

# Global Markets Analysis Report

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PREPARED FOR GINNIE MAE



# Global Markets Analysis Report

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## Highlights

Starting in December of 2020, comments from Fed officials indicated that the Federal Open Market Committee (FOMC) would begin to discuss tapering of Fed purchases of Treasury Securities and Agency MBS as the economy made progress towards two goals; maximum employment, and inflation at the rate of 2 percent over the longer run.

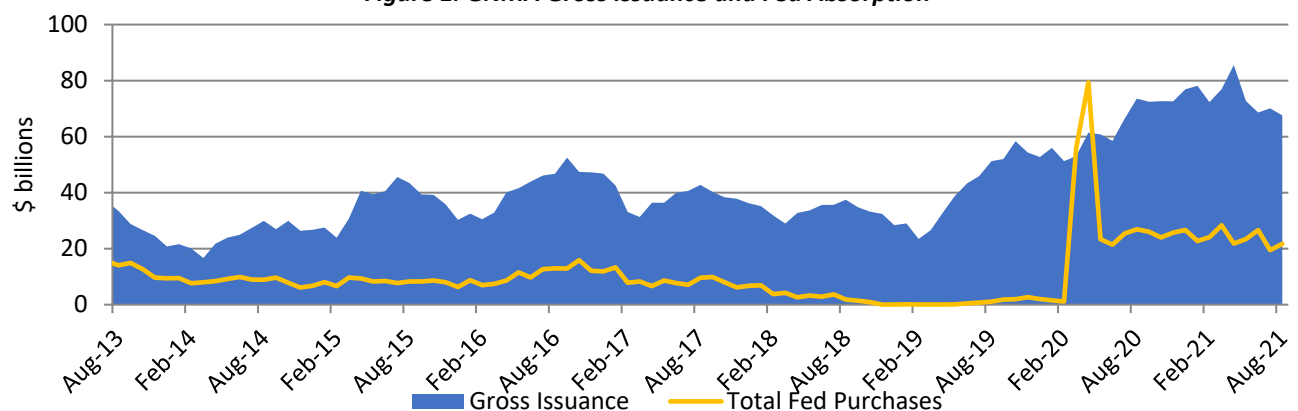
In their most recent press release on September 22, 2021, the FOMC indicated that “the economy has made progress toward these goals. If progress continues broadly as expected, the Committee judges that a moderation in the pace of asset purchases may soon be warranted.”<sup>1</sup>

In a press conference following the press release, the chair of the FOMC, Jerome Powell, indicated that “many on the Committee feel that the test [for beginning our taper] is already met” and that “in [Chairman Powell’s] thinking the test is all but met.”<sup>2</sup>

During a speech delivered on September 27, 2021 the President and CEO of the Federal Reserve Bank of New York (FRBNY) indicated that “it’s clear that we have made substantial further progress on achieving our inflation goal. There has also been very good progress toward maximum employment. Assuming the economy continues to improve as I anticipate, a moderation in the pace of asset purchases may soon be warranted.”<sup>3</sup>

As discussed by the featured commentators in the September *Global Market Analysis Report Highlights*, several factors may influence the taper, including the magnitude or timing of the taper, attendant changes in MBS spreads, and investor demand for high-quality liquid assets (HQLAs). Monthly purchases of Ginnie Mae MBS by the Fed reached their maximum in April 2020 with \$79 billion of Ginnie Mae MBS purchased (for more information on Fed purchases of MBS see section [9.5 Federal Reserve Absorption of Agency MBS](#)). Over the last three months, Fed monthly purchases of Ginnie Mae MBS were \$19.5 billion in July, \$21.7 billion in August, and \$23.3 billion in September<sup>4</sup>, the lowest total purchase volume in a 3-month period since the first quarter of 2020 (January 2020 through March 2020).

