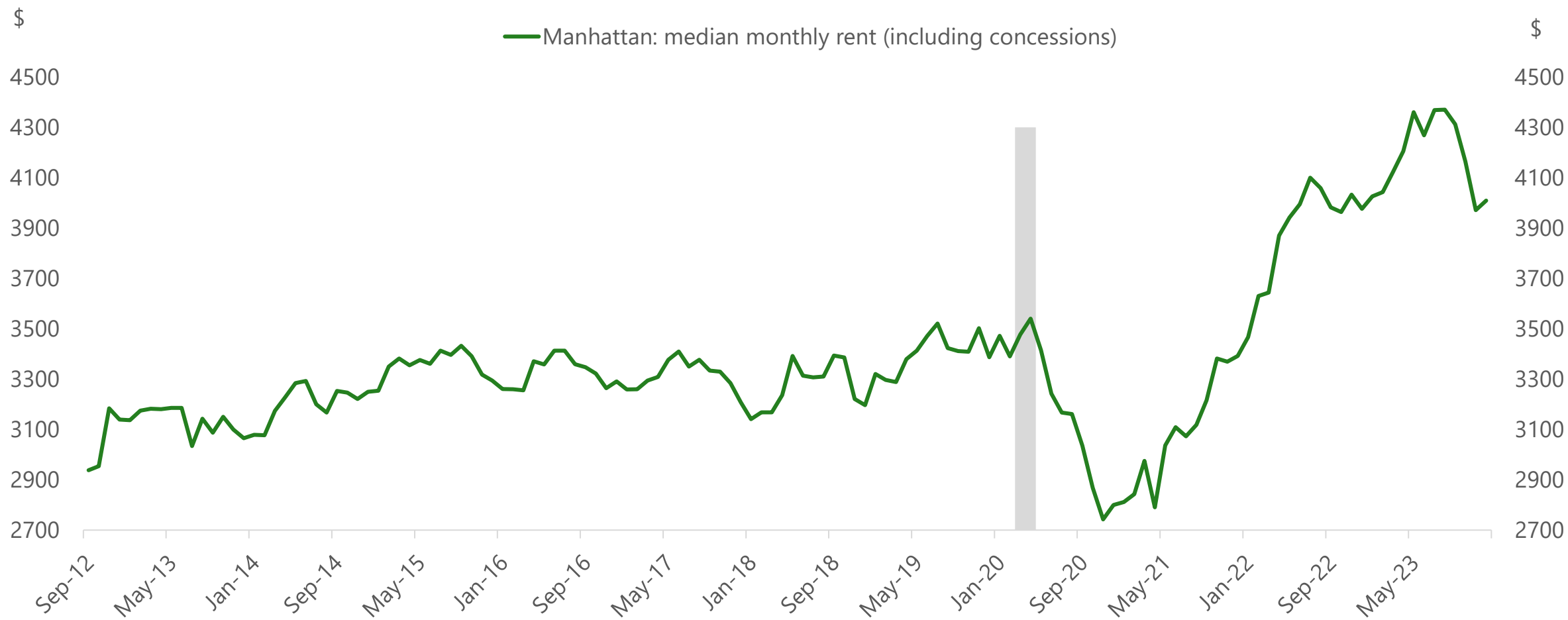
Manhattan rent growth slowing

% yoy

% yoy

Manhattan: median monthly rent (including concessions)
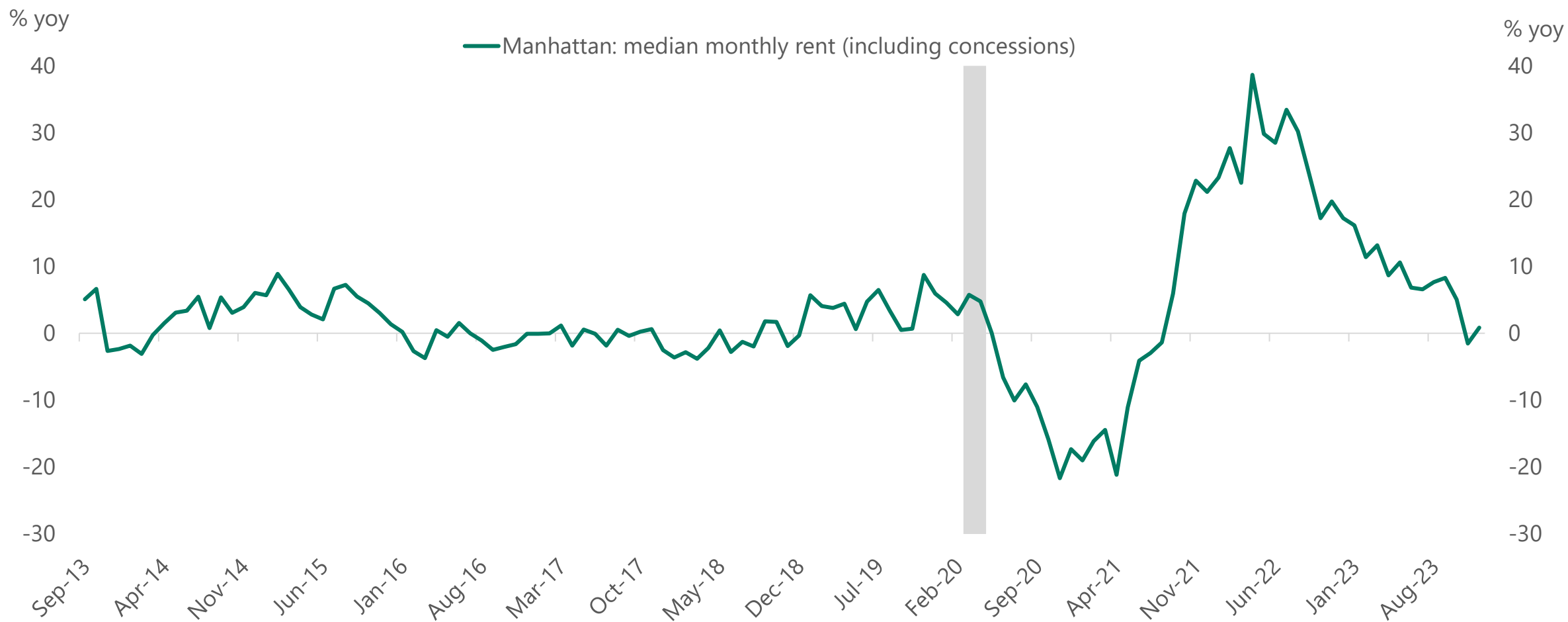
Manhattan rents still above pre-pandemic levels

% difference from Feb 2020

——Manhattan: median monthly rent (including concessions)

