

AEI Housing Market Indicators (HMI)

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AEI Housing Center

[AEI.org/housing](https://www.aei.org/housing)

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Link to AEI HMIs:

<https://www.aei.org/housing/housing-market-indicators/>

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AEI Housing Market Indicators: An Introduction

- Provide accurate and timely metrics for the housing market. These include:
 - Mortgage Risk/Leverage
 - Particular attention is paid to agency first-time buyer volume and risk
 - House price appreciation trends
 - Housing sales
 - New and existing sales whether institutionally financed, cash, or other-financed
 - Months' inventory
- The housing market is influenced by many different levers. Measuring and evaluating with the right metrics provides a clearer understanding of market trends.
 - AEI HMI adds geography and price points to the broad set of metrics:
 - Geography: national, state, and selected metros
 - House prices down to the census tract level
 - Price points: low, low-medium, medium-high, and high price tiers
 - Price tiers are defined based on the availability of leverage for borrowers at the metro level.
- Expanded Housing Market Indicators use and connect many different datasets:
 - HMDA
 - Public Records Data
 - National Mortgage Risk Index (agency MBS data)
 - CoreLogic's LLMA and Black Knight's McDash (servicer data)
 - Fannie Mae's Loan Performance data and Freddie Mac's Loan-Level Data (acquisition data)
 - FHA Snapshot data (endorsement data)
 - Data from Zillow on existing home sales and unique listings
- Advantages of the AEI Housing Market Indicators:
 - Most in-depth resource for key housing data and trends (select data available online for download)
 - Accurate, timely, and in-depth coverage of purchase trends
 - Connects the dots for many housing indicators, yielding the most comprehensive analysis of the housing market and boom/bust cycles
- Detailed methodologies are available after "Remaining Briefing Dates" slide.

What are the AEI Housing Market Indicators?

Indicator	Key Metric(s)	Additional Features	Geography	Frequency	Tier/ Segment	Purpose
Home Prices & Supply	HPA, Months' Supply	Interactive maps & price tier cutoffs	National, largest 40 metros	Monthly	Overall & 4 tiers	Real-time data on HPA & months' supply for 40 metros.
National & Metro Housing Market Indicators	HPA, Months' Supply, Mortgage Risk Index, Average Sale Price, NC Share of Sales	Reports for each metro & interactive maps	National, largest 60 metros	Quarterly	Overall & entry-level & move-up	A more comprehensive analysis of the housing market in 60 metros (but slightly less recent & only for 2 market segments).
Mortgage Risk Index	Mortgage Risk Index	Time series data on credit scores, CLTVs, DTIs, & other key metrics	National	Monthly	Overall, first-time & repeat buyers	Comprehensive resource for mortgage origination & risk data for agency loans.
The State of the Housing Market	County & State data: HPA, Months' Supply, NC, Mortgage Risk Index, Entry-Level Price-to-Income Ratio	Housing market metrics (supply, NC, leverage, etc.) & how they affect entry-level affordability	State & county, some metro indicators	Annual	Varies by indicator	A multitude of housing market indicators at the county & state level. These data are aggregated to derive trends on the state of the housing market.
The Carpenter Index	Share of Entry-level Sales Affordable to the Average Carpenter Household	Metro rankings, affordability heat map, change in affordability, & other affordability metrics	Largest 100 metros	Annual	Entry-level	"They can build it, but can they afford it?" The study ranks housing affordability in the entry-level market for 100 metros for blue-collar workers.

HPA = Home Price Appreciation; NC = New Construction; FTB = First-time Buyer; Tier/Segment = Price Tier/Market Segment

<https://www.aei.org/housing/housing-market-indicators/>

What are the AEI Housing Market Indicators? (cont.)

Indicator	Key Metric(s)	Additional Features	Geography	Frequency	Tier/ Segment	Purpose
Best & Worst Metros to Be a FTB	Price-to-Income Ratio for over 3 million FTB Purchases	FTB stats on home prices, income, price/sq. ft., & sq. ft. of living area	Largest 50 metros	Annual	First-time buyers	This study ranks 50 metros based on their affordability for first-time homebuyers.
New Construction - still in development	NC Share of Sales	TBD	National, State, County, ZIP, Census Tract	Quarterly	Overall & 3 tiers (combines med-high & high)	Real-time NC data at the census tract level & above.
Land Price and Land Share	Change in Land Share and Land Prices	Interactive maps on land prices, land shares, & changes over time in these indicators	ZIP (also census tract, county, metro, state, & nation)	Annual	None	The change in land share has been found to be highly predictive of house price boom/bust cycles.
Market Trends Report - still in development	TBD	TBD	107+ million U.S. property addresses	Updated as data become available	Overall & 4 tiers	Provides trends affecting the market price & intrinsic value of the subject property, the subject's neighborhood, & its broader market areas.
Collateral Risk - still in development	TBD	TBD	majority of ZIP Codes/Census Tracts	Annually	None	Identify areas most at-risk from an economic downturn

HPA = Home Price Appreciation; NC = New Construction; FTB = First-time Buyer; Tier/Segment = Price Tier/Market Segment

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Indicators and Data

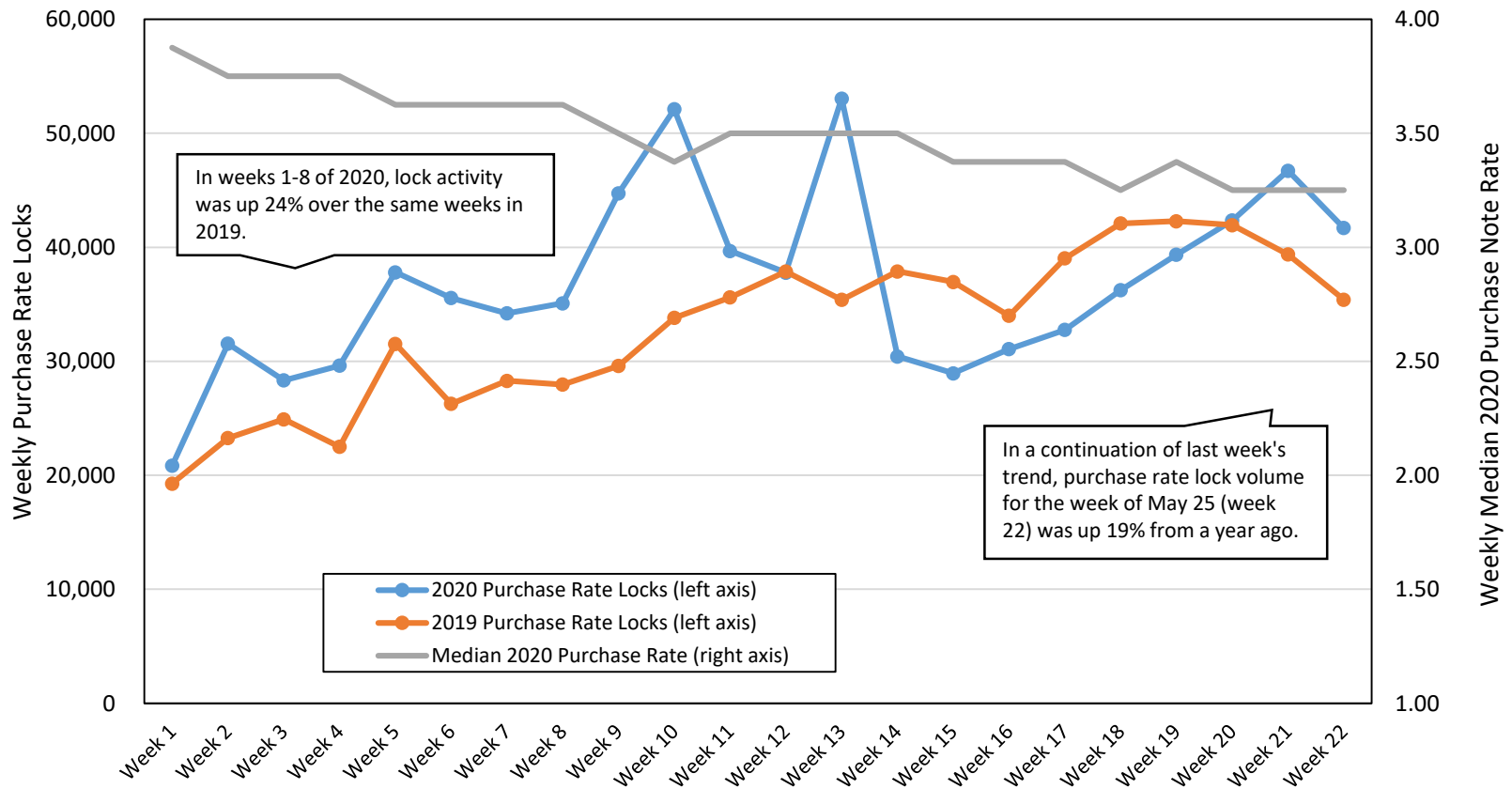
- **Mortgage Risk Index (MRI) – based on 42m purchase & refi loans**
 - MRI is a stress test, similar to a car crash safety rating or hurricane rating for buildings.
 - MRI assesses default risk based on the performance of the 2007 vintage loans with similar characteristics.
 - Goal: Monitor market stability through accurate, real-time tracking of leverage
 - Series begins in September 2012.
 - Data are for government guaranteed loans.
- **Historical MRI – based on 92m purchase loans**
 - Covers a quarter century of mortgage risk
- **Home sales – based on 41m home sales**
 - Data measure home sales for entire nation and include property and borrower level data.
 - Series begins in January 2012.
- **Supply/Demand – based on over 2,200 counties**
 - Data measure months' supply at metro and county level.
 - Series begins in 2013:Q1.
- **New Construction Sales – based on 4.2m new construction sales**
 - Data identify newly constructed home sales.
 - Series begins in January 2012.
- **House Price Appreciation – based on 23m sales of existing homes**
 - Using a “quasi” repeat sales index.
 - Series begins in January 2012.

HMI Key Takeaways

- In a continuation of last week's strong upward trend, purchase rate lock volume for the week of May 25 (week 22) was up 19% from a year ago, providing further evidence that the worst of the near term effects of the COVID-19 pandemic lockdown may be behind us.
 - Purchase rate lock volume is back to its level from before the onset of the pandemic (weeks 1 to 8), when purchase rate lock volume was up 24% on average compared to 2019.
 - Over the past 4 weeks, the market has not only returned to normalcy, but is up substantially from weeks 14-18 when the average weekly year-over-year decline was 15%.
 - As a result of the last two weeks' strong purchase lock volume, combined with strong volume in weeks 1-13, year-to-date volume is now running 12% ahead of last year.
- At the metro level, metros that experienced strong tailwinds before the pandemic are the ones experiencing the same strong tailwinds again.
 - Geographic areas less affected by the pandemic and which are reopening more rapidly will benefit from more favorable economic tailwinds. These are largely metros in the South and Southwest that were already doing well pre-pandemic.
 - Metros in the West, Northeast, and Midwest that take longer to safely reopen will face economic headwinds.
- With the onset of the COVID-19 pandemic, there are changes to the mix of borrowers.
 - The share of borrowers with the highest credit scores now stands at a higher level than before the pandemic.
 - The share of second homes set a new series' high, while the share of investment homes remains low.
 - Tightening of credit standards was both welcome and targeted.
 - Repeat buyers are coming back into the market.
- National home price appreciation (HPA) appears to be back in the 5-6% range, similar to before the pandemic.

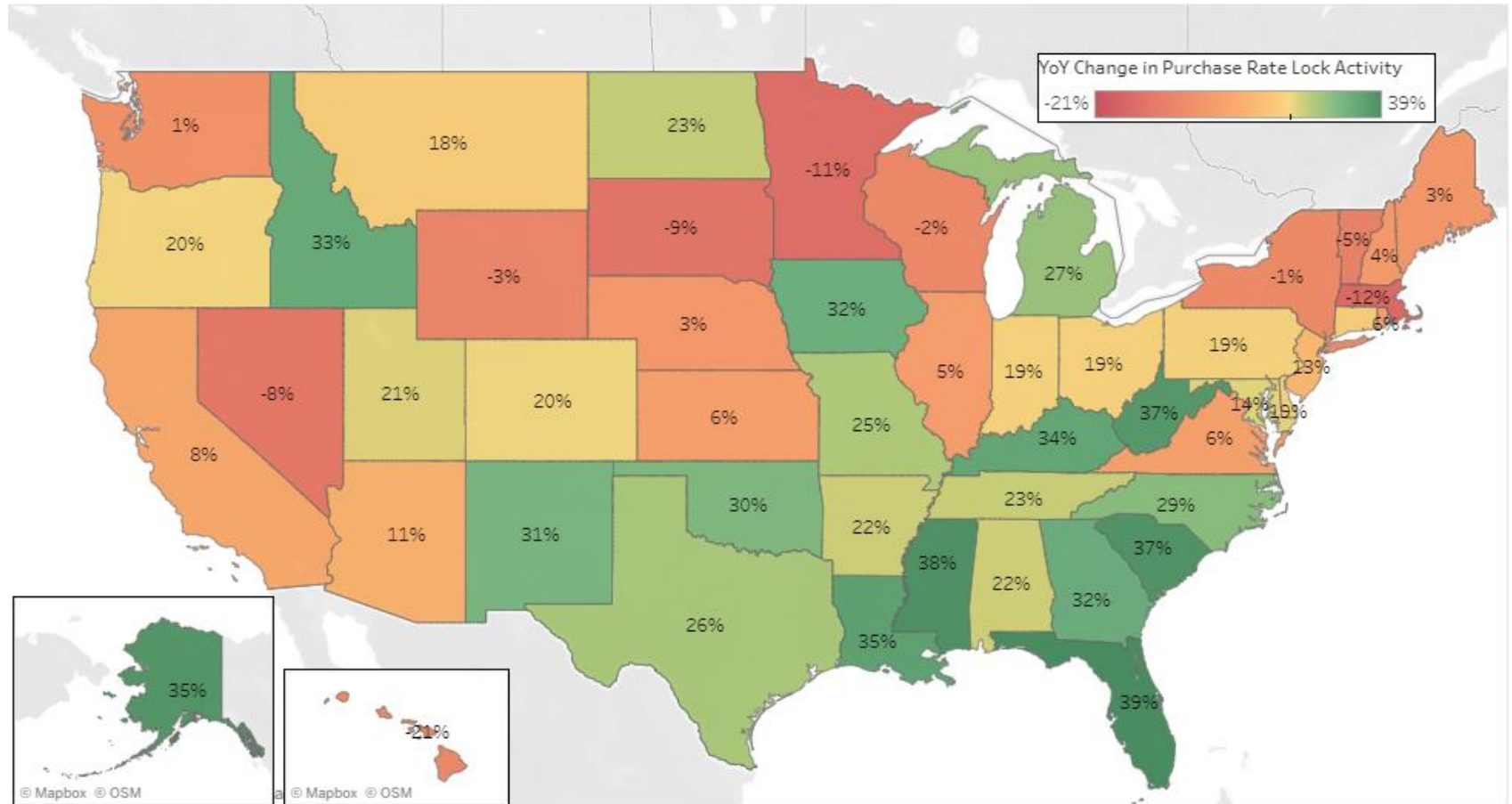
Weekly Purchase Loan Rate Lock Volume

In a continuation of last week's strong upward trend year-over-year, purchase rate lock volume for the week of May 25 (week 22) was up 19% from a year ago, providing further evidence that the worst of the effects of the COVID-19 pandemic lockdown may be behind us. As a result of the last two weeks' strong purchase lock volume, combined with strong volume in weeks 1-13, year-to-date volume is now running 12% ahead of last year.