**Figure 1. GNMA Gross Issuance and Fed Absorption**



<sup>1</sup> <https://www.federalreserve.gov/newsevents/pressreleases/monetary20210922a.htm>

<sup>2</sup> <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20210922.pdf>

<sup>3</sup> <https://www.newyorkfed.org/newsevents/speeches/2021/wil210927>

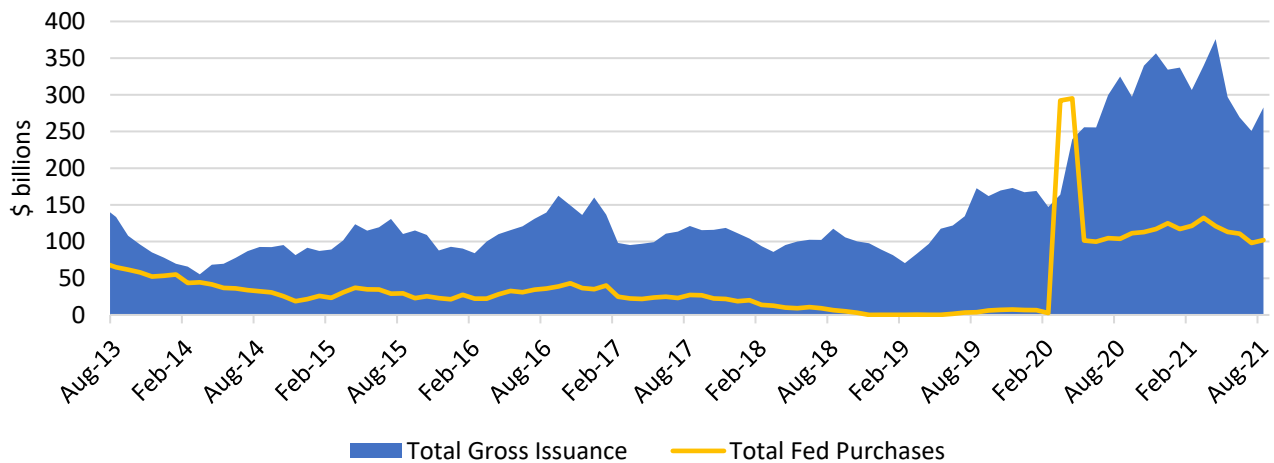
<sup>4</sup> [https://www.newyorkfed.org/markets/ambs/ambs\\_schedule](https://www.newyorkfed.org/markets/ambs/ambs_schedule)

Current Ginnie Mae MBS issuance volumes are at record highs, reaching \$70 billion monthly during the past 14 consecutive months. Over the past four years, average monthly Ginnie Mae MBS issuance volumes have steadily increased from an average of \$34.7 billion per month in 2018, to \$43.7 billion per month in 2019, \$67.7 billion per month in 2020, and, currently, \$78.3 billion per month in 2021.

Gross issuance of Ginnie Mae mortgage-backed securities (MBS) from the start of the pandemic, March 2020, to August 2021 has totaled just over \$1.33 trillion, of which, the Federal Reserve (the Fed) has purchased approximately \$522 billion, representing roughly 39 percent of Ginnie Mae gross MBS issuance during that timeframe.

As of September 2021, the Fed’s Ginnie Mae MBS holdings, as a percent of total assets, was 6.9 percent. The Fed’s Agency MBS holdings, including Ginnie Mae and the GSE’s, as a percent of total assets, was 31.4 percent.

**Figure 2. Agency Gross Issuance and Fed Absorption**



Fed overall purchases of Agency MBS have recently declined to around \$101 billion in July 2021 and \$102 billion in August 2021.

### Current Market Perspectives

With the potential for Fed tapering of Agency MBS purchases, *Global Market Advisory Report* sought perspectives from MBS market participants on the timing and impact of the potential taper on the Ginnie Mae MBS market. Commentators include Christopher Whalen, Chairman of Whalen Global Advisors LLC and Scott Buchta, Senior Managing Director: Head of Fixed Income Strategy at Brean Capital.

*Mr. Whalen:* There is a great deal of speculation as to the impact of an eventual tapering of bond purchases by the FOMC with respect to Treasury collateral and especially MBS. The obvious implication of tapering is that it will result in higher mortgage rates and perhaps also wider spreads as the purchases decline. Certainly the size of the Fed purchases and also the relative indifference of the Fed to prepayments is a significant factor. Against this argument, however, is the continued dearth of risk-free assets globally and overall investor demand for loans and servicing assets. Our view is that a cessation of Fed purchases of GNMA MBS may result in increased volatility in the near term, but any appreciable increase in yields will attract significant interest from domestic and foreign investors, especially if prepayments slow and total returns move back above zero. Medium term, the

fact of continued Fed purchases of longer-dated coupons to maintain the size of the system open market account will effectively keep benchmark yields from rising a lot. Lenders ultimately set mortgage rates, thus I suspect that intense competition for declining volumes will ultimately mute the impact of a change in Fed asset purchase.