% difference from Feb 2020
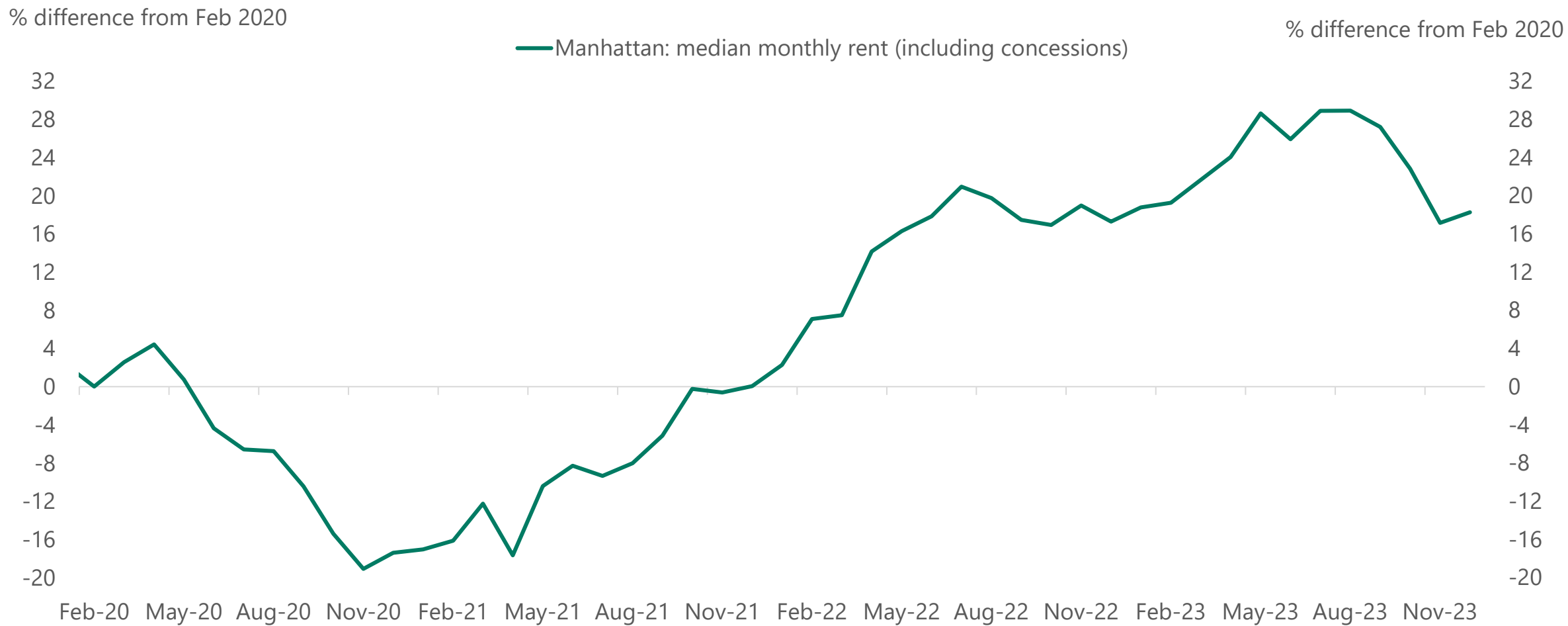
Rising mortgage rates generally associated with lower home price inflation

Scatter plot. X-axis: Increase in mortgage rates (%), ranging 0 to 8. Y-axis: Housing prices (%), ranging 0 to 60.

Data points labeled:
- 1977-1980: ~7.6, ~52
- 2003-2006: ~1.6, ~38
- 2015-2018: ~1.4, ~22
- 1987-1989: ~2.1, ~17
- 1971-1974: ~2.7, ~18
- 2012-2013: ~1.2, ~11
- 1998-2000: ~2.0, ~13
- 1983-1984: ~2.0, ~6
- 1993-1994: ~2.4, ~3
- 1980-1981: ~6.2, ~7
- (unlabeled): ~0.7, ~52
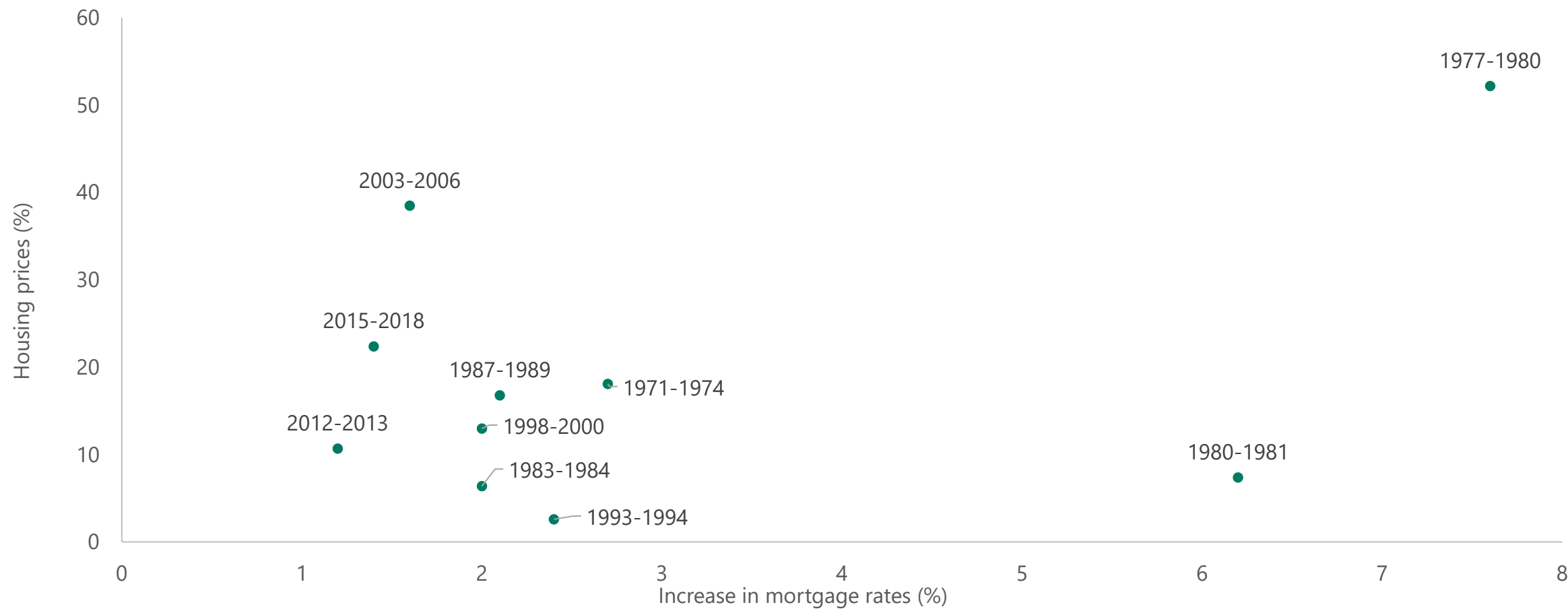
New foreclosures, by age of homeowner