Y-o-Y Change in State Purchase Rate Lock Activity for Week 22

Rate lock activity for week 22 2020 was up 19% compared to the same week a year ago, although activity varies greatly by state. For week 22, the only three states more than 10% below last year's volume are Massachusetts (down 12%), Hawaii (down 21%), and Minnesota (down 11%). Many Northern and Western states are experiencing headwinds, while Southern and Southwestern states are benefitting from substantial tailwinds.



Note: Yellow is set to 20%.

Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

Purchase Rate Lock Trends by Metro

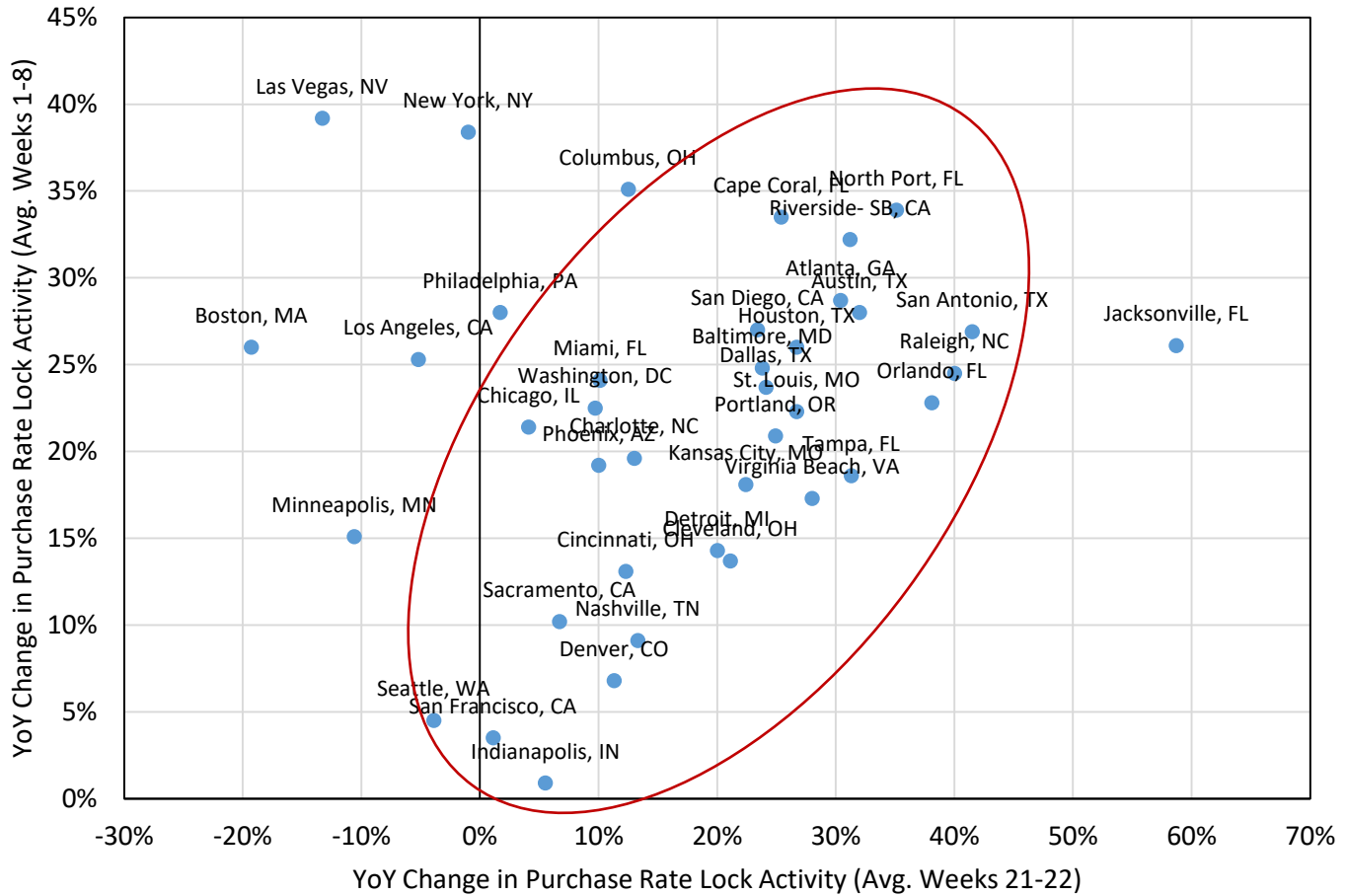
While volume is up 19% from last year nationally, there are important differences in metros. The exceptions appear to be the metros in the Northeast, which may be lagging a bit due to the severe nature of the pandemic there, and Las Vegas, which was particularly hard hit by the decline in travel.

Metros with declines or below-average gains in rate locks	% change in rate locks, week 22: 2019 vs 2020	Metros with above-average gains in rate locks	% change in rate locks, week 22: 2019 vs 2020
Las Vegas, NV	-15%	Nation	19%
Minneapolis, MN	-13%	Dallas, TX	21%
Boston, MA	-13%	Detroit, MI	21%
Los Angeles, CA	-8%	Houston, TX	22%
New York, NY	-6%	Portland, OR	25%
Virginia Beach, VA	-1%	Miami, FL	26%
Seattle, WA	-1%	Riverside-SB, CA	29%
San Francisco, CA	5%	Austin, TX	31%
Philadelphia, PA	6%	St. Louis, MO	32%
Chicago, IL	6%	Baltimore, MD	33%
Washington, DC	7%	Tampa, FL	34%
Indianapolis, IN	8%	Atlanta, GA	36%
San Diego, CA	9%	San Antonio, TX	37%
Cincinnati, OH	9%	North Port, FL	38%
Sacramento, CA	9%	Raleigh, NC	39%
Phoenix, AZ	12%	Orlando, FL	41%
Kansas City, MO	14%	Pittsburgh, PA	54%
Cape Coral, FL	14%	Jacksonville, FL	59%
Charlotte, NC	15%		
Columbus, OH	17%		
Cleveland, OH	18%		
Denver, CO	18%		
Nashville, TN	18%		
Nation	19%		

The table compares the year-over-year change in week 22 purchase rate locks between 2019 and 2020. The data are for the largest 40 metros. Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

Correlation Between Pre- and Post-Crisis Y-o-Y Change in Purchase Rate Lock Activity: 2020

Generally, the metros that experienced strong tailwinds before the pandemic are the ones experiencing the same strong tailwinds again. On the other hand, metros with rather subdued demand before the crisis are lagging behind again.

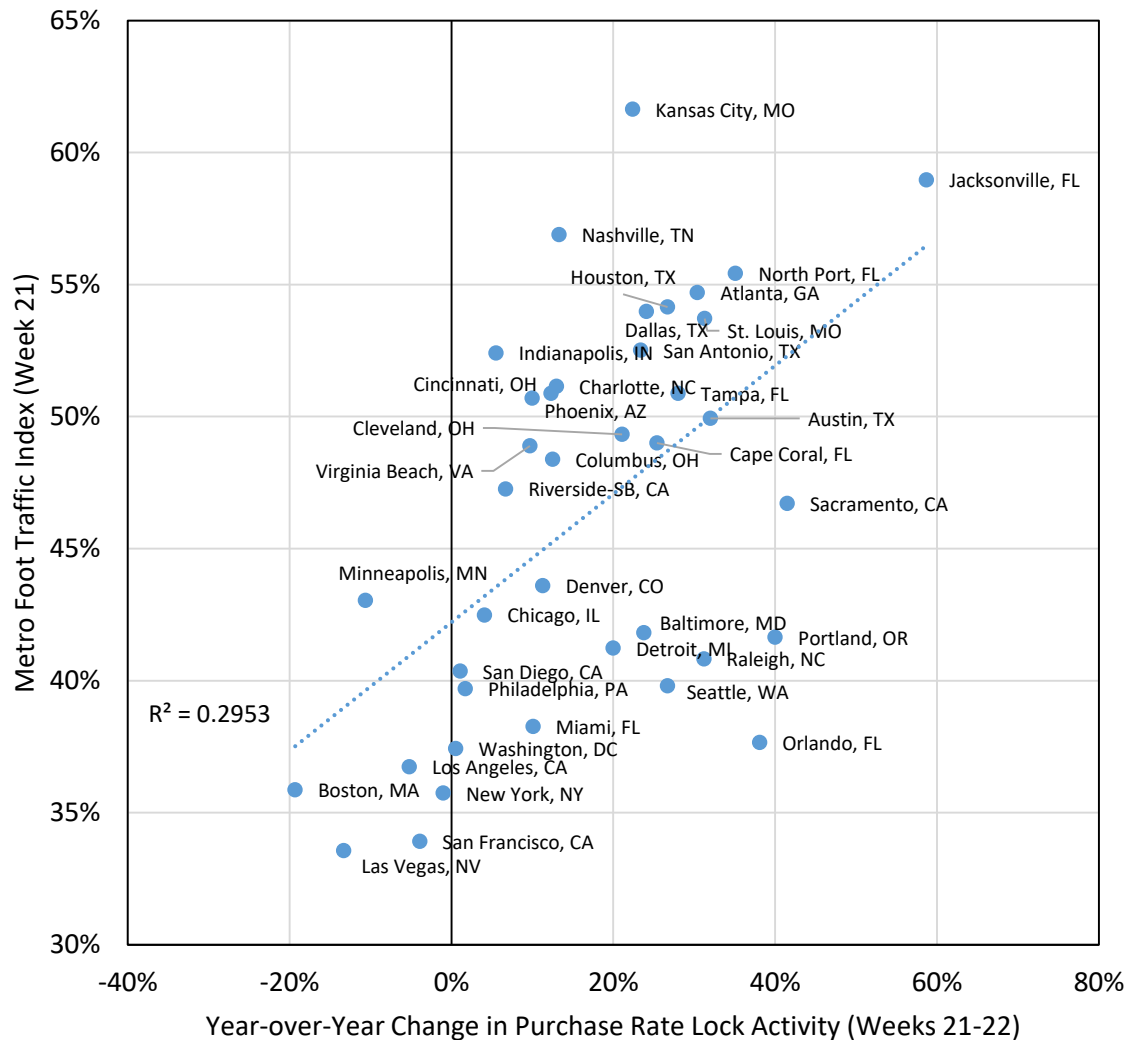


Note: Pittsburgh is omitted due to low purchase rate lock counts.
 Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

Correlation between Foot Traffic and Year-over-Year Change in Purchase Rate Locks Activity: 2020

Metros less affected by the pandemic and that reopen more rapidly will benefit from favorable economic tailwinds. These are largely in the South and Southwest and were already doing well pre-pandemic. While this will likely have a favorable impact on housing demand, home prices may experience unsustainable growth, unless matched by additional supply. Fortunately, these areas tend to benefit additional supply due to looser land use controls.

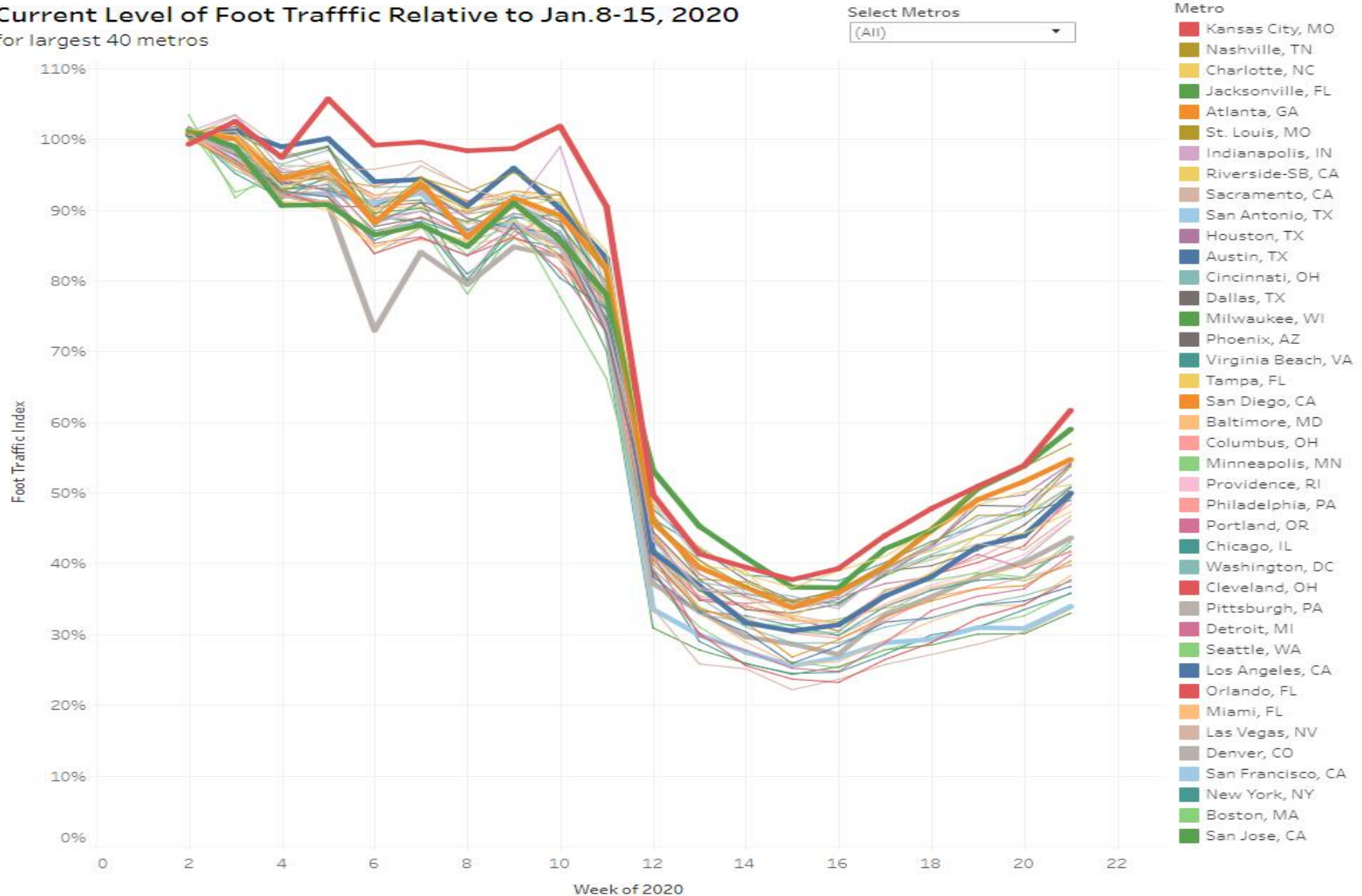
Second, metros in the West, Northeast, and Midwest that take longer to safely reopen will face economic headwinds. This will likely lead to reduced housing demand and, in some areas, more supply as jobs disappear or move elsewhere. Ultimately, this will result in minimal home price appreciation, or even price declines.