*Mr. Buchta:* We expect the Fed to announce the tapering of asset purchases in November, commencing in December. We expect the Fed to reduce purchases by \$5B MBS and \$10B Treasuries per month, and by an additional \$5B and \$10B per month thereafter. The Fed will want to retain a lot of flexibility with regards to the magnitude of the taper each month. Although we expect to see spreads widen modestly when the actual taper begins to take place, the absolute level of widening should be somewhat muted this time around because of the size of their retained MBS portfolio and reinvestment needs. The impact on spreads will be very rate directional. If rates are lower, spreads can move wider than if rates are higher because of the amount of supply hitting the markets in either scenario. Bank demand will also play an important role in determining spreads post-taper, and on this front GNMA securities may have an advantage because of their 0% risk-weighting. Rising rates should also prove to be supportive of GNMA securities as a whole, as their spreads versus similar coupon conventional bonds tend to increase in a rising rate environment (this has already been the case in G2s).

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*The information contained herein is based upon information generally available to the public from sources believed to be reliable as of the specified date. The accuracy of the information contained herein is based on the corresponding accuracy of the issuer data as reported to the Government National Mortgage Association (hereinafter, "Ginnie Mae").*

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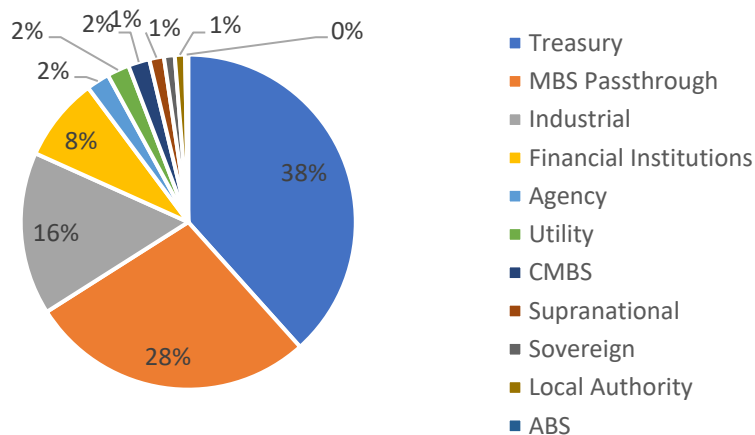
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## 1.0 Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

US MBS (Ginnie Mae, Fannie Mae, and Freddie Mac) contribute approximately 28% of the Barclays US Aggregate Index. US MBS follow only US Treasuries, which contribute approximately 38% of the Barclays US Aggregate Index. For the US Aggregate Index, the month-to-month changes of the index components were no bigger than 1%. In the Barclays Global Aggregate Index by Country, the US share of fixed income still represents the largest share of total outstanding issuance, representing approximately 38% of the total Barclays Global Aggregate Index. This is an increase of 4% from the previous month. The “Other” bucket decreased its share by 8%.

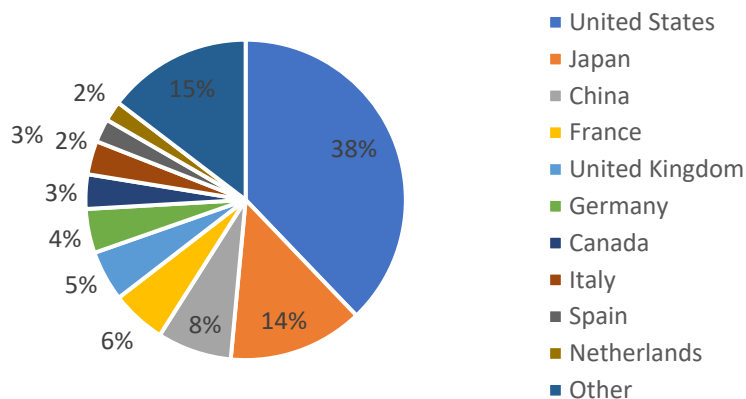
### 1.1 Barclays US Aggregate and Global Indices

**Barclays US Aggregate Index**



Sources: Bloomberg. Note: Data as of September 2021. Numbers in chart may not add to 100 % due to rounding.