New foreclosures by age

thous

Legend: 70+ | 60-69 | 50-59 | 40-49 | 30-39 | 18-29
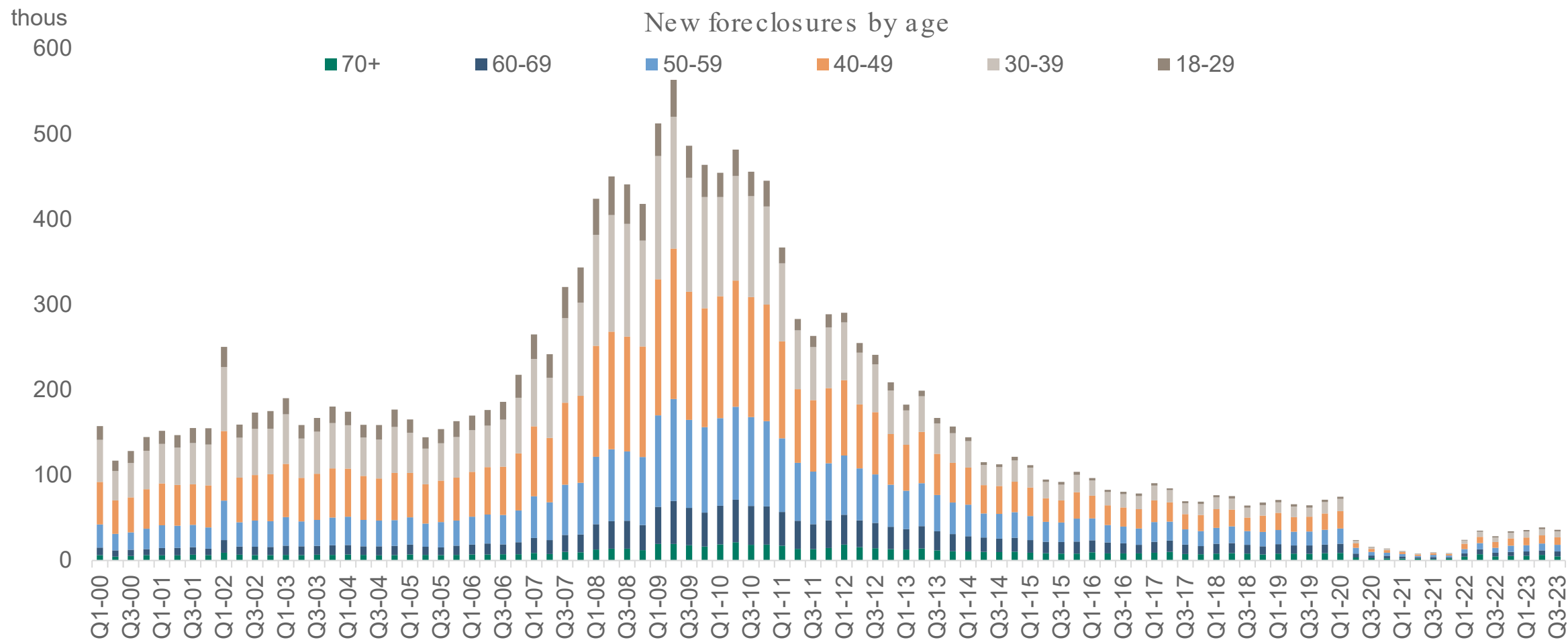
Source: FRBNY Consumer Credit Panel, Equifax, Haver Analytics, Apollo Chief Economist

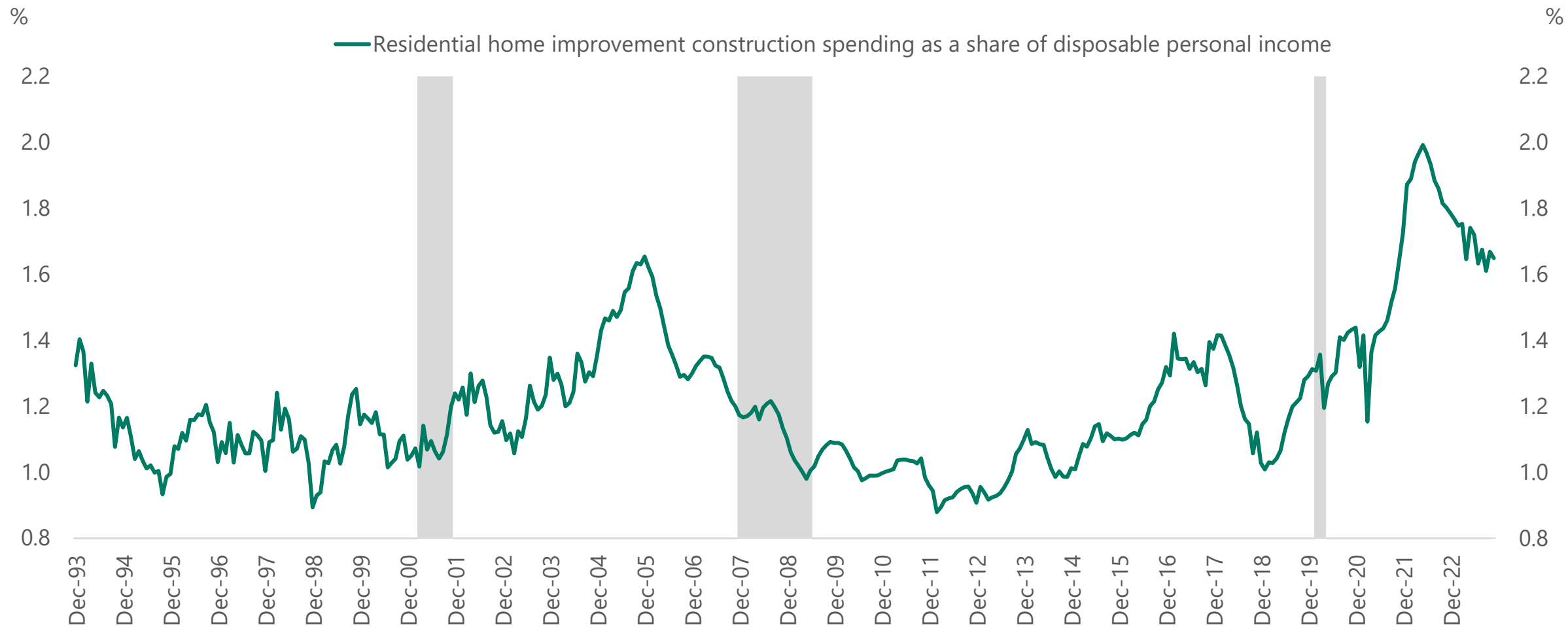# Median distance between the home that recent buyers purchased and the home they moved from at 50 miles in 2022

Miles

Median distance between the home that recent buyers purchased and the home they moved
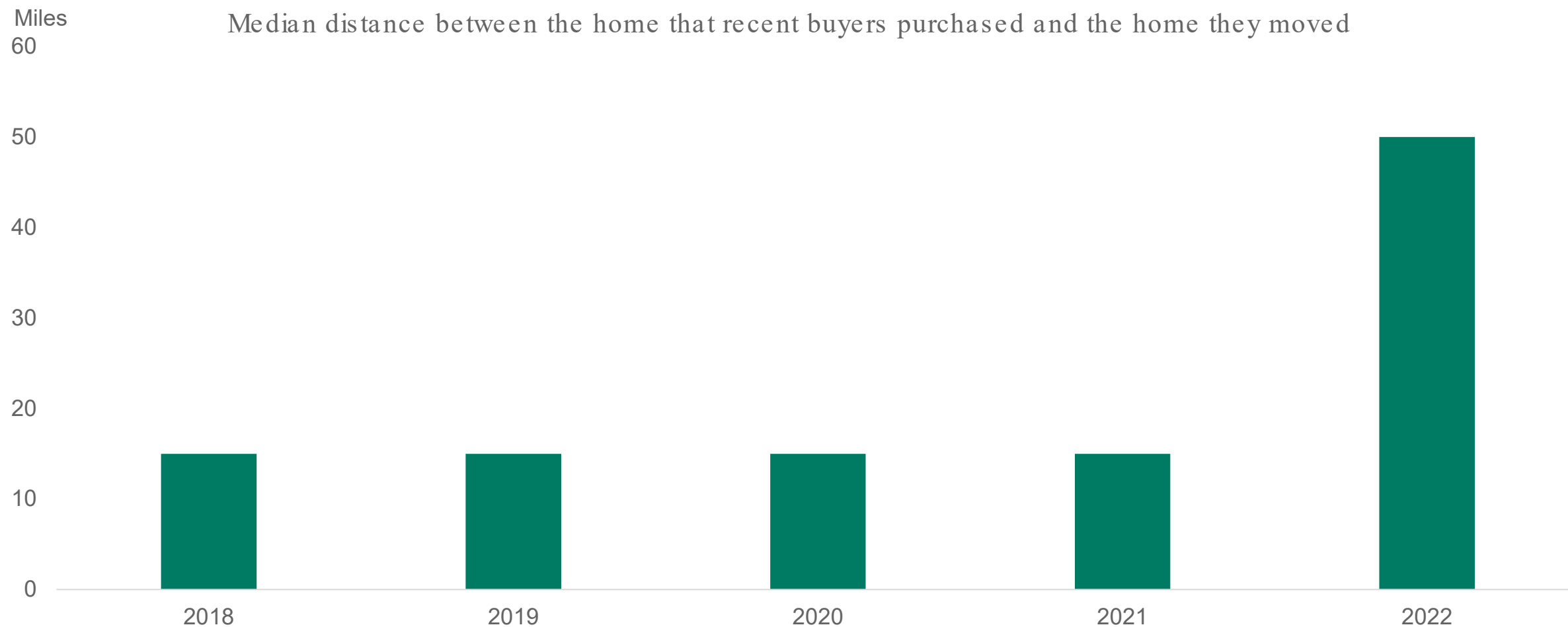
Home improvement spending remains at high levels