Note: Pittsburgh is omitted due to low purchase rate lock counts.

Current Level of Foot Traffic Relative to Jan. 8-15, 2020

Current Level of Foot Traffic Relative to Jan.8-15, 2020
for largest 40 metros



Note: Bold lines correspond to Kansas City, Jacksonville, Atlanta, Austin, Denver, and San Francisco. They rank in the order that they finish in week 21 high to low.

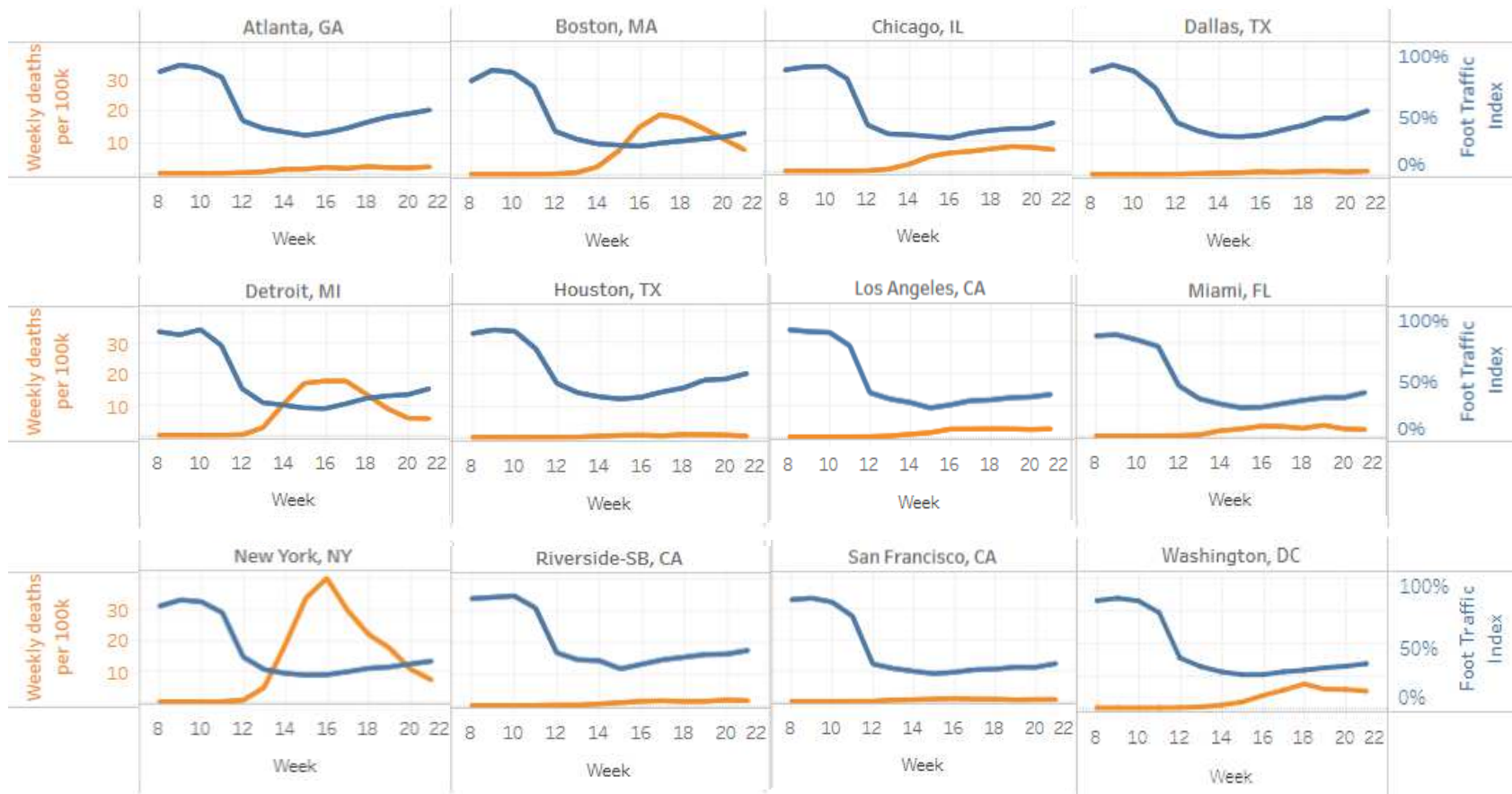
Source: AEI Housing Center, www.AEI.org/housing, and Safegraph.com.

Weekly Deaths per 100,000 and Foot Traffic Index: Metro

The charts for the largest 40 metros, as well as other analysis, are [available on the web](#).

Legend

- Foot traffic index
- Weekly deaths per 100k



Foot Traffic and COVID-19 Indicators for Top 40 Metros

Metro	Week 21, 2020 (5/18 - 5/24)					
	Foot Traffic Indicators			COVID-19 Indicators		
	Current foot traffic index (relative to Jan. 8-15)	Trough in foot traffic index (relative to Jan. 8-15)	Week-over-week progress in foot traffic index	Cumulative cases per 100k (indexed to NYC with 2,276 cases)	Cumulative death per 100k (indexed to NYC at 174 deaths)	New weekly deaths per 100k (coloring based on NYC's 40 in week 16)
Kansas City, MO	62%	38%	27%	10%	5%	0.6
Jacksonville, FL	59%	37%	17%	6%	3%	0.5
Nashville, TN	57%	35%	10%	21%	4%	1.1
Atlanta, GA	55%	34%	9%	14%	8%	2.0
Houston, TX	54%	34%	12%	9%	3%	0.3
Dallas, TX	54%	33%	16%	9%	3%	1.0
St. Louis, MO	54%	34%	19%	14%	14%	3.2
San Antonio, TX	53%	34%	13%	5%	2%	0.2
Indianapolis, IN	52%	34%	11%	29%	25%	4.2
Charlotte, NC	51%	37%	2%	9%	3%	0.5
Tampa, FL	51%	32%	10%	5%	3%	0.9
Cincinnati, OH	51%	34%	11%	10%	6%	1.8
Phoenix, AZ	51%	35%	13%	8%	5%	1.4
Austin, TX	50%	30%	15%	7%	3%	0.4
Milwaukee, WI	50%	34%	15%	19%	11%	1.7
Cleveland, OH	49%	30%	17%	11%	9%	2.2
Virginia Beach, VA	49%	38%	4%	7%	4%	0.8
Columbus, OH	48%	32%	11%	17%	8%	3.9
Riverside-SB, CA	47%	32%	7%	10%	5%	1.5
Sacramento, CA	47%	34%	11%	3%	2%	0.1
Providence, RI	46%	31%	11%	50%	25%	7.3
Pittsburgh, PA	46%	30%	12%	6%	7%	1.4
Denver, CO	44%	27%	7%	22%	17%	3.2
Minneapolis, MN	43%	30%	11%	15%	11%	3.7
Chicago, IL	42%	30%	10%	47%	27%	6.8
Baltimore, MD	42%	32%	4%	26%	17%	4.9
Portland, OR	42%	34%	5%	4%	3%	0.2
Detroit, MI	41%	25%	10%	35%	53%	5.3
San Diego, CA	40%	27%	7%	9%	4%	1.2
Seattle, WA	40%	31%	5%	13%	10%	1.0
Philadelphia, PA	40%	29%	3%	38%	36%	9.0
Miami, FL	38%	26%	8%	20%	11%	2.0
Orlando, FL	38%	23%	7%	5%	2%	0.1
Washington, DC	37%	29%	4%	39%	20%	5.1
Los Angeles, CA	37%	26%	4%	16%	9%	2.5
Boston, MA	36%	25%	6%	60%	51%	7.6
New York, NY	36%	24%	4%	100%	100%	7.0
San Francisco, CA	34%	26%	6%	8%	3%	0.6
Las Vegas, NV	34%	22%	6%	12%	8%	1.5
San Jose, CA	33%	24%	5%	6%	4%	0.2

Coloring cutoff points:

Current level of foot traffic: <40%, <45%, <50%, <55%, <60%, <70%, <80, <90%. BEST

Trough in level of foot traffic: 8 equally sized bins.

Week-over-week progress in foot traffic index: measures the share towards a foot traffic of 90% that was closed during the week; <-2% to >=12% in 2 ppts intervals.

Cumul. cases per 100k (indexed to NYC): <5%, <10%, <15%, <20%, <30%, <40%, <50%, >=50%.

Cumul. death per 100k (indexed to NYC): <5%, <10%, <15%, <20%, <30%, <40%, <50%, >=50%.

New weekly deaths per 100k: <2, <4, <6, <8, <10, <20, <40, >=40. WORST

New weekly deaths are scaled to NYC, which at its worst week had 40 deaths per 100k.

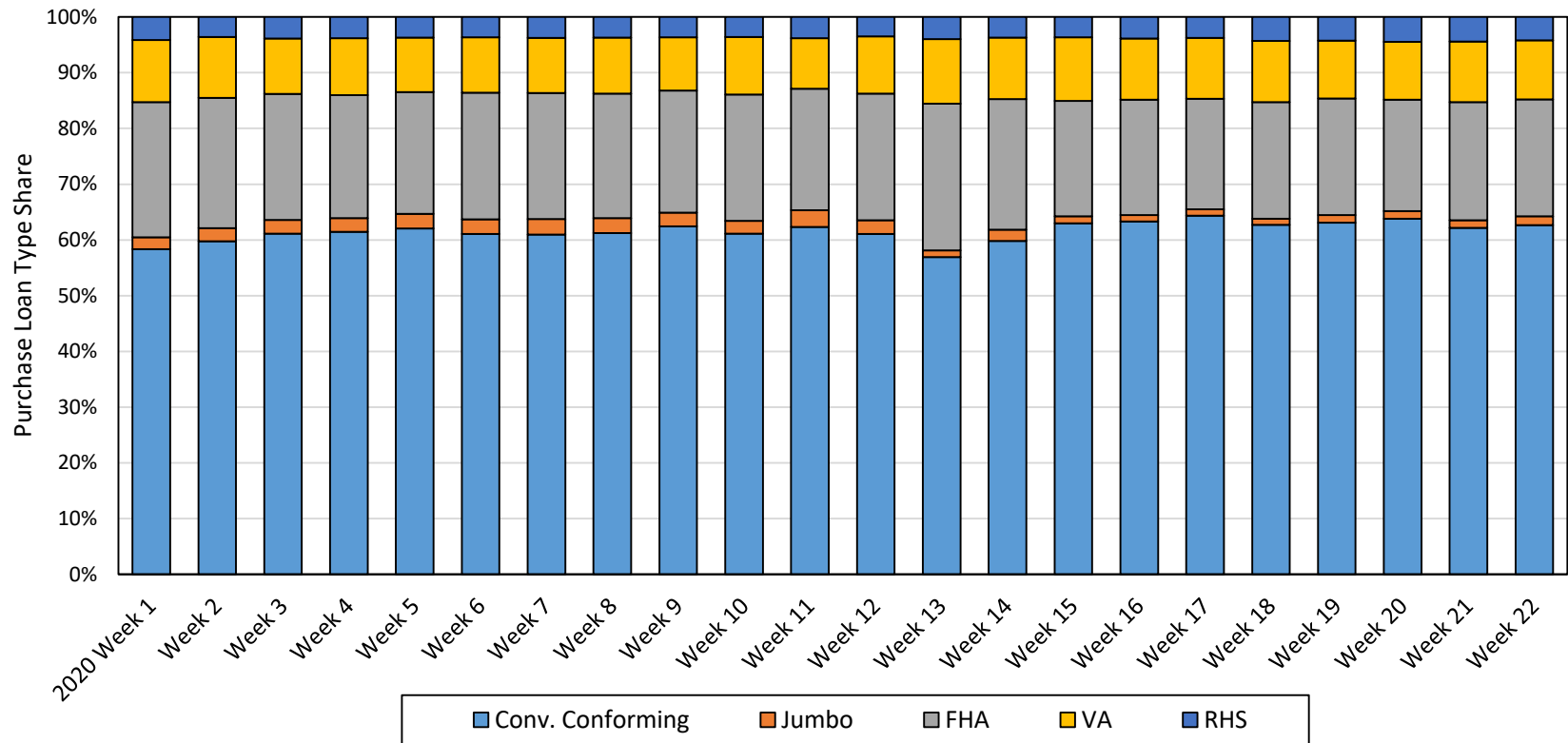
This chart displays changes in 6 metrics for the 40 largest metros.

- **Three are foot traffic indicators:**
 - (i) Current index of foot traffic relative to Jan. 8-15, 2020,
 - (ii) Trough in foot traffic index, and
 - (iii) Week-over-week progress in foot traffic index.
- **Three are COVID-19 Indicators:**
 - (i) Cumulative cases per 100,000 population (indexed to NYC with 2,276 cases/100,000),
 - (ii) Cumulative deaths per 100,000 population (indexed to NYC with 174 deaths/100,000), and
 - (iii) New weekly deaths per 100,000. (note: while deaths lag cases, we have found little correlation between new cases from 2 or 3 weeks ago and new deaths.

The 40 metros are listed in order of the first Foot Traffic Indicator.