**Barclays Global Aggregate Index by Country**



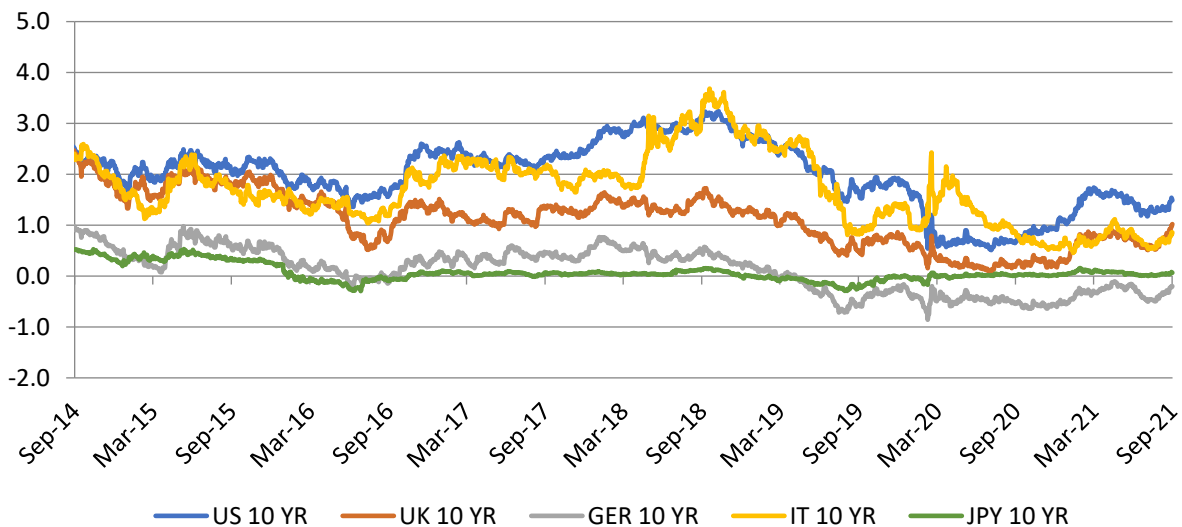
Sources: Bloomberg. Note: Data as of September 2021. Figures in charts may not add to 100 % due to rounding.

# Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

## 1.2 Global 10-Year Treasury Yields

The US 10-year Treasury yield moved to 1.49% in September 2021, an increase month over month of 18 bps. US Treasury yields remain the highest of all the government treasury yields depicted in the figure below. The yield on the Italian 10-year note increased to 0.86% in September, an increase month over month of 15 bps. The yields on the German 10-year and the UK 10-year notes increased by 19 bps to -0.2%, and 31 bps to 1.02%, respectively. The yield on the Japanese 10-year government notes increased to 0.07% in September, a slight increase month over month of 5 bps. At the end of September 2021, the hedged yield for the 10-year Treasury JPY held at 2.61%, a decrease of 4 bps from the previous month. The hedged yield for the 10-year Treasury EUR held at 1.49%, a decrease of 3 bps from the previous month.

**Global 10-Year Treasury Yields**



**7- 10yr Total Return Hedged Index, JPY**



**6 - 10yr Total Return Hedged Index, EUR**



Sources: Bloomberg. Note: Data as of September 2021



# Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

## 1.3 Ginnie Mae Yields– USD

Ginnie Mae MBS yields slightly increased in September 2021. GNMA II yields were at 1.78% and GNMA I yields at 1.99%, up by 9 bps and 10 bps, respectively, from the prior month. At the end of September, Ginnie Mae II SF yields were 30 bps higher than the US 10-year Treasury yield, representing a decrease in spread of 8 bps since last month. The yields on the Ginnie Mae I SF were 50 bps higher than the US 10-year Treasury yield at the end of September, also representing a decrease in spread of 8 bps since last month.