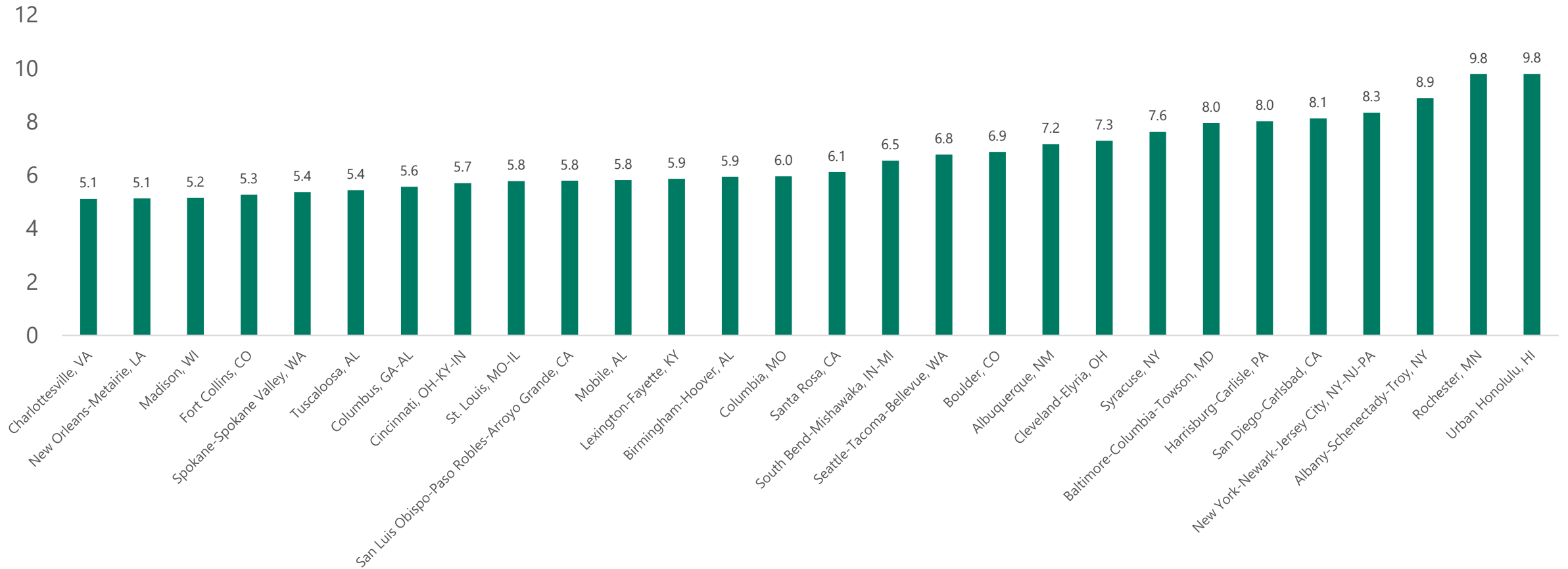% Residential home improvement construction spending as a share of disposable personal income %

Source: Census Bureau, BEA, Bloomberg, Apollo Chief Economist

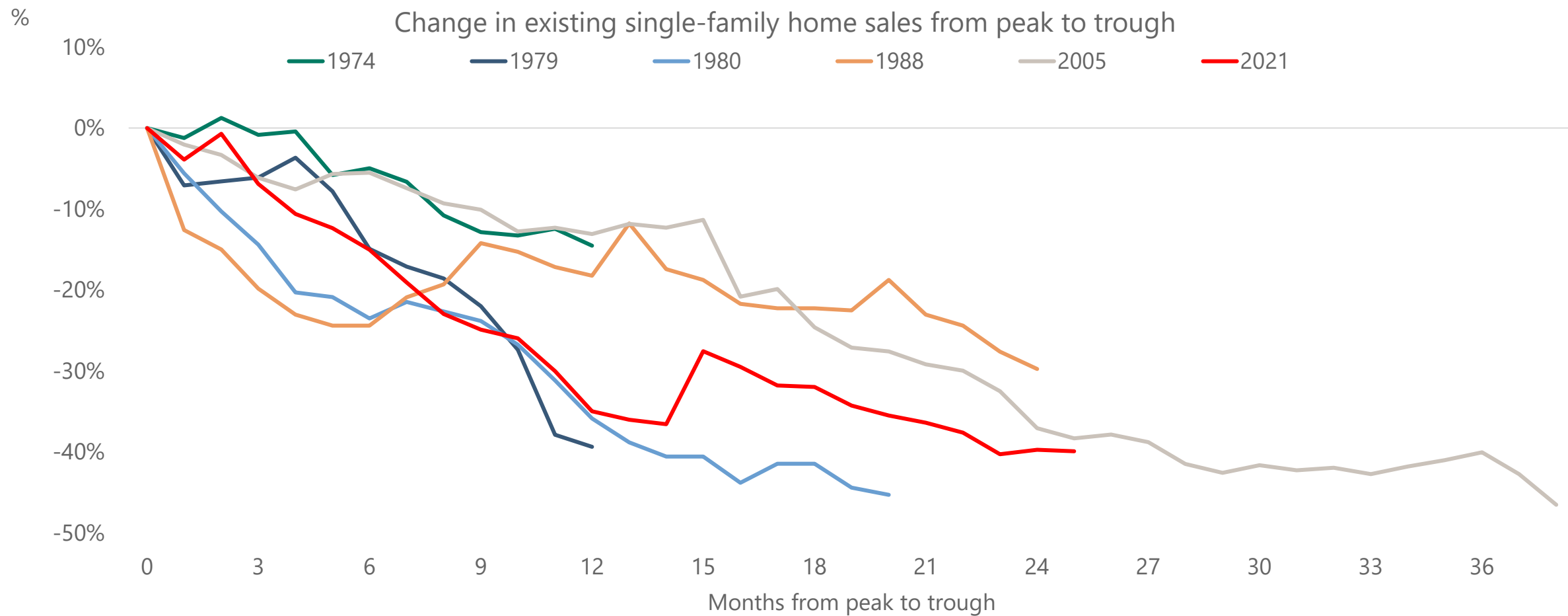# Areas that need to build more houses to keep up with the increased demand

Permit (total units)