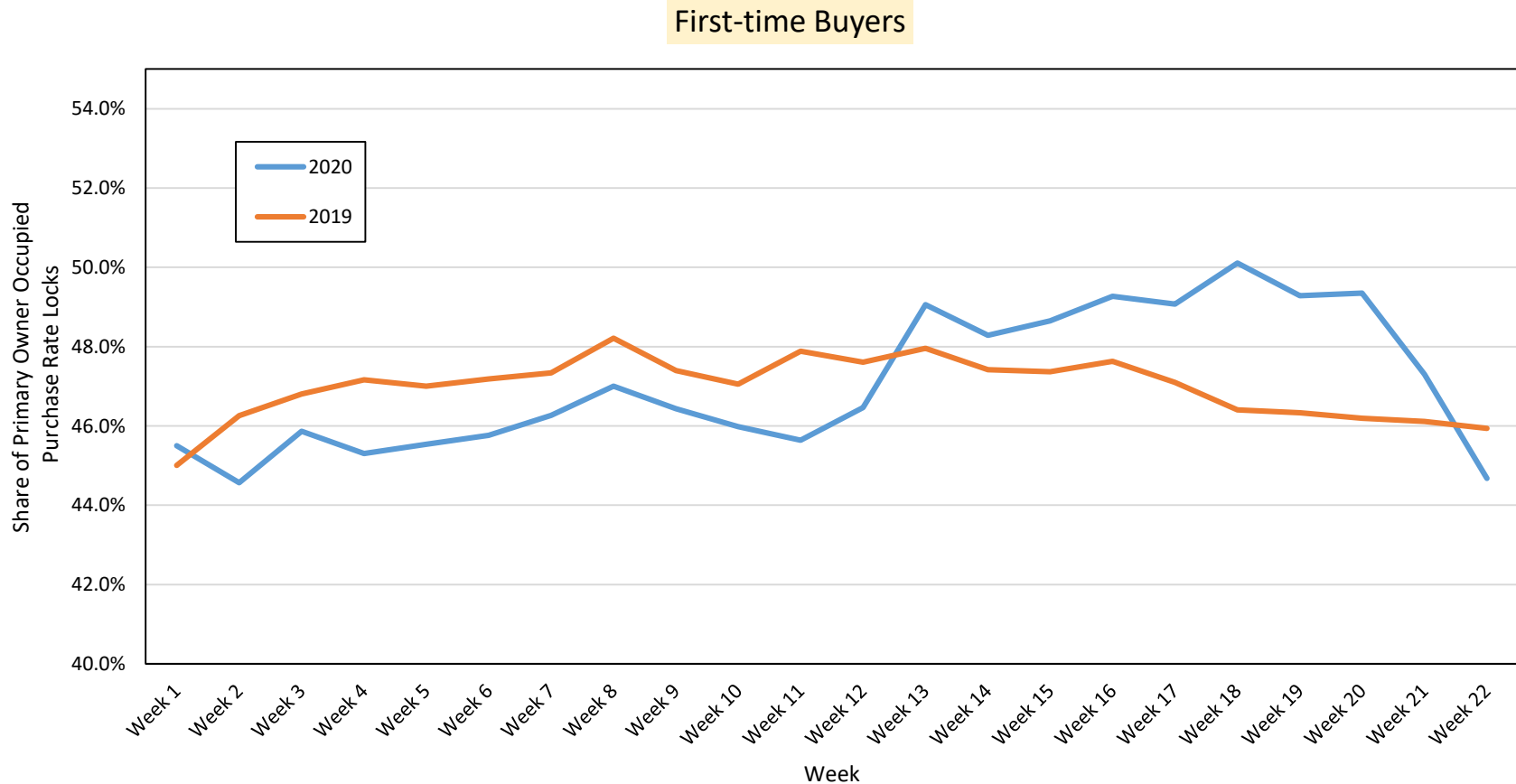
Share of Purchase Rate Locks by Loan Type

For the week of May 25, 2020 (week 22) the conforming share of purchase loan rate locks was 63%, up from an average of 60% during weeks 1-8. The jumbo share of purchase rate locks was 2%, down from an average of 3% from weeks 1-8, but up 1 ppt. from last week. FHA's share is down modestly. It now stands at 21%, down from an average of 23% during weeks 1-8.



First-Time Homebuyer Share of Purchase Rate Locks

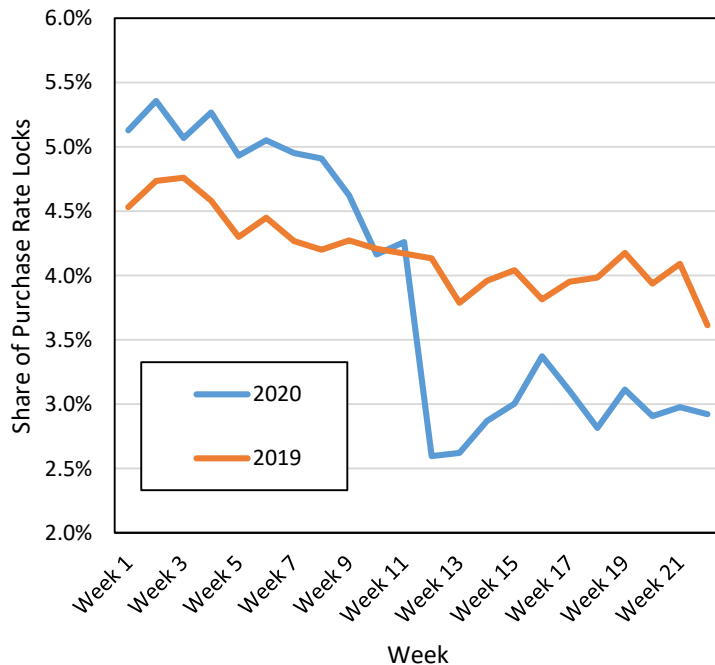
From weeks 13-21 2020, FTBs accounted for a higher share of rate locks than in 2019. In week 22 2020, this trend reverted back to below the 2019 share, and it is similar to the first couple weeks of 2020. The FTB share now stands at 44.7% of primary owner-occupied rate locks, down from a high of 50.1% in week 18, down from 45.9% a year ago, and down from an average of 45.7% before the virus. This means that repeat buyers are returning to the market.



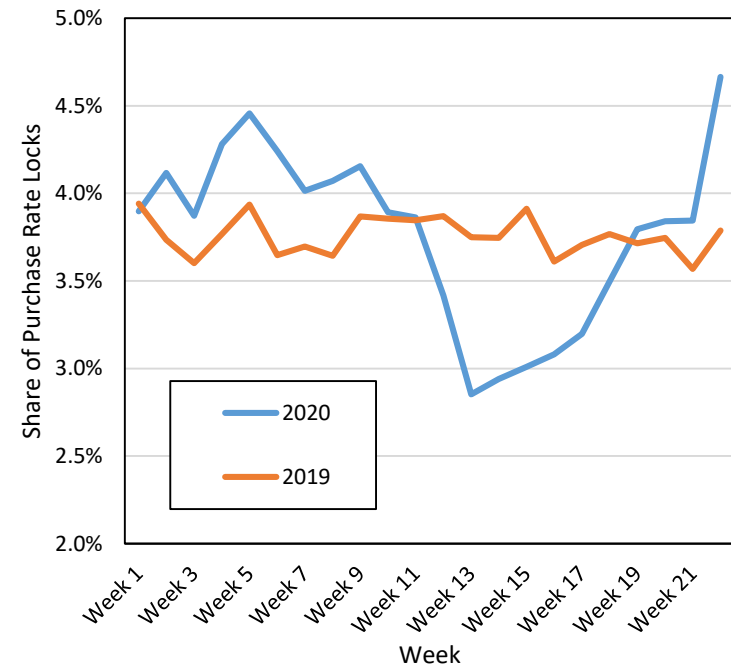
Investor and Second Home Share of Purchase Rate Locks

Investor purchases were off to a strong start in 2020. For weeks 1-8, the investor share was running at around 5.2%, up from 4.5% for the same period in 2019. With the onset of the virus, the investor purchase share has declined quite dramatically. This decline has been even greater for the jumbo segment, where the investor purchase share fell from 2.7% in week 13 to just 0.3% in week 15 (not shown). Interestingly, the share of second home purchase rate locks has initially declined sharply as well. However, since week 13, that share has recovered past its pre-virus level and appears to be making a strong comeback. We will be exploring this trend more in the future.

Investor

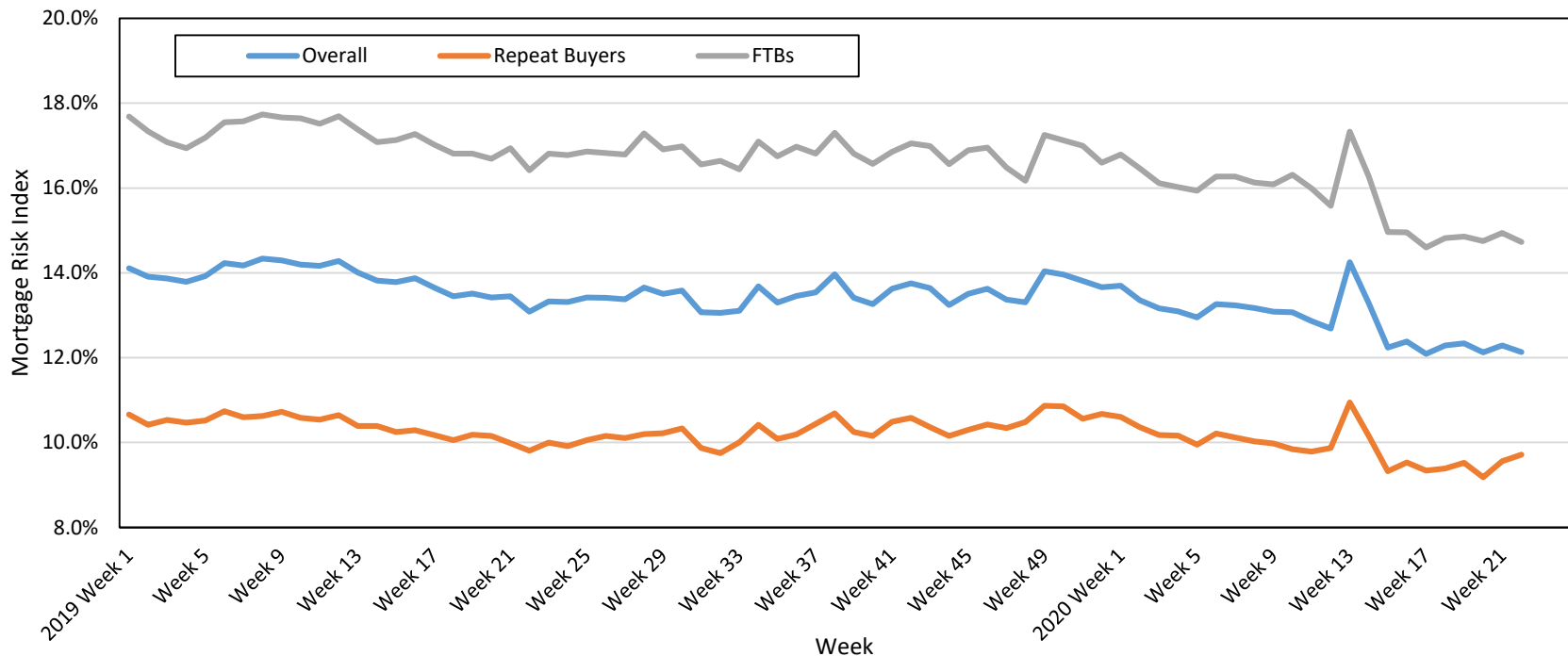


Second Home



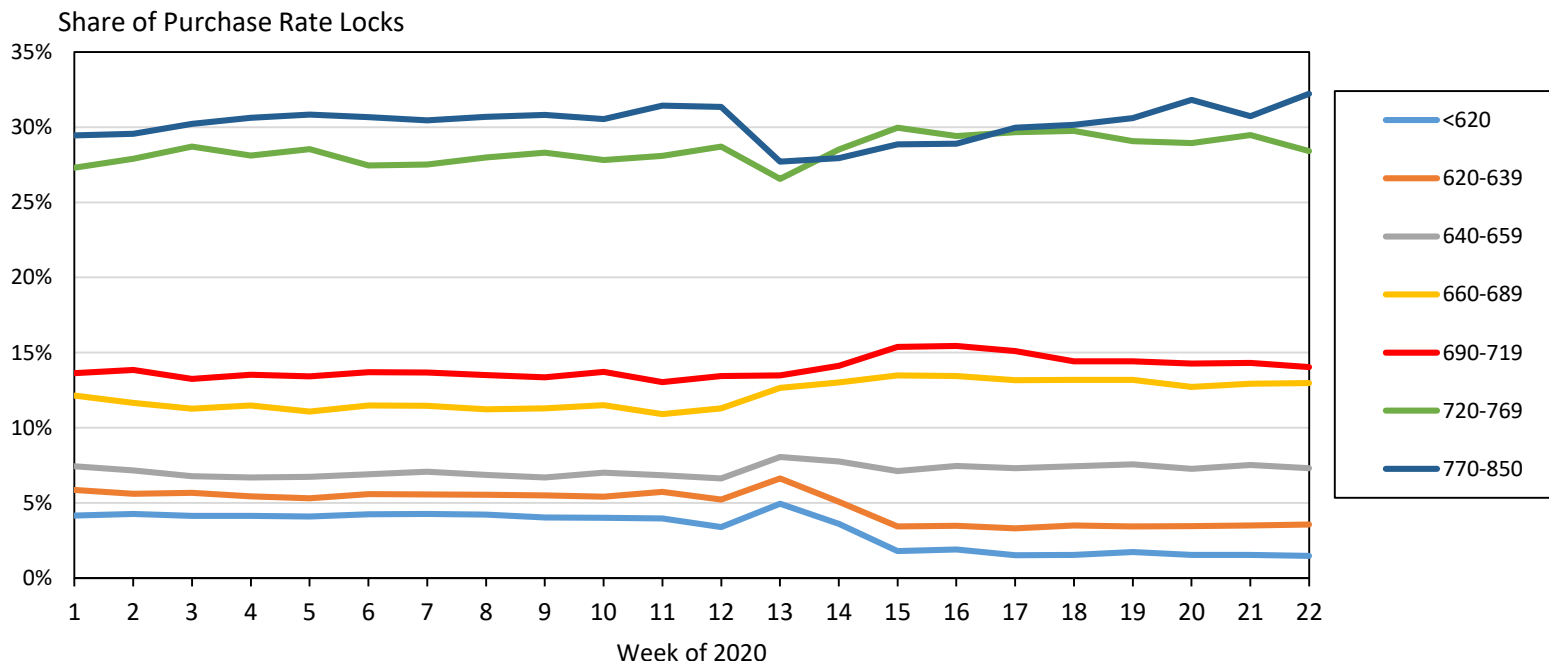
First-Time Homebuyer Mortgage Risk Index

The return of borrowers to the market over the last 4 weeks does not appear to be driven by looser lending standards. For week 22, the purchase rate lock mortgage risk index stood at 11.6%, which is unchanged since week 15. For week 22, the FTB mortgage risk index stood at 14.7%, which is down from an average of 16.3% pre-virus (weeks 1-8). This tightening of credit standards was both welcome and targeted. For repeat buyers, the index tightened at about a similar rate, although credit has eased slightly in the past week compared to FTBs. Lastly, the spike in week 13 is due to a temporary surge in FHA rate locks, which are on average much riskier than other loan types.



Purchase Rate Locks by Credit Score Bin

The highest quality borrowers have returned to the market. The share of borrowers with a FICO score of 770+ had initially decreased from 31% to 28%, but this share has recovered to 32% over the past several weeks. With the onset of the COVID-19 pandemic, borrowers with the lowest FICO score are less able to get mortgages as lenders tighten up lending standards. The share of borrowers with a score below 640 has fallen from 10% to 5%. This tightening of lending standards is appropriate since the most leveraged borrowers tend to purchase late in a housing boom and are then likely to be among the first to default. The drop in borrowers with credit scores below 640 is almost entirely limited to FHA and VA. The credit score bin shares for other loan types are virtually unchanged in week 22 compared with early in 2020.