**Ginnie Mae II SF Yield, USD**



**Ginnie Mae I SF Yield, USD**



Sources: Bloomberg. Note: Data as of September 2021

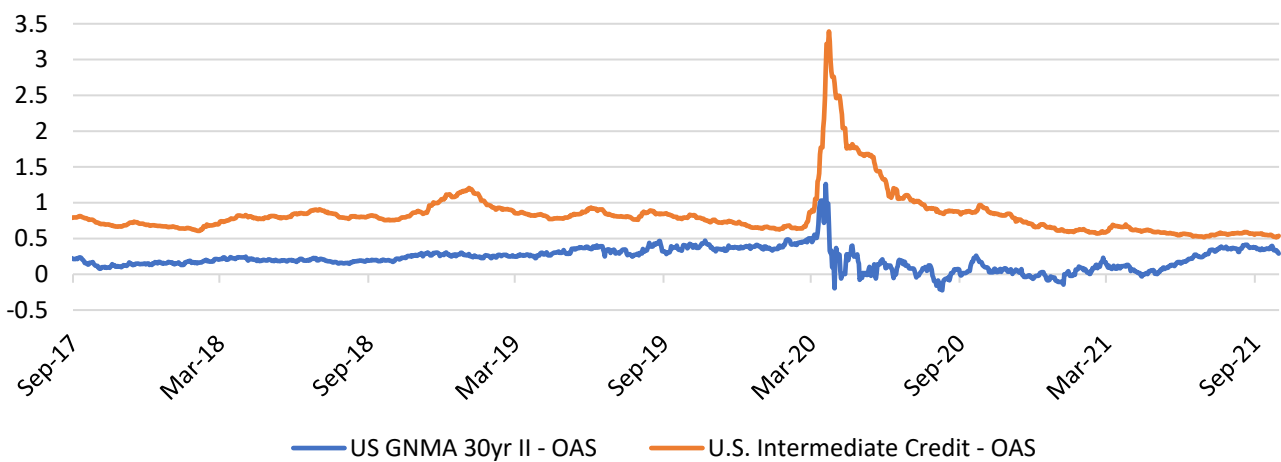


# Relative Attractiveness of US Fixed Income and Ginnie Mae MBS

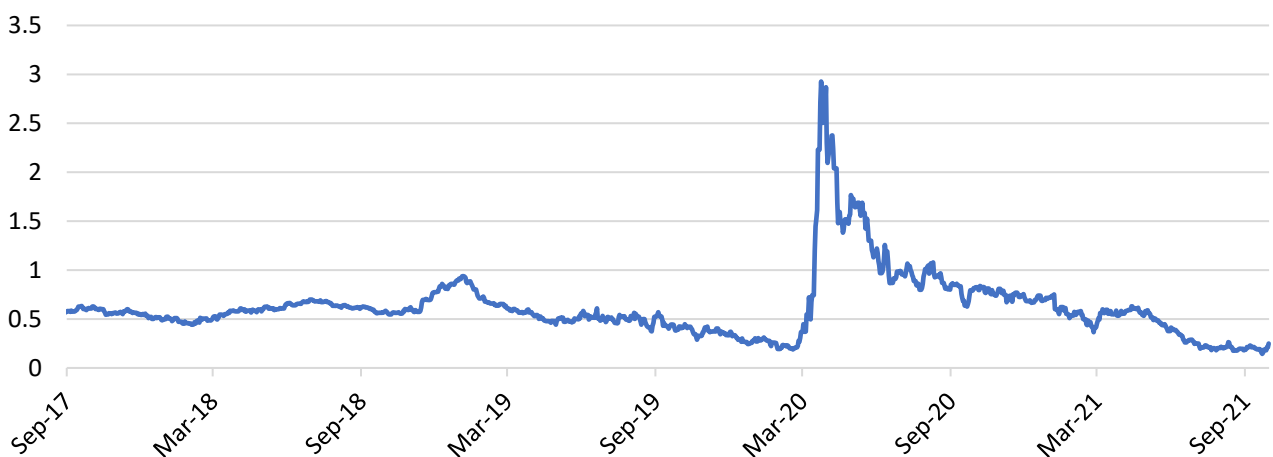
## 1.4 Ginnie Mae Yield Spreads – Intermediate Credit

The yield differential between US Intermediate Credit and GNMA II 30-year OAS increased when compared to the previous month, ending at 0.25%, an increase of 6 bps since the previous month. The Ginnie Mae II 30-year OAS decreased by 8 bps since the previous month. The US Intermediate credit OAS has slightly decreased by 2 bps since last month.