Housing shortage

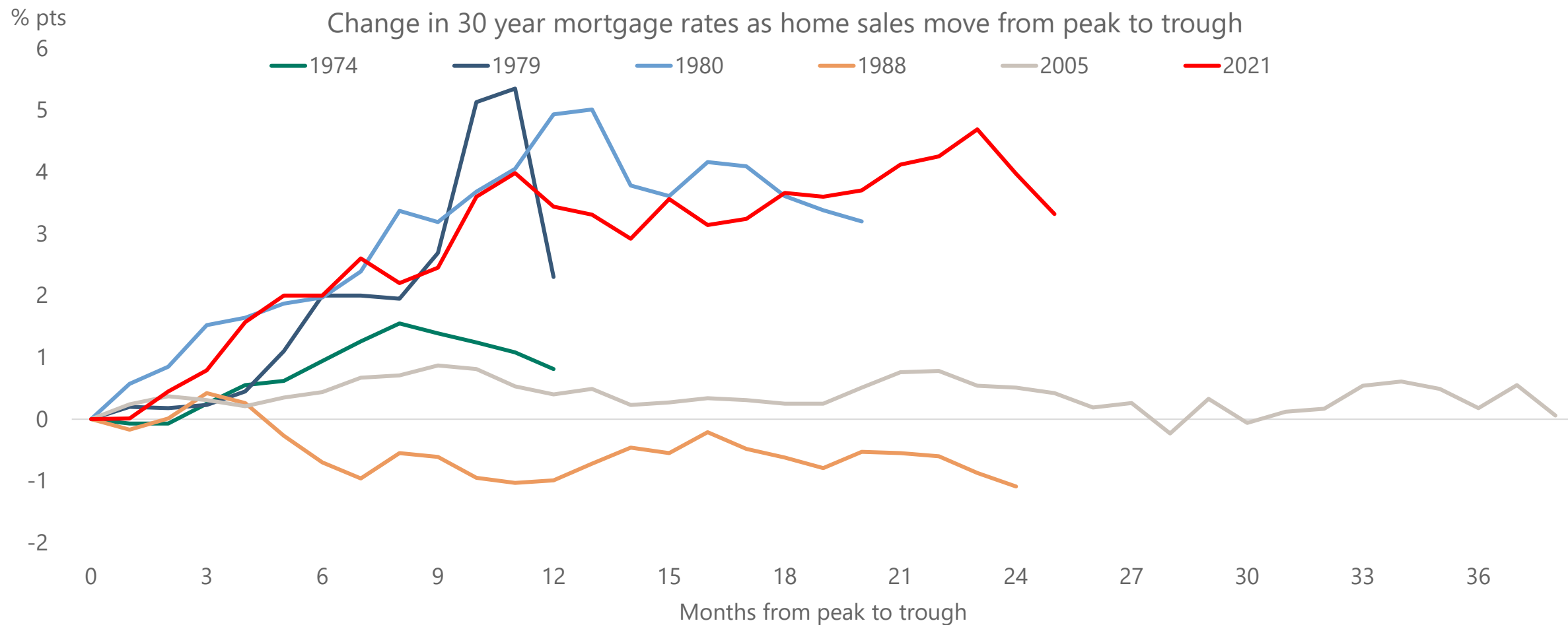Source: NAR, Apollo Chief Economist

Comparing the current housing slowdown to previous housing slowdowns

The current decline in existing home sales is in line with previous housing slowdowns

Change in existing single-family home sales from peak to trough

— 1974   — 1979   — 1980   — 1988   — 2005   — 2021

Months from peak to trough

Source: NAR, Haver Analytics, Apollo Chief Economist

The current rise in mortgage rates is similar to what we saw during the Volcker disinflation

Change in 30 year mortgage rates as home sales move from peak to trough

— 1974 — 1979 — 1980 — 1988 — 2005 — 2021

Months from peak to trough

% pts

Source: NAR, Haver Analytics, Freddie Mac, Bloomberg, Apollo Chief Economist

95

The current decline in housing starts follows the pattern of previous slowdowns

Change in housing starts from peak to trough

Legend: 1972, 1978, 1981, 1986, 2006, 2022

Months from peak to trough

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96
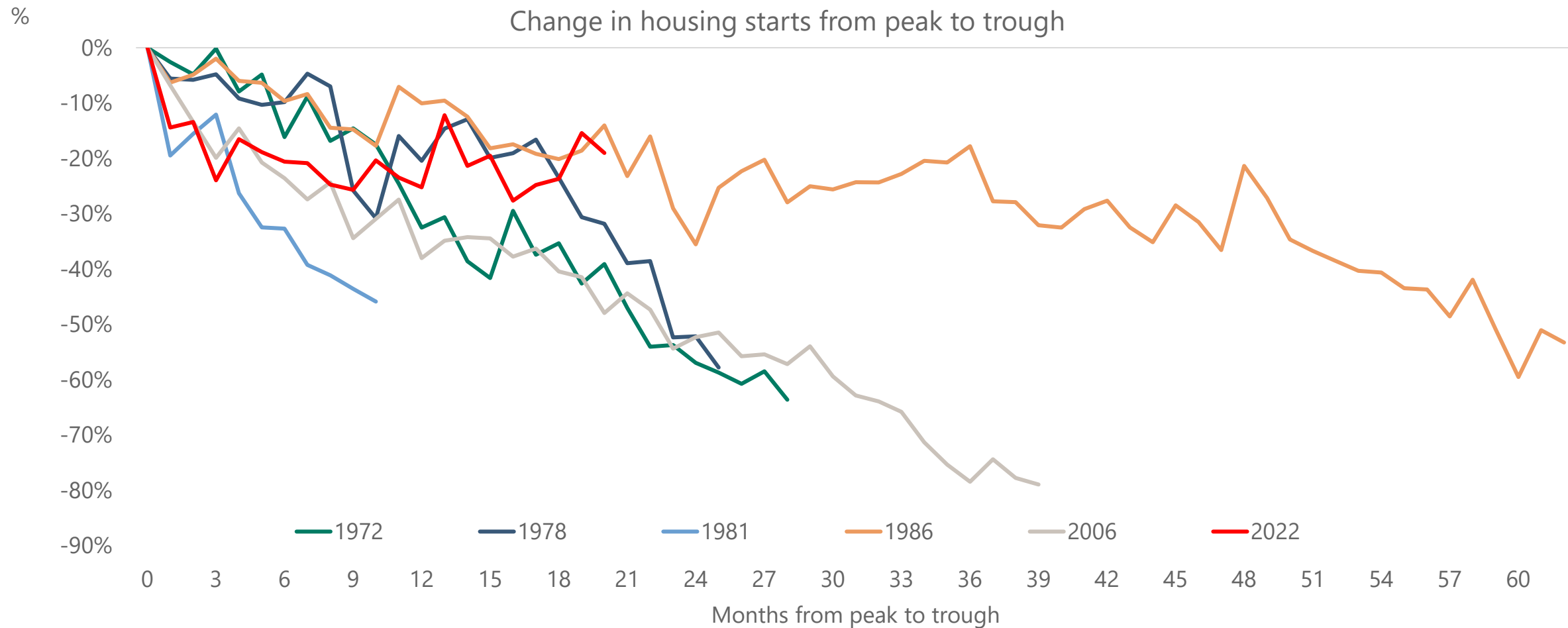
This is the fastest Fed-driven housing slowdown on record