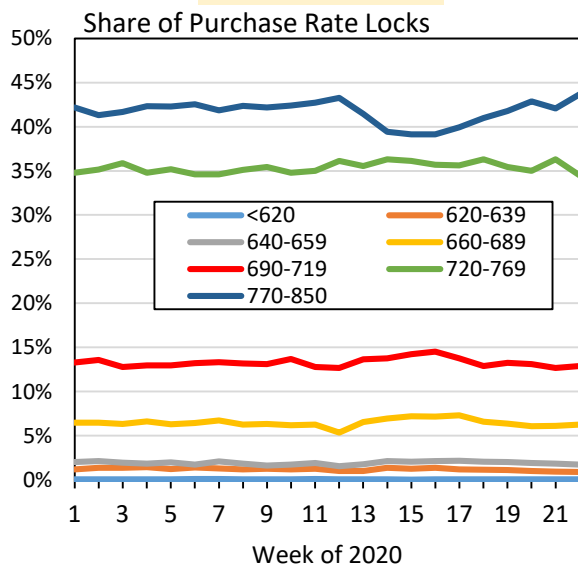
Purchase Rate Locks by Credit Score Bin and Loan Type

Conforming: Among conforming borrowers, the share of borrowers with a FICO score of 770+ has recovered from its initial decline and now stands at 44%, while the share of borrowers with scores below 720 has held steady at 22%.

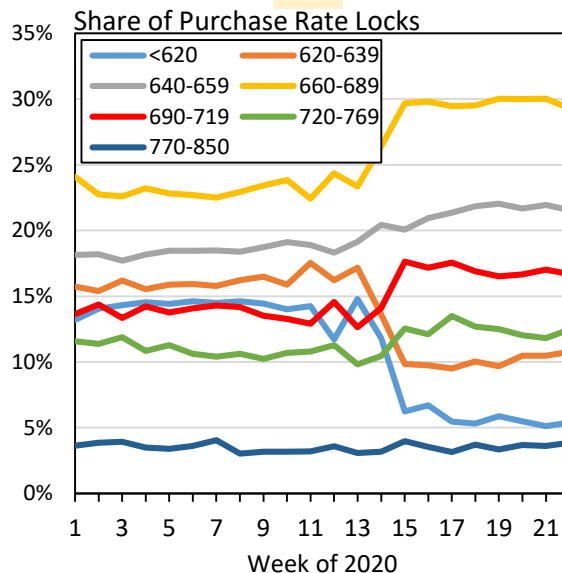
FHA: The share of FHA borrowers with a credit score below 640 has halved from 32% to just 16%, while the share of borrowers with a FICO of 660-689 has increased from 23% to 29%.

VA: The share of VA borrowers with a credit score below 640 has halved from 16% to just 8%. Again, this tightening is welcome news since the most leveraged borrowers tend to purchase late in a housing boom and then default first.

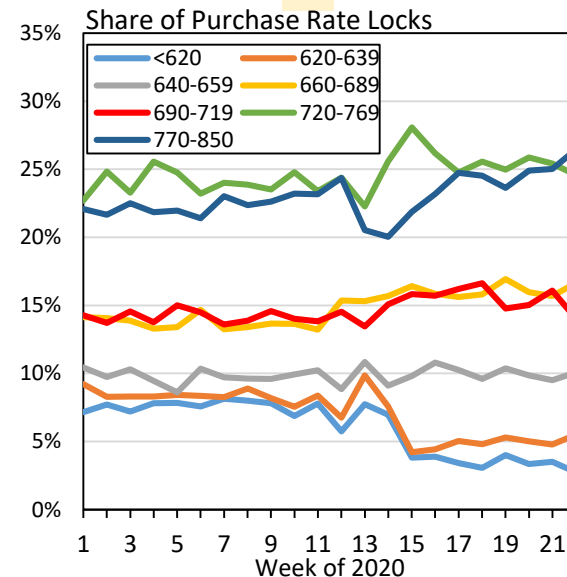
Conv. Conforming



FHA



VA



Purchase Loan Credit Indicators by Loan Type

Indicators for Week 22 of 2020 show that credit availability has generally tightened compared to Week 8 of 2020 (the last “normal” pre-coronavirus crisis week) and Week 22 of 2019. FHA exhibited the largest amount of tightening. Compared to Week 8 of 2020, its credit scores rose 11.5 points, its DTIs fell 0.6 ppts, while its LTVs remained relatively unchanged. This translated into a 2.6 ppts. decrease in FHA’s risk index. The tightening is even larger when compared to the same week in 2019 and is welcome news since the most leveraged borrowers tend to purchase late in a housing boom and then default first. Credit standards also tightened for VA and Rural Housing Services (RHS). They remained the same for jumbo loans, whereas they eased slightly for conforming loans compared to Week 8 of 2020, and tightened somewhat compared to Week 22 of 2019.

	Credit Score		LTV		DTI		MRI	
	Change (in points) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to	
	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22
Conv. conforming	1.5	3.4	1.1	1.1	-0.6	-1.3	0.1	-0.2
Jumbo	2.6	3.3	1.2	1.5	-2.4	-2.6	0.0	0.0
FHA	11.5	13.1	0.2	0.5	-0.6	-0.9	-2.6	-2.9
VA	11.4	12.4	0.0	0.6	-1.1	-1.4	-1.5	-1.5
RHS	6.0	6.7	0.0	-0.2	0.2	-0.1	-1.3	-1.5

Note: The most recent week is compared to the same week a year ago and to week 8 in 2020 (Feb. 16 – Feb. 22 2020). Week 8 2020 is benchmark for the housing market before the COVID-19 pandemic and is roughly representative of the first 10 weeks in 2020. A positive number implies that scores have increased for the most recent week relative to the prior week/year. Conventional conforming rate locks have a loan amount at or below the applicable GSE loan limit (including the super conforming loan limit), while jumbo loans have loan amounts above the applicable GSE loan limit. The table reports changes in metrics because of level differences between the Optimal Blue rate lock data and the National Mortgage Risk Index (NMRI) data. Unlike levels, the trends between both datasets line up very closely.

Cash-out Refinance: Rate Locks and Loan Amount

For the week of May 25, 2020 (week 22) cash-out rate lock activity was 9% above that for week 8 in 2020, and 64% above week 22 in 2019. Cash-out refinance rate lock volume is generally more volatile due to changes in mortgage rates. The cash-out amount for the week of May 25, 2020 (week 22) averaged \$48,400 and ranged from \$34,600-\$123,800 depending on the loan type. Tracking trends in cash-out rate locks and cash-out amounts becomes increasingly important during times such as today, when home values are undergoing rapid changes and interior inspections are hard to do.

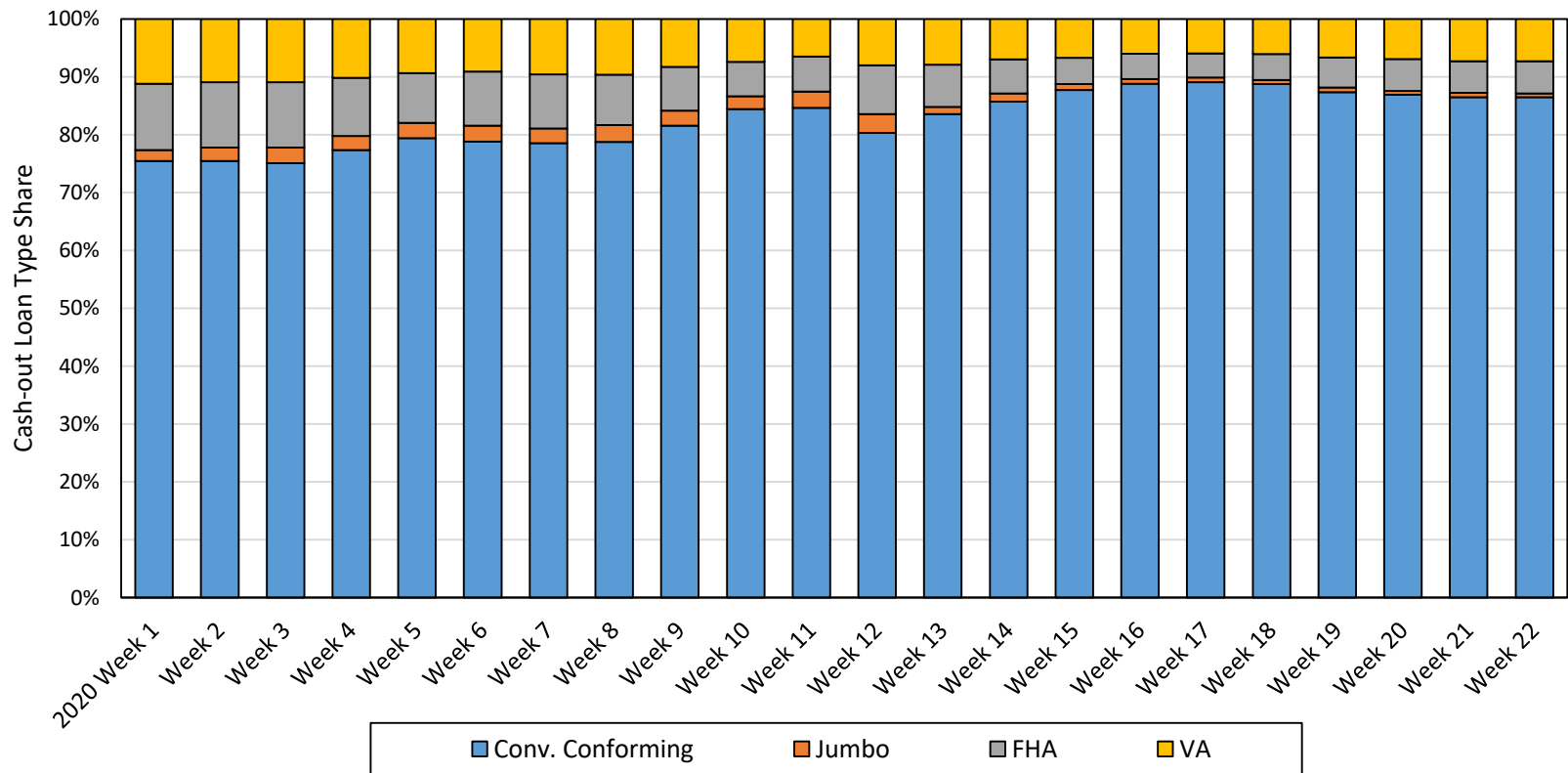
	% Change in Rate Locks 2020 Week 22		Rate Locks Share by Loan Type			Average Cash-out Amount (rounded to nearest \$100)
	2020 Week 8	2019 Week 22	2020 Week 22	2020 Week 8	2019 Week 22	2020 Week 22
Overall	9%	64%				\$48,400
Conv. conforming	20%	120%	86%	79%	65%	\$49,800
Jumbo	-77%	-59%	1%	3%	3%	\$123,800
FHA	-30%	-49%	6%	9%	18%	\$34,600
VA	-17%	-19%	7%	10%	15%	\$40,200

Note: These issues further compound the risks of cash-out refinances, which suffer from information asymmetry (the borrower knows more than the lender, who in turn knows more than the guarantor) and a weak appraisal process.

Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

Cash-out Refinance: Rate Locks by Loan Type

Since the beginning of the year, the conforming share of cash-out refinances has increased from 75% to 86%. At the beginning of 2019, the conforming share was just 61%. Over the same period, the share of jumbo rate locks has almost completely vanished. The combined share of FHA and VA has fallen from 23% to just 13%.



Cash-out Refinance: Credit Indicators

Credit standards have recently tightened for cash-out refinances. However, some tightening is common when volume increases due to higher quality borrowers entering the market.

	Credit Score		LTV		DTI		MRI	
	Change (in points) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to	
	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22
Conv. conforming	13.3	19.5	-1.7	-1.5	-1.6	-2.4	-2.4	-3.4
Jumbo	5.3	8.2	0.0	0.2	-0.9	-2.5	-0.9	-1.5
FHA	23.7	12.2	0.6	-5.3	-2.2	-2.8	-3.1	-5.8
VA	21.8	34.9	-2.1	-9.8	-3.7	-5.1	-3.7	-6.7

Note: The most recent week is compared to the same week a year ago and to week 8 in 2020 (Feb. 16 – Feb. 22 2020). Week 8 2020 is benchmark for the housing market before the COVID-19 pandemic and is roughly representative of the first 10 weeks in 2020. A positive number implies that scores have increased for the most recent week relative to the prior week/year. Conventional conforming rate locks have a loan amount at or below the applicable GSE loan limit (including the super conforming loan limit), while jumbo loans have loan amounts above the applicable GSE loan limit. The table reports changes in metrics because of level differences between the Optimal Blue rate lock data and the National Mortgage Risk Index (NMRI) data. Unlike levels, the trends between both datasets line up very closely.

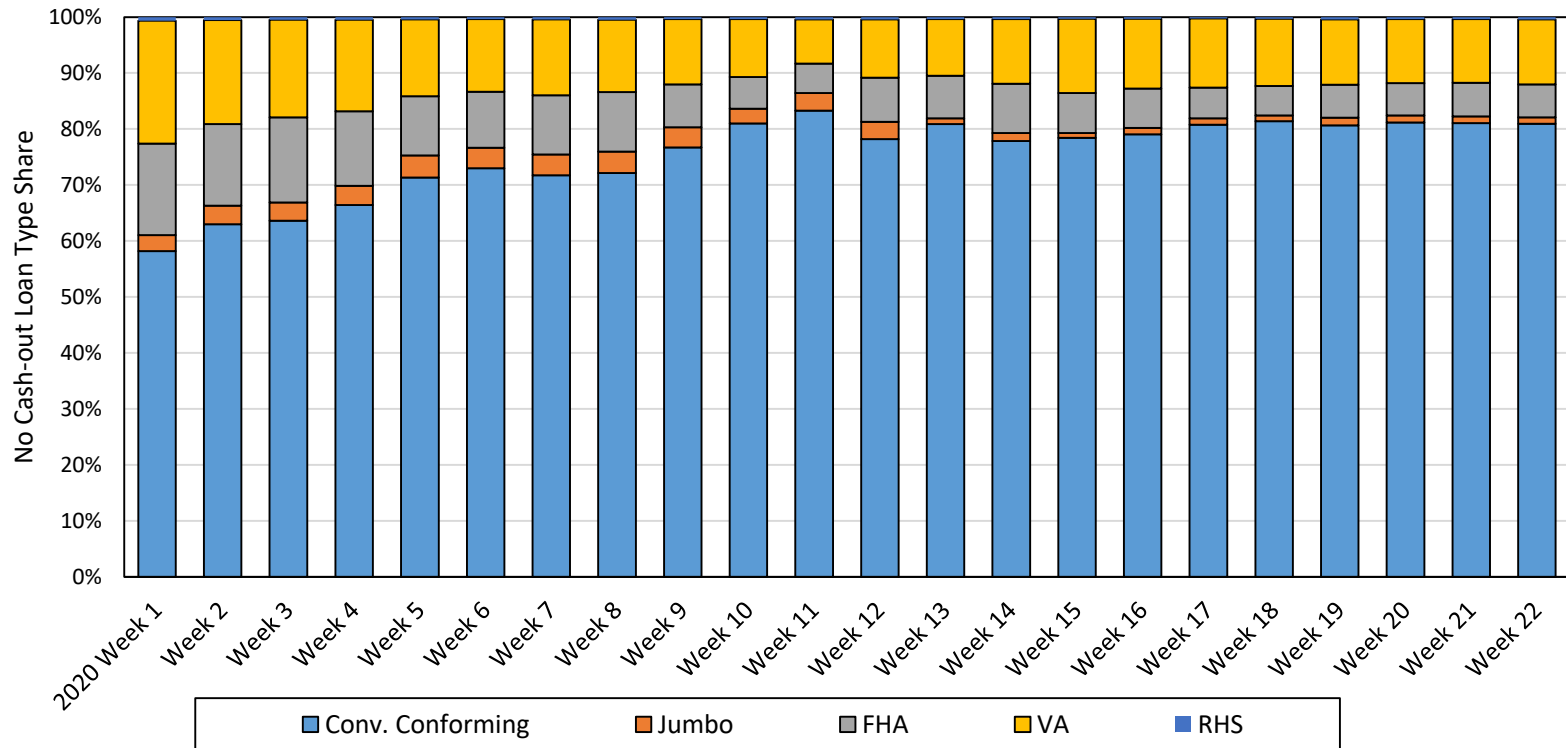
No Cash-out Refinance: Rate Locks

For the week of May 25, 2020 (week 22) no cash-out rate lock activity was 57% above that for week 8 in 2020, and 310% above week 22 in 2019. No cash-out refinance rate lock volume is generally more volatile due to changes in mortgage rates.