Change in existing single-family home sales during Fed tightening cycles

—1977 —1983 —1994 —1999 —2004 —2015 —2022

Months from first Fed hike

Source: NAR, Haver Analytics, Apollo Chief Economist

97
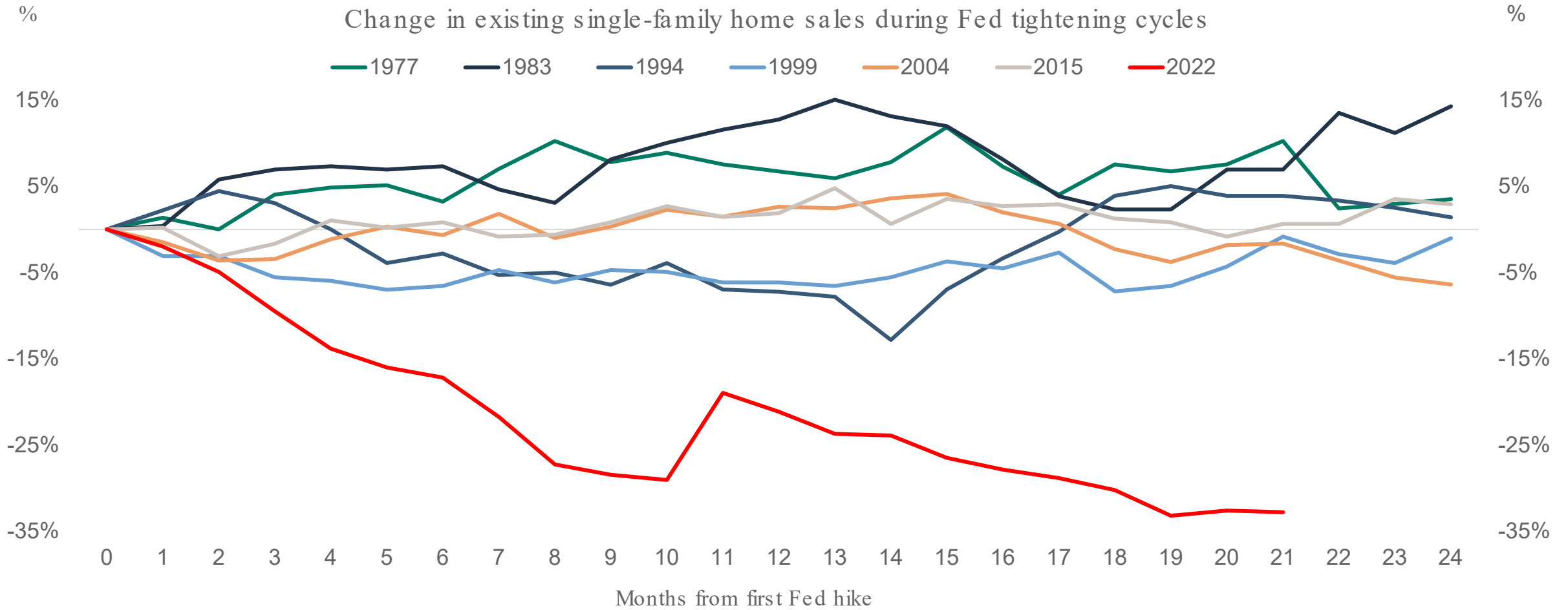
Homebuyers are getting older

Source: NAR, Apollo Chief Economist
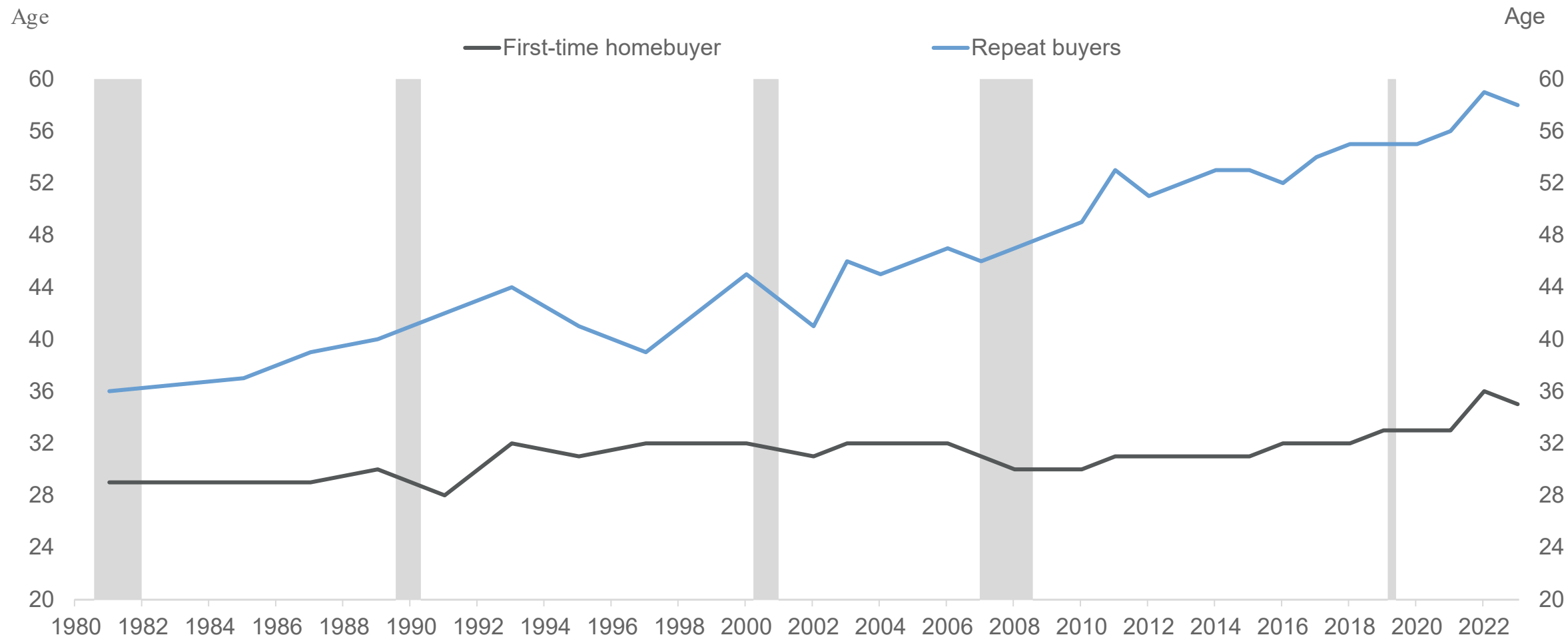
The median age of all homebuyers is now 49 years old, up from 31 in 1981