	% Change in Rate Locks 2020 Week 22		Rate Locks Share by Loan Type		
	2020 Week 8	2019 Week 22	2020 Week 22	2020 Week 8	2019 Week 22
Overall	57%	310%			
Conv. conforming	76%	449%	81%	72%	60%
Jumbo	-52%	-20%	1%	4%	6%
FHA	-14%	55%	6%	11%	16%
VA	41%	167%	12%	13%	18%

No Cash-out Refinance: Rate Locks by Loan Type

For the week of May 25, 2020 (week 22), the jumbo share of no cash-out refinances is near 0%, down from an average of 4% for the first 8 weeks of 2020. The FHA share has declined from the start of the year and stands now at 6%. The VA share has also declined in recent weeks and now stands at 12%. The conventional conforming share is now above 81%, well above its share of 58% early in 2020.



No Cash-out Refinance: Rate Locks Credit Indicators

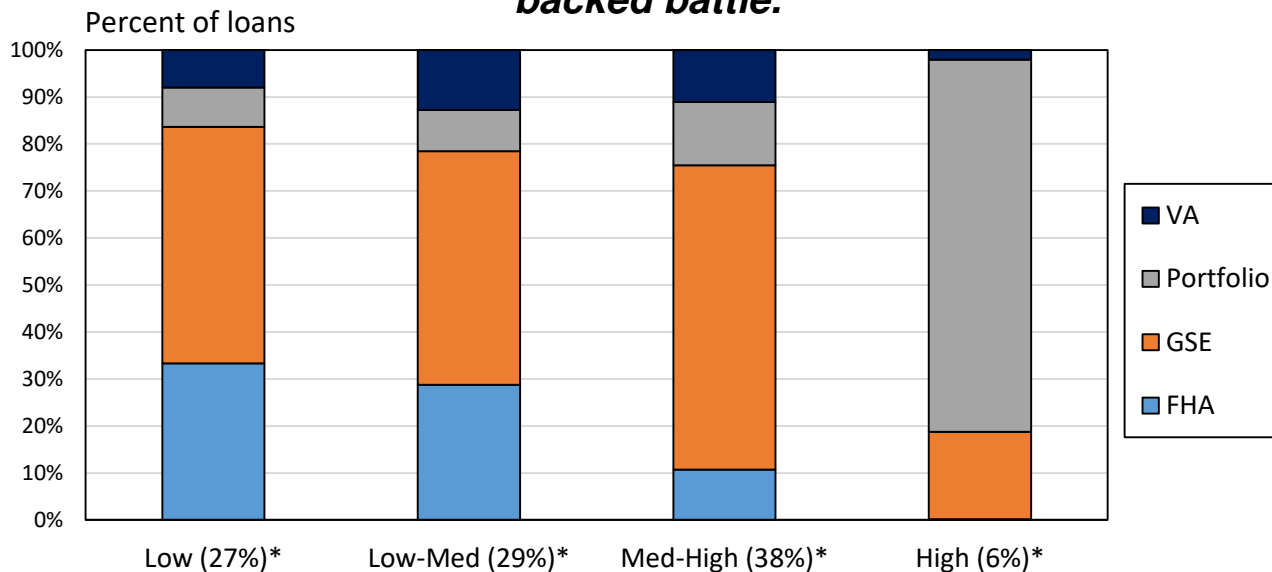
Indicators for the week of May 25, 2020 show that credit availability tightened for conventional conforming, FHA, and VA compared to 2020 Week 8 and 2019 Week 22.

	Credit Score		LTV		DTI		MRI	
	Change (in points) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to		Change (in ppts.) 2020 Week 22 to	
	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22	2020 Week 8	2019 Week 22
Conv. conforming	7.3	15.2	-3.4	-4.6	-1.5	-3.0	-1.6	-3.1
Jumbo	4.4	8.1	-4.0	-5.3	-2.5	-4.7	-1.3	-1.9
FHA	5.2	-0.1	-1.2	-0.4	0.7	-1.7	-1.1	-1.8
VA	23.5	39.6	-2.3	-5.2	-0.8	-2.1	-2.6	-4.9
RHS	22.9	1.2	-3.5	0.9	-2.8	-0.2	-4.3	-0.7

Note: The most recent week is compared to the same week a year ago and to week 8 in 2020 (Feb. 16 – Feb. 22 2020). Week 8 2020 is benchmark for the housing market before the COVID-19 pandemic and is roughly representative of the first 10 weeks in 2020. A positive number implies that scores have increased for the most recent week relative to the prior week/year. Conventional conforming rate locks have a loan amount at or below the applicable GSE loan limit (including the super conforming loan limit), while jumbo loans have loan amounts above the applicable GSE loan limit. The table reports changes in metrics because of level differences between the Optimal Blue rate lock data and the National Mortgage Risk Index (NMRI) data. Unlike levels, the trends between both datasets line up very closely.

Market Shares by Guarantor Type and Price Tier: 2019 Purchase Loans

To better track house price trends, we divide the market into 4 leverage-based price tiers. In the low and low-medium price tiers, FHA accounts for over a quarter share in each, while together FHA and the GSEs have a combined share of around 80%. The battle for market share between FHA and the GSEs is therefore largely taking place in these price tiers. Unsustainable constant-quality house price increases are the unfortunate consequence of this tax-payer backed battle.



2019	Price Tier			
	Entry-level		Move-up	
	Low	Low-Med	Med-High	High
Mortgage Risk Index	15.5%	14.3%	8.9%	3.1%
Market Share*	27%	29%	38%	6%

*Market share of all institutionally financed home sales in 2019 by tier.

Note: Data excludes Rural Housing Service. In 2017, Rural Housing Service loans made up 3% of the low tier, 2% of the low-medium tier, and a negligible amount of the two upper tiers.

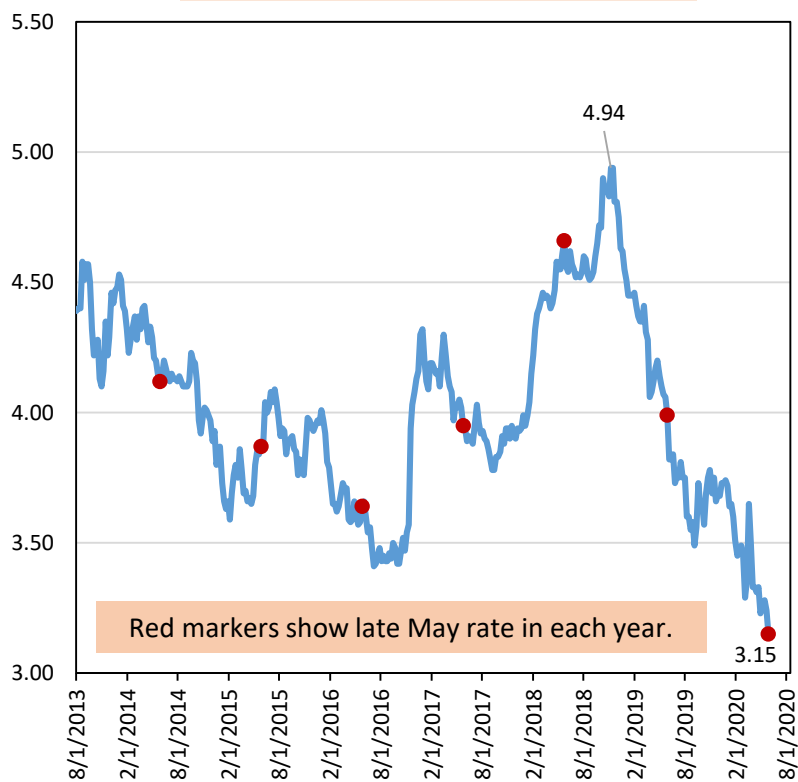
Price tiers are set at the metro level and are defined as follows: Low: all sales at or below the 40th percentile of FHA sales prices; Low-Medium: all sales at or below the 80th percentile of FHA sales prices; Medium-High: all sales at or below the 125% of the GSE loan limit; and High: all other sales.

Source: AEI Housing Center, www.AEI.org/housing.

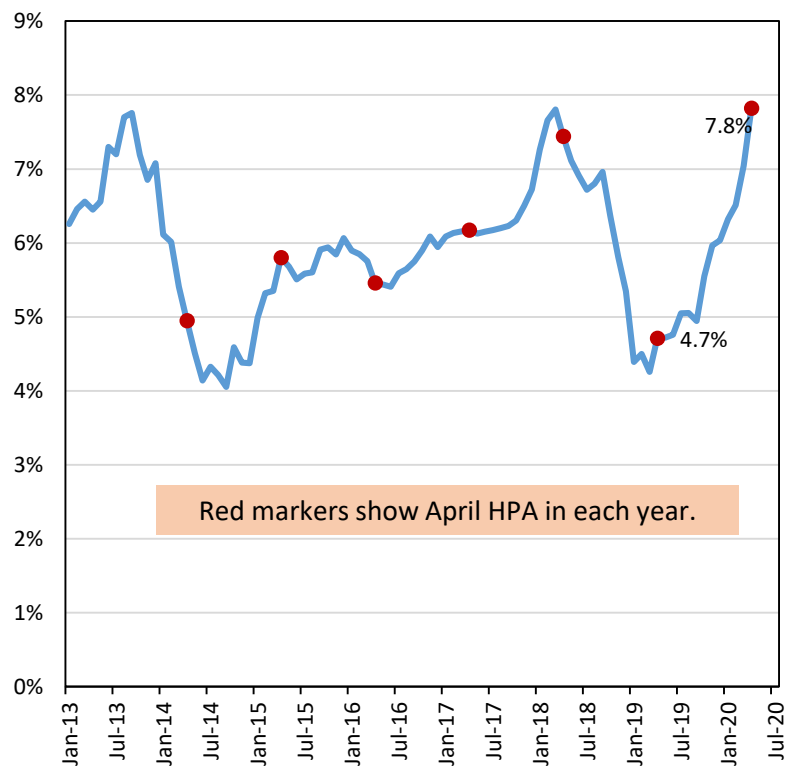
Dovish Fed = Monetary Punchbowl Getting Spiked Again

The national rate of HPA for April 2020 was 7.8%. This is preliminary due to COVID-19 related reporting delays and may be revised when all county records have been updated. HPA is up from 6.5% in February 2020 and up from 4.7% in April 2019. Nationally, HPA has ticked up again due to lower mortgage rates, which after having increased by 116 basis points from September 2017 to early November 2018, have since declined by 179 basis points.

30-year Fixed Rate Mortgage



Year-over-Year Rate of House Price Appreciation



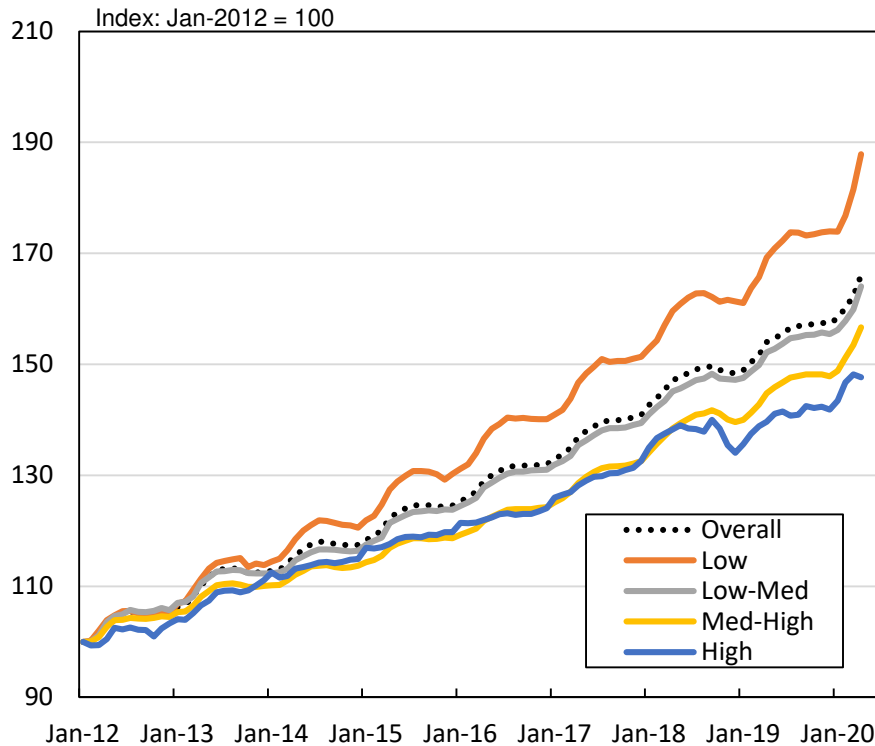
Note: Data are for 30-year fixed-rate prime conventional conforming home purchase mortgages with a loan-to-value of 80 percent.
Source: Freddie Mac.

Note: Data are for the entire country. Data for April 2020 are preliminary. Due to updates in our HPA methodology, we have revised our previous estimates.
Source: AEI Housing Center, www.AEI.org/housing.