Median age of all homebuyers
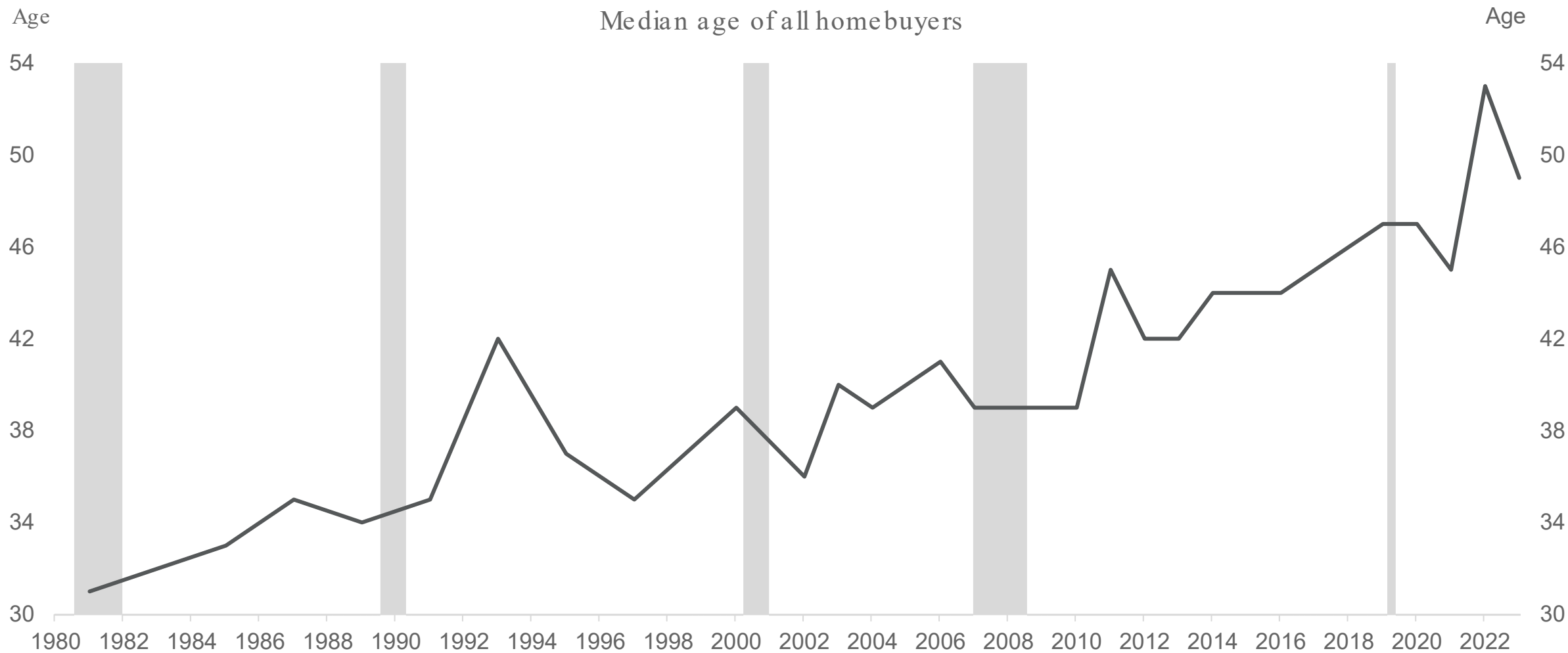
Apartment vacancies are back above pre-pandemic levels

— Apartment list national vacancy index

Source: Apartmentlist.com, Apollo Chief Economist
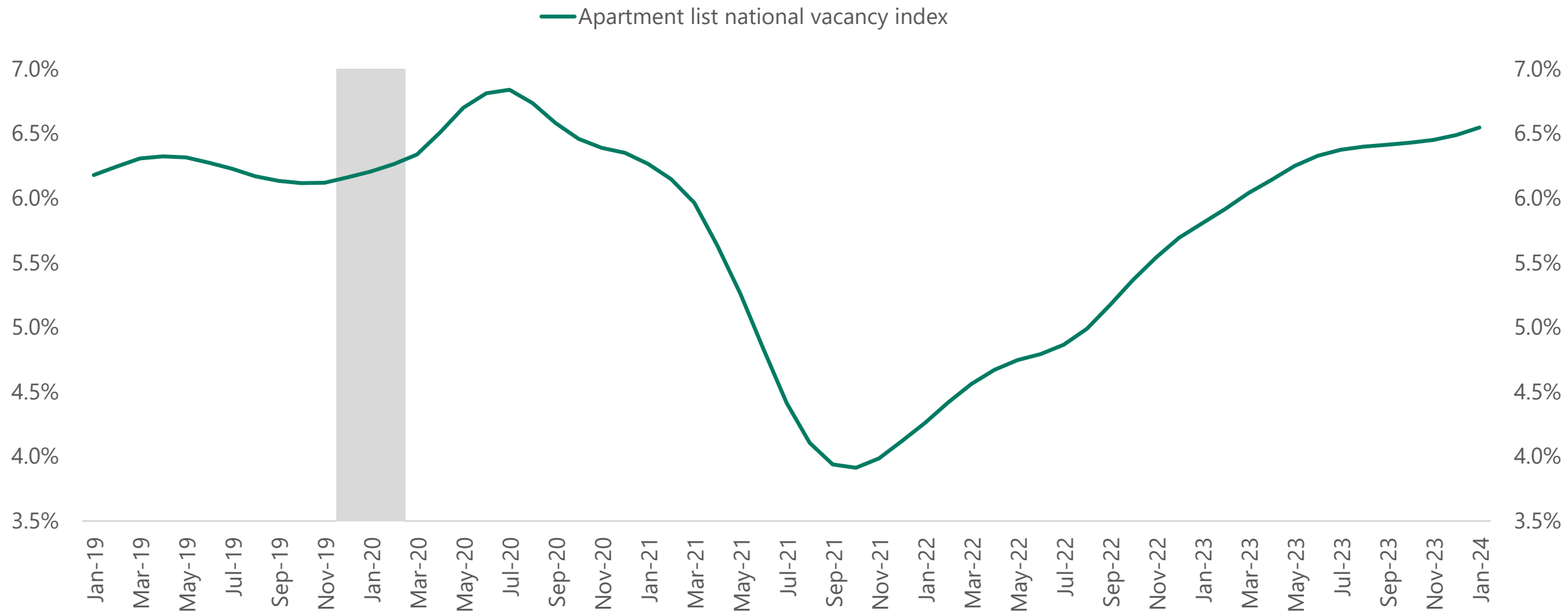
When the Fed raised interest rates employment in retail trade declined