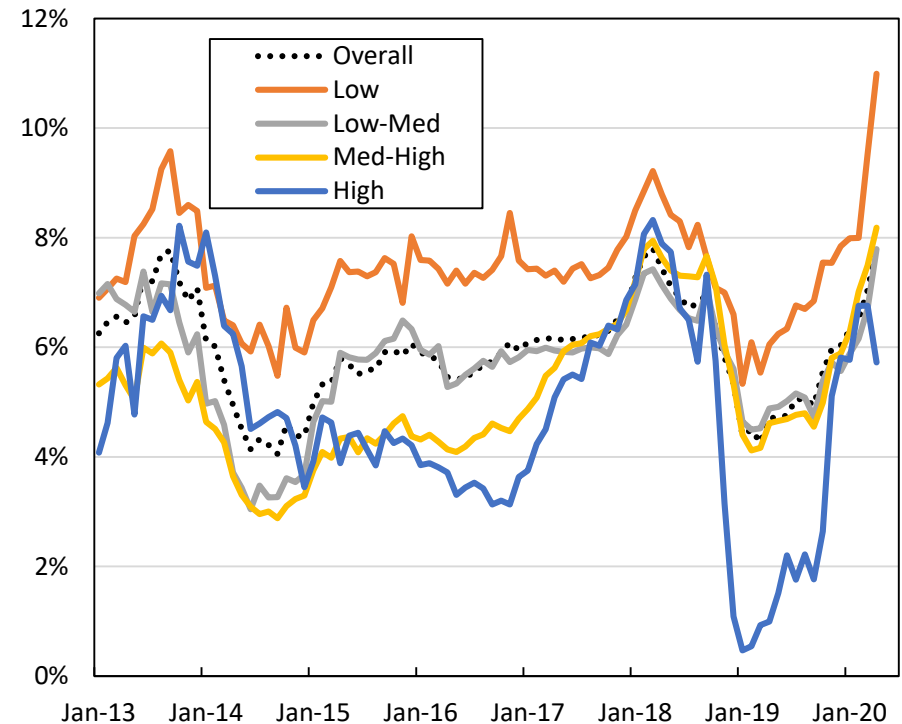
National House Price Appreciation (HPA) by Price Tier

Preliminary numbers for April 2020 indicate that overheating of the low price tier continued (right panel). HPA in the low price tier was 11% year-over-year. HPA in the high tier (about 7% share) increased significantly to 5.7% compared to 1% a year ago. These results are preliminary due to COVID-19 related reporting delays and may be revised when all county records have been updated.

Home Price Appreciation by Price Tier



Year-over-Year Home Price Appreciation by Price Tier



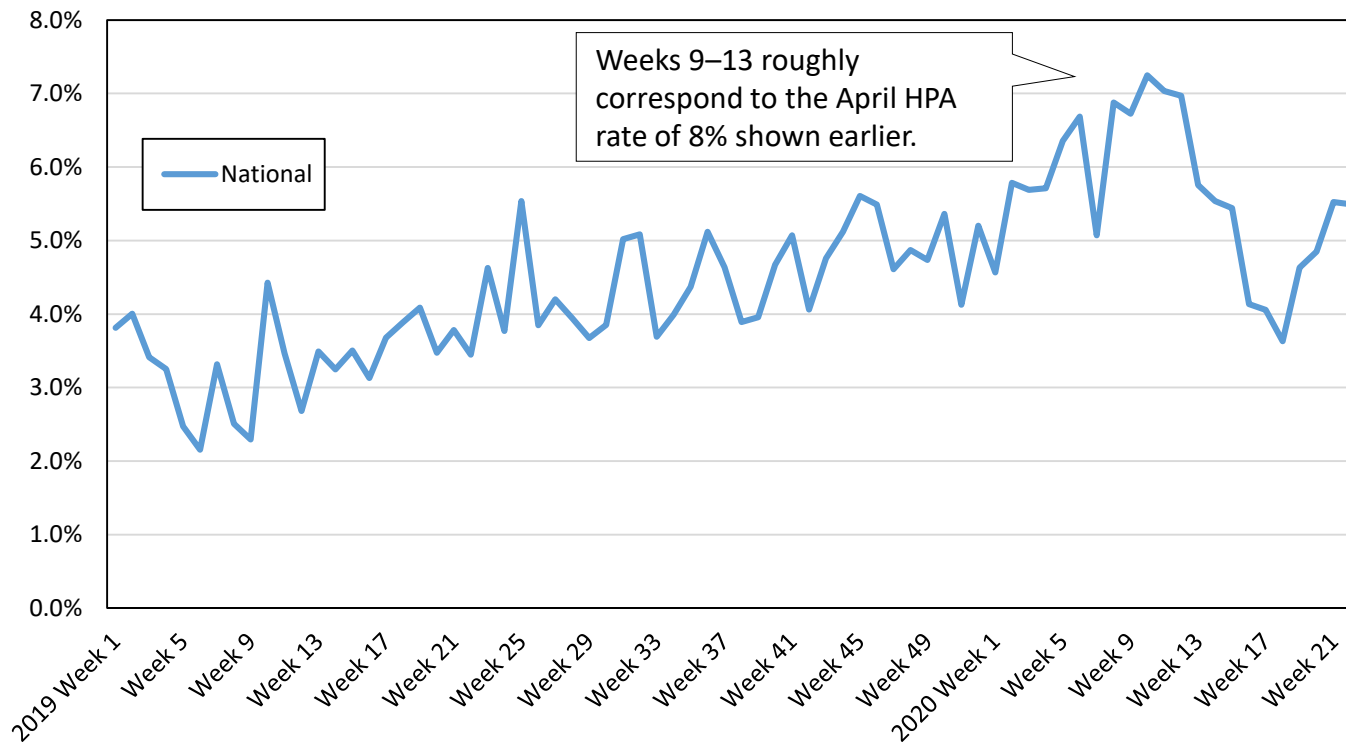
Note: Data for April 2020 are preliminary. Price tiers are set at the metro level and are defined as follows: Low: all sales at or below the 40th percentile of FHA sales prices; Low-Medium: all sales at or below the 80th percentile of FHA sales prices; Medium-High: all sales at or below the 125% of the GSE loan limit; and High: all other sales. HPAs are smoothed around the times of FHFA loan limit changes.

Due to updates in our HPA methodology, we have revised our previous estimates.

Source: AEI Housing Center, www.AEI.org/housing.

Nowcast House Price Appreciation Using Rate Lock Data

Using Optimal Blue data, national HPA remains in the 5-6% range in late May, continuing a recovery that started in week 19. Optimal Blue data indicate that the rate of national HPA for week 22 stood at 5.5%, down from 7.2% during week 10 but up from 3.6% in week 18. Throughout 2019 and 2020 (until early March), the rate of HPA continued to strengthen and reached a high of 7.2% yoy for the week of March 1, 2020 (week 10). Then the index reverses and quickly decelerates, reaching a low of 3.6% yoy for the week of April 27, 2020 (week 18).



Note: Based on purchase price estimates from rate lock data and their geographic location, we construct a weekly home price appreciation index. The index estimates an average weekly sale price controlling for location at the ZIP code level. For more on the methodology, please see the appendix. Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

Remaining Briefing Dates for 2020

- Our next HMI briefing is on Wednesday, July 1.
- The remaining briefings for 2020 are listed below:

Wednesday	July 1
Wednesday	July 29
	<i>No briefing in August</i>
Wednesday	September 30
Monday	October 26
Monday	November 23
Tuesday	January 5, 2021

All briefings take place at 11 AM ET.

If you know someone not on our regular distribution list and who would like to be added to it, please send the name and email address to Michael.Howard@AEI.org.

Methodology

National Mortgage Risk Index (NMRI): A Quick Primer

- Overall goal:
 - Monitor market stability through accurate, real-time tracking of leverage that, if left unchecked, would result in destructive housing booms/busts.
- Principles behind the NMRI
 - NMRI is a stress test, similar to a car crash safety rating or hurricane rating for buildings.
 - The NMRI's stress event is the financial crisis from 2007.
- Basics of index construction
 - The NMRI is a standardized quantitative index for mortgage risk (leverage)
 - Places loans in risk buckets and assesses default risk based on the performance of the 2007 vintage loans with similar characteristics
- Advantages of the NMRI
 - Near-complete census of gov't-guaranteed loans,
 - Accurate, timely, and in-depth coverage of purchase mortgage trends
 - NMRI provides significant signals of market trends without the noise of other indices
- What does an increasing or decreasing NMRI mean?
 - Increasing NMRI = increasing leverage = looser lending
 - Decreasing NMRI = decreasing leverage = tighter lending

Stressed Default Rates, Home Purchase Loans

Risk Bucket	Credit Score	CLTV	Total DTI	Default Rate
Very Low	≥ 770	61-70%	≤ 33%	0.8%
Low	720-769	76-80%	34-38%	4.2%
Medium	690-719	81-85%	39-43%	9.3%
High	660-689	91-95%	44-50%	22.7%
Very High	620-639	> 95%	> 50%	45.8%

Note: Default rates represent cumulative defaults through year-end 2012 for Freddie Mac's 2007 vintage of acquired loans. The loans included in the calculation are all primary owner-occupied, 30-year fixed-rate, fully amortizing, fully documented, home purchase loans.

- Takeaway: Huge spread of default rates across risk buckets
- All 320 risk buckets for home purchase loans are shown at [Periodic Table – Purchase](#)
- Analogous tables for cash-out and no-cash-out refi loans are at [Periodic Tables – Refinance](#)
- Additional loan risk factors are applied to VA loans and to ARMs, investor loans, second homes, 15 year terms, and 20 year terms

Price Tier Methodology

- Goal: create leverage-based price tiers.
- Rationale: segmenting the market by price tier is important because housing policies, new construction activity, and access to leverage vary by these price tier. Thus, these factors can create very different home price appreciation trends depending on the price tier.
- 4 Price Tiers:
 - Low: all sales below the 40th percentile of FHA sales prices
 - Low-medium: all sales at or below the 80th percentile of FHA sales prices
 - Medium-high: all sales at or below 125% of the GSE loan limit
 - High: all other sales
- Data Inputs:
 - Public Records (near-real time with latency and coverage problems).
 - FHA Snapshot (monthly dataset of all FHA endorsements; released around mid-month with a one month lag).
 - FHFA loan limits at the county level.
- Assumptions and Construction:
 - On average, the difference between loan origination and endorsement is one month (we have confirmed this on aggregate by comparing monthly FHA Snapshot to NMRI counts).
 - Price Tiers are set quarterly at the metro level. When there are fewer than 50 FHA loans in a quarter, we pool all FHA loans at the non-metro state level.
 - For the demarcation between medium-high and high tier, we multiply a perspective's county loan limit by 1.25 to account for an 80% LTV, which is the median LTV of loans taken out at the loan limit.
- Result:

2018	Price Tier				Overall
	Low	Low-Med	Med-High	High	
Mortgage Risk Index	16.0%	14.6%	8.8%	3.2%	11.2%
Market Share*	26%	28%	38%	7%	100%

*For institutionally financed sales. May not add to 100% due to rounding.

House Price Appreciation (HPA) Index: A Quick Primer

- Overall goal:
 - Monitor market stability through accurate, real-time tracking of house prices.
- Basics of index construction
 - Most widely known HPA Indices are repeat sales (i.e. Case Shiller or FHFA) or hedonic (Zillow).
 - AEI's HPA is a "quasi" repeat sales index.
 - Index measures HPA by constructing an artificial sales pair consisting of one actual sale and one "artificial" sale as measured by the property's Automated Valuation Model (AVM).
 - The AVM approximates a property's sale price at a given point in time. The AVM used has been evaluated by us and has been found to be, on average unbiased and accurate (meaning that it has a normal error distribution).
- Advantages of AEI's HPA Index
 - Combines the best of repeat and hedonic models.
 - Unlike a repeat sales index, which is limited to repeat sales and may therefore be biased, AEI's index includes the entire universe of sales.
 - Unlike a hedonic index, which incorporates every property (even unsold ones), it reduces the amount of errors since at least one sale of the transaction pair actually occurred.
 - Allows for an index construction by price tier and fine geographic levels (down to census tract).
- Data for the HPA index
 - National Public Records data and AVM for Dec-2018 come from First American via DataTree.com.
 - Uses virtually all institutionally financed sales back to January 2012.
 - Data are weighted at the county level to make them representative.
 - HPAs for the medium-high and high price tiers are spliced around the time of loan limit changes.
- AEI House Price Appreciation Indexes are published nationally and by price tier
 - The four tiers are set at the metro level and adjusted quarterly (see: Price Tier Methodology slide).
 - HPAs are smoothed around the times of FHFA loan limit changes.

Home Sales Methodology

- Data Inputs
 - Public Records (near-real time with latency and coverage problems).
 - HMDA (annual dataset of institutionally financed sales (IFS); covers around 99% of loans; released with lag).
 - FHA Snapshot (monthly dataset of all FHA endorsements; released around mid-month with a one month lag).
 - National Mortgage Risk Index (NMRI) (covers 99% of Agency loans; two months lag).
- Assumptions
 - Recorder offices process transactions in random order; latency in reporting applies equally across all sales types.
 - FHA loans are properly recorded (stamp on mortgage document).
 - On average, the difference between loan origination and endorsement is one month (we have confirmed this on aggregate by comparing monthly FHA Snapshot to NMRI counts).
 - Conventional loans have same seasonal pattern as GSE loans.
- Construction
 - Aggregation from the county level up.
 - Use FHA Snapshot for all FHA sales.
 - When HMDA is available: Use HMDA for remaining IFS when available:
 - Impute cash and other financed sales as a percentage of IFS (assume state average for counties with latency problems);
 - Impute seasonal pattern from either public records or NMRI.
 - When HMDA is not yet available: Use Public records with adjustments:
 - Limited to ~ 700 counties that account for ~80% of sales (remove counties with insufficient FHA counts or breaks in series);
 - Gross up all sales in that county by the ratio of FHA Public Records loans to FHA Snapshot loans;
 - Assume same rate of change for ~2400 counties with ~20% of sales -> *still working on improving this assumption*.
 - As a robustness check of this, we compare state VA and RHS totals to the NMRI and adjust totals.

New Construction Identification (NC) Methodology (still refining)

- Data Inputs
 - Public Records (Deed & Assessor files)
 - Zillow API and/or Listings data
- Identification of NC
 - Year Built in Assessor data
 - If Year Built is missing:
 - Seller name (we have assembled a list of over 400 builders with their subsidiaries and key words to identify smaller builders.) If a seller is a builder and the Year Built is missing, then it is most likely a new construction that has not yet been assessed.
 - Ping Zillow API for Year Built and Use Code. Data not perfect, along with other data helps determine status.
 - Sellers with multiple sales that are not individuals/gov't/lender/other corporation are most likely builders (relatively small number).
 - Count only first sale of home as a new construction.
- Verification – Quality Control, Quality Control, Quality Control
 - Random sampling and checking of new constructions and existing homes using Zillow data, Google street view/satellite images.
 - Find 2% false positives and 1% false negatives.
 - Builder example: AEI NC found 93% of DR Horton sales (unweighted) and 105% (weighted)
- Final dataset allows us to:
 - Monitor new constructions at the property level,
 - Accurately estimate new home sales at fine geographic levels when combined with Home Sales #s,
 - Estimate additions to the existing housing stock when combined with Assessor data,
 - Estimate sales by builder and track builder, and
 - Combine new construction numbers with Months' Supply and house price appreciation.
- Other considerations
 - Lag in data; originally estimated at ~4 quarters; with more data processed, looks like 1-2 months.
 - Hard to identify owner-built homes without a long lag.