Source: BLS, Haver Analytics, Apollo Chief Economist
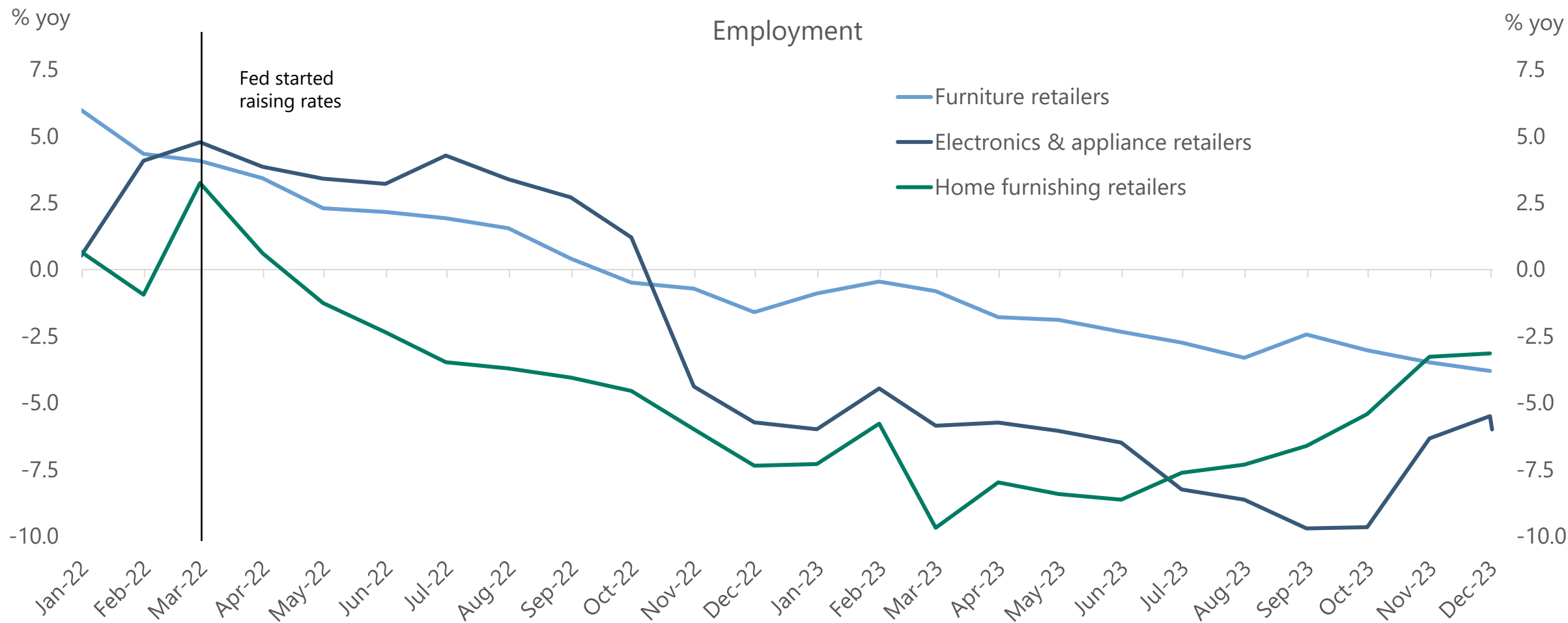
US apartment supply increasing
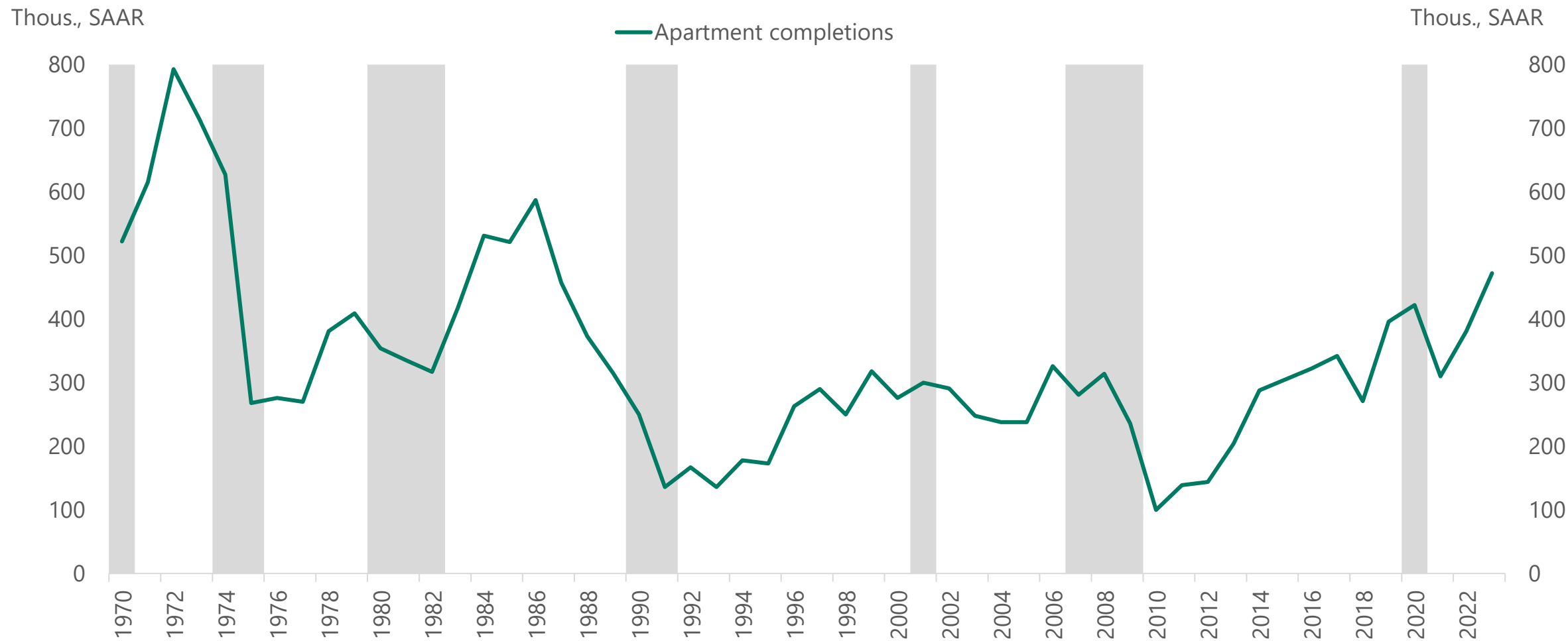
The average family size in the US has declined from 3.3 in 1960 to 2.5 by 2023.

Average number of people per household
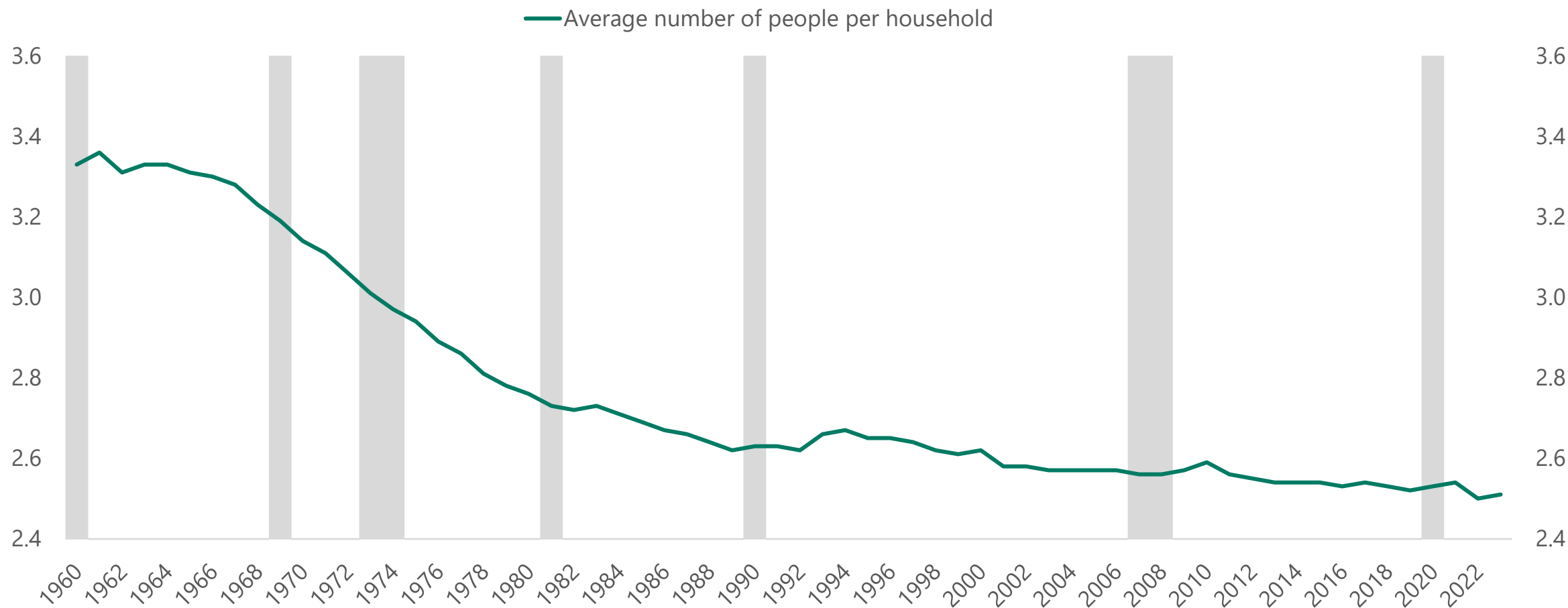
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Torsten Slok joined Apollo in August 2020 as Chief Economist and he leads Apollo's macroeconomic and market analysis across the platform.

Prior to joining, Mr. Slok worked for 15 years as Chief Economist at Deutsche Bank where his team was top ranked in the annual Institutional Investor survey for a decade. Prior to joining Deutsche Bank Mr. Slok worked at the IMF in Washington, DC and at the OECD in Paris.

Mr. Slok has a Ph.D in Economics and has studied at the University of Copenhagen and Princeton University.