AEI-adjusted Land Prices and Land Shares Methodology

Methodology

- AEI-adjusted land price and land share indicators are based on data for 2012 from “[The Price of Residential Land for Counties, ZIP Codes, and Census Tracts in the United States](#)” by Davis (Rutgers), Larson (FHFA), Oliner (AEI), and Shui (FHFA). However, due to potential biases (anchored to tax assessments and a limitation to GSE appraisals), the Davis et al. data likely understate the amount of home price appreciation and, by extension, the amount of increase in land prices. Therefore, we enhance the Davis et al. data using AEI’s constant-quality [home price appreciation index](#).

How exactly is the AEI adjustment done?

- The AEI-adjusted data use the 2012 land prices and shares from the Davis et al. paper as a stake in the ground. These values are then rolled forward in time using various AEI metrics and assumptions.

Data:

- AEI constant-quality HPA series: This is an annual series for each zip code indexed to 0 in 2012.
- AEI’s public records dataset: We use the 2012 average sale price for each ZIP code.

Assumptions:

- The structure value in 2012 is approximated using the 2012 land share from the Davis et al. dataset and AEI’s average sale price.
- The structure value is assumed to increase at a rate of 2% per year. (This assumption will be refined once more granular construction cost indexes become available.)
- The average sale price is rolled forward using its 2012 value and the constant-quality HPA series.
- The land share for any year is calculated as the difference between 100% and the ratio of that year’s adjusted structure value and adjusted average sale price. Once a year’s land share for a ZIP code is known, we adjust the 2012 land prices according to the changes in the land share over time.
- Detailed methodology can be found here: <https://www.aei.org/wp-content/uploads/2020/03/Land-Price-Interactive-QA-FINAL.pdf>

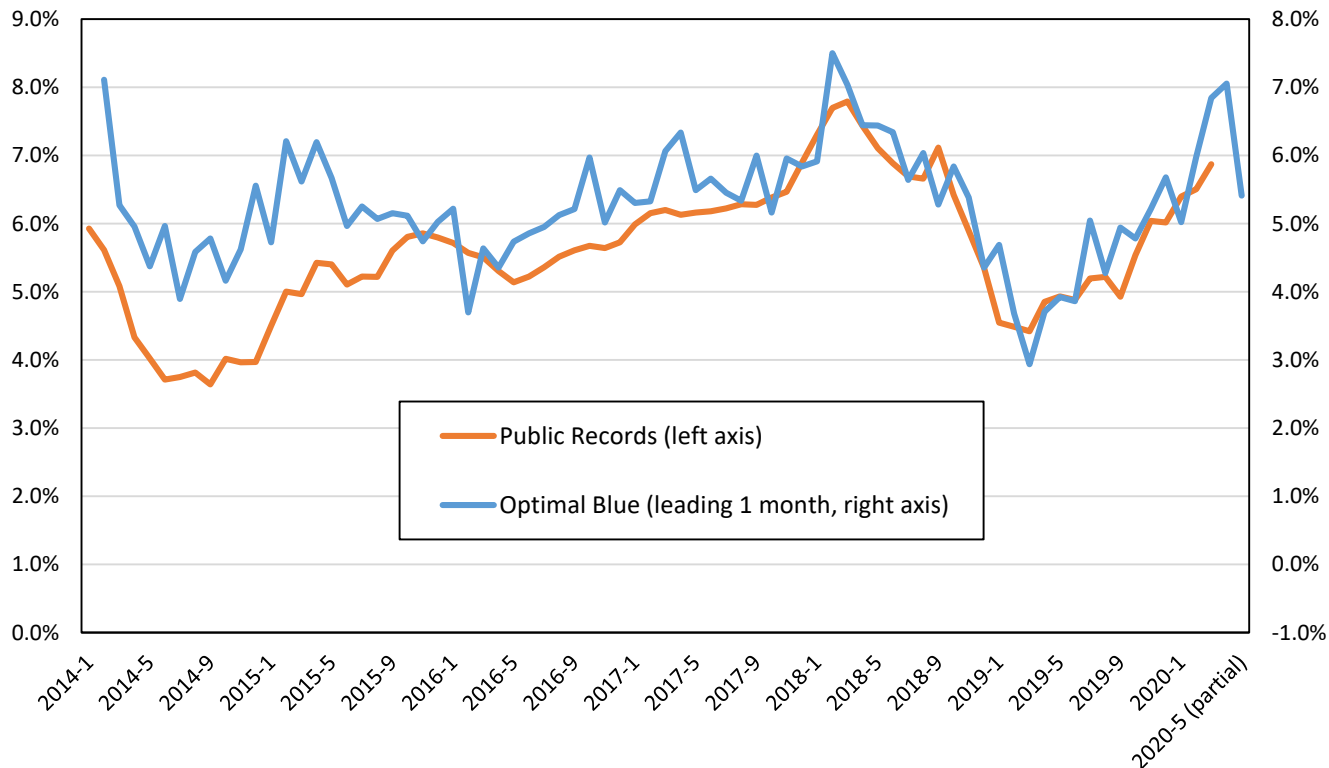
AEI Flash Housing Market Indicators using Optimal Blue Data

- The AEI Housing Center is providing near-real time Flash Housing Market Indicators (HMI) during the coronavirus (COVID-19) era. Released each Monday, the Flash HMIs will provide weekly insights on:
 - house prices,
 - credit underwriting standards,
 - purchase and refinance origination trends
 - cash out amounts, and
 - much more.
- What is the significance
 - The Flash Housing Market Indicators reports are possible thanks to newly acquired data from [Optimal Blue](#), a rate lock software provider with roughly a third market coverage.
 - After extensive historical analysis of Optimal Blue data going back 7 years, we have concluded that these rate lock data track closely those reported in our National Mortgage Risk Index (NMRI), which cover 99% of the agency market.[1] As a result, today's Flash HMI will provide an advance look trends which will not be reported in our NMRI until late-June, a pick-up of 3 months. In terms of home price appreciation trends, the weekly data we are beginning to report on today, also would not be available until late-June or even late-July and would be reported on a monthly basis.
- Released each Monday, the Flash HMIs will provide much-needed and timely insights on the single-family residential housing market convulsing from the effects of the coronavirus pandemic.
- The Flash HMI Reports are available on our website [here](#).

[1] While not all rate locks will be originated or the Optimal Blue data cover the entire market, our analysis of the data has found them to be instructive as the changes over short time periods provide a useful signpost for what's to come. While Optimal Blue data is used, Edward Pinto and Tobias Peter are solely responsible for the analysis.

House Price Appreciation (HPA) Trend Comparison

A simplified HPA regression using Optimal Blue data seems to fairly accurately predict HPA trends, while also providing a window in the future. There is a small level difference between both series.



Note: Based on purchase price estimates from rate lock data and their geographic location, we construct a weekly home price appreciation index. The index estimates an average weekly sale price controlling for location at the ZIP code level. The data are weighted by county, loan type, and year using HMDA data to account for differences in coverage of the Optimal Blue data. For the years for which HMDA data are not yet available, we assume the same weight as for 2018. This index largely replicates the findings of our constant-quality quasi repeat sales home price appreciation index available [here](#). Optimal Blue's data coverage has improved over the years, which is reflected in the closer alignment in levels over time.

Source: AEI Housing Center, www.AEI.org/housing and Optimal Blue.

List of Abbreviations

Term	Description
MRI	The Mortgage Risk Index (MRI) measures how the loans originated in a given month would perform if subjected to the same stress as loans originated in 2007, which experienced the highest default rates as a result of the Great Recession.
NMRI	The National Mortgage Risk Index (NMRI) currently covers home purchase and refinance loans (except for VA refinances) that have been (1) acquired and securitized by Fannie Mae or Freddie Mac or (2) insured or guaranteed by the Federal Housing Administration (FHA), the Department of Veterans Affairs (VA), or the Rural Housing Service (RHS).
SMRI	The State-level Mortgage Risk Index (SMRI) measures mortgage risk on a state level. It employs exactly the same stress-test methodology as the national index.
FBMSI	The First-time Buyer Mortgage Share Index (FBMSI) equals the number of loans made to first-time buyers divided by the number of all home purchase loans excluding those made to investors and second home buyers for any given month (see first-time buyer (FTB) definition below). The agency FBMSI covers government-guaranteed loans, while the combined FBMSI covers both government-guaranteed and private-sector loans. The agency loans are from the same database used for the NMRI, while the private-sector component of the combined FBMSI come from AEI's National Housing Market Index (NHMI) and assumptions believed to be reasonable.
FBMRI	The First-time Buyer Mortgage Risk Index (FBMRI) is calculated using the same methodology as for the NMRI. The only difference is that the set of included loans is restricted to first-time buyers.
FTB	AEI uses the federal government's definition of a first-time homebuyer (FTB). A FTB is an individual borrower who (1) is purchasing the mortgaged property, (2) will reside in the mortgaged property as a primary residence, and (3) had no ownership interest (sole or joint) in a residential property during the three-year period preceding the date of the purchase of the mortgaged property. Investment properties, second homes, and refinance transactions are not eligible to be considered first-time homebuyer transactions. Other organizations such as the National Association of Realtors (NAR) use a different definition of FTB based on self-identification.
RB	Repeat Buyers (RB) are all home buyers that are not first-time buyers.

List of Abbreviations (cont'd)

Term	Description
GSE	A Government-Sponsored Enterprise (GSE) is an entity created by Congress that operates under a government-defined mission and charter. There are two housing-related GSEs: Freddie Mac and Fannie Mae. They purchase mortgages on the secondary market and subsequently pool them into mortgage-backed securities (MBS), which are purchased by government and private investors.
Fannie Mae	The Federal National Mortgage Association (FNMA), known as Fannie Mae, was founded in 1938 as part of the New Deal legislation.
Freddie Mac	The Federal Home Loan Mortgage Corporation (FHLMC), known as Freddie Mac, was created in 1970 to complement Fannie Mae.
Ginnie Mae	The Government National Mortgage Association (Ginnie Mae) is a federal government corporation that aims to promote homeownership for low- and moderate-income families. It ensures the timely payment of principal and interest on mortgage-backed securities formed from mortgages that are guaranteed or insured by FHA, VA, RHS, or smaller programs for Native Americans. Ginnie Mae was created in 1968. Prior to 1968 its role was performed by Fannie Mae.
FHA	The Federal Housing Administration (FHA), founded in 1934, is a federal agency that today provides mortgage insurance for residential loans made to high-risk borrowers. The borrower pays an upfront mortgage insurance premium as well as monthly insurance premiums for the service. In return, FHA covers 100% of the lender's loss in case of the borrower's default.
RHS	The Rural Housing Service (RHS) is a program within the U.S. Department of Agriculture that guarantees mortgages in rural areas. The borrower pays an upfront annual fee for the service. In return, RHS covers 100% of lender's loss in case of the borrower's default.
VA	The Department of Veterans Affairs (VA) guarantees mortgages to eligible veterans and generally pays 25% of lender's loss in case of the borrower's default. The borrower pays an upfront annual fee for the service.
HUD	FHA has been overseen by the Department of Housing and Urban Development (HUD) since its creation in 1965.

List of Abbreviations (cont'd)

Term	Description
FICO®	The FICO Credit Score is a statistical credit evaluation score developed by Fair, Isaac and Co. The FICO score attempts to measure a borrower's risk of default through his or her personal financial history. FICO scores range from a high default-risk score of 300 to a low default-risk score of 850. The term "credit score" is used to connote a generic score.
LTV / CLTV	The Loan-to-Value Ratio (LTV) is the ratio of the 1 st lien loan amount to the property's value. Since the down payment on a purchase transaction is the property's value minus the loan amount, the LTV is inversely related to the down payment. The Combined Loan-to-Value (CLTV) is the ratio of all loan amounts at 1 st lien origination to the property's value. Both ratios are a measure of a borrower's skin in the game.
DTI	The total Debt-to-Income Ratio (DTI) gauges the ability of a borrower to repay a mortgage by measuring the amount of income consumed for repayment of all outstanding debts of the borrower.
ARM	An Adjustable-Rate Mortgage (ARM) is a mortgage whose interest rate varies over the lifetime of the loan based on market conditions. ARMs have on average a higher default risk than FRMs.
FRM	A Fixed Rate Mortgage (FRM) maintains the interest rate at origination throughout the lifetime of the loan.
MSA	A Metropolitan Statistical Area (MSA) is a geographical region with a population of at least 50,000 inhabitants at its core and close economic ties throughout the region.
PCE price index	The Personal Consumption Expenditure (PCE) price index measures the prices of goods and services purchased by consumers in the U.S. economy. It is published monthly by the Bureau of Economic Analysis in the Department of Commerce. The PCE price index is the measure of inflation targeted by the Federal Reserve.
SLOOS	The Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS) is a survey of lending conditions conducted quarterly by the Federal Reserve among roughly eighty large domestic banks and twenty-five U.S. branches and agencies of foreign banks.

List of Abbreviations (cont'd)

Term	Description
QM/QRM	The Qualified Mortgage (QM) and the Qualified Residential Mortgage (QRM) are mortgage terms created under the Dodd-Frank Act. A mortgage that meets the QM requirements provides legal protection for lenders against a claim that the loan was made without due consideration of the borrower's ability to repay. The QRM designation relates to the securitization of mortgages. If the loans in a mortgage-backed security are QRMs, the securitizing agent is not required to retain any risk position in the security. Although the initial proposed QRM definition was relatively strict, the final definition was watered down to be equivalent to the looser QM definition. The five guarantee agencies (Fannie Mae, Freddie Mac, FHA, VA, and RHS) are exempt from substantial portions of the QM rules and entirely from the QRM rules. (For Fannie and Freddie, this exemption applies only while they are in conservatorship).
MIP	The Mortgage Insurance Premium (MIP) is a payment to compensate for the risk of default on the mortgage. As noted above, FHA mortgages carry both upfront and monthly MIP payments. Fannie Mae and Freddie Mac generally require mortgage insurance for loans they guarantee with LTVs above 80%; borrowers with these GSE-guaranteed loans may make monthly MIP payments depending on the premium plan.
TRID	The TILA-RESPA Integrated Disclosure (TRID) rule – commonly also known as Know Before You Owe – requires lenders to summarize and more prominently display the loan terms on the mortgage form. It also institutes a three-day waiting period before closing to allow borrowers time to review the contract. The form change is currently suppressing sales volume as it is delaying loan closings by creating additional burdens on lenders. TRID was mandated by the Consumer Financial Protection Bureau (CFPB) and applies to mortgage applications filed on or after October 3, 2015.
APOR	The average prime offer rate (APOR) is a weekly survey-based estimate of the Annual Percentage Rates (APRs) of “best quality,” 80% LTV, first-lien loans. The APOR is available for (1) 30-year fixed-rate; (2) 15-year fixed-rate; (3) five-year variable-rate; and (4) one-year variable-rate loan products.
Rate Lock	A rate lock is an agreement between a borrower and a lender which guarantees that the mortgage will be available to the borrower at a specific interest rate for a certain amount of time. All rate locks reported on in this briefing are made using Optimal Blue, a rate lock software provider covering roughly a third of the market.