**US GNMA II 30yr MBS OAS versus US Intermediate Credit OAS**



**Spread between US Intermediate Credit and US GNMA II 30yr MBS OAS**

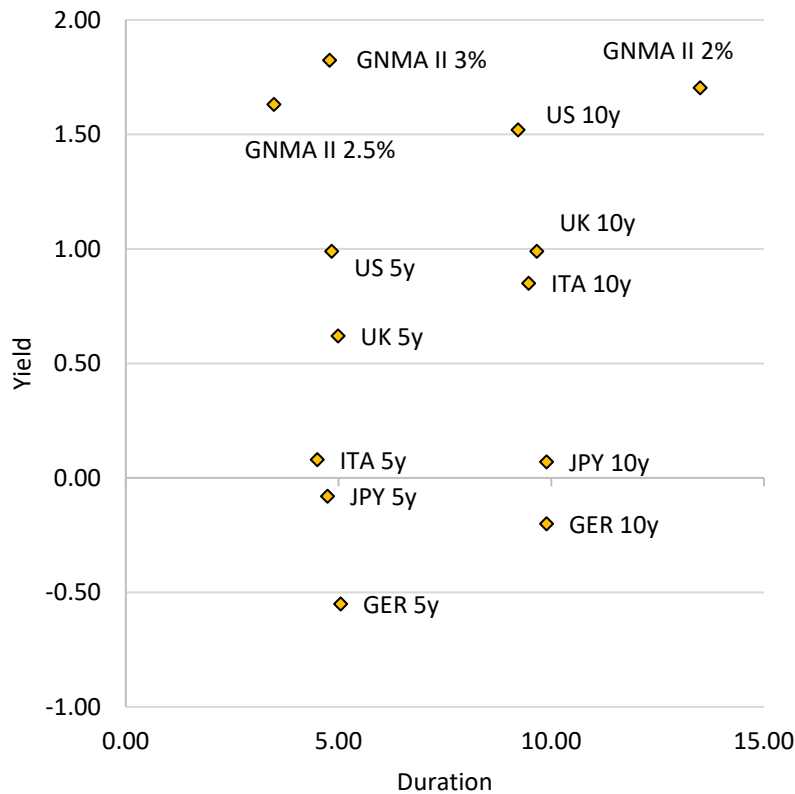


Sources: Bloomberg. Note: Data as of September 2021.

## 1.5 Global Treasury Yield Per Duration

GNMA MBS continue to offer a higher yield in comparison to other government fixed income securities of various tenors with similar or longer duration. Prepayment risk is a feature of MBS. The GNMA MBS 2.5% and 3% products have increased their yield and duration in September. The GNMA II 2.5% securities duration and yield increased by 0.42 units and 18 bps, respectively, when compared to the previous month. Additionally, the GNMA II 3% securities duration and yield increased by 0.25 units and 8 bps when compared to the previous month.

**Yield vs. Duration**



| Security     | Duration | Yield |
|--------------|----------|-------|
| US 5y        | 4.84     | 0.99  |
| US 10y       | 9.22     | 1.49  |
| JPY 5y       | 4.74     | -0.08 |
| JPY 10y      | 9.89     | 0.07  |
| GER 5y       | 5.05     | -0.55 |
| GER 10y      | 9.89     | -0.20 |
| ITA 5y       | 4.50     | 0.08  |
| ITA 10y      | 9.47     | 0.86  |
| UK 5y        | 4.99     | 0.62  |
| UK 10y       | 9.66     | 1.0   |
| GNMA II 2%   | 13.50    | 1.70  |
| GNMA II 2.5% | 4.79     | 1.82  |
| GNMA II 3%   | 3.48     | 1.63  |

Sources: Bloomberg. Note: Yield and modified duration for GNMA II securities is from illustrative TBA using base prepayment assumptions and an assumed settlement of 10/19. All other data is as of September 2021. Yields are in base currency of security and unhedged.

## 2.0 State of the US Housing Market

### 2.1 National HPI

Nationally, home prices exceed their pre-crisis peak on a nominal basis by 45.3% through June 2021. The extent of the HPI rebound since the Global Economic Crisis (GEC) has varied from state to state. There is a positive relationship between the extent of the drop from peak to trough and the scale of the rebound. However, some areas experienced minor declines in home prices but have had significant home price appreciation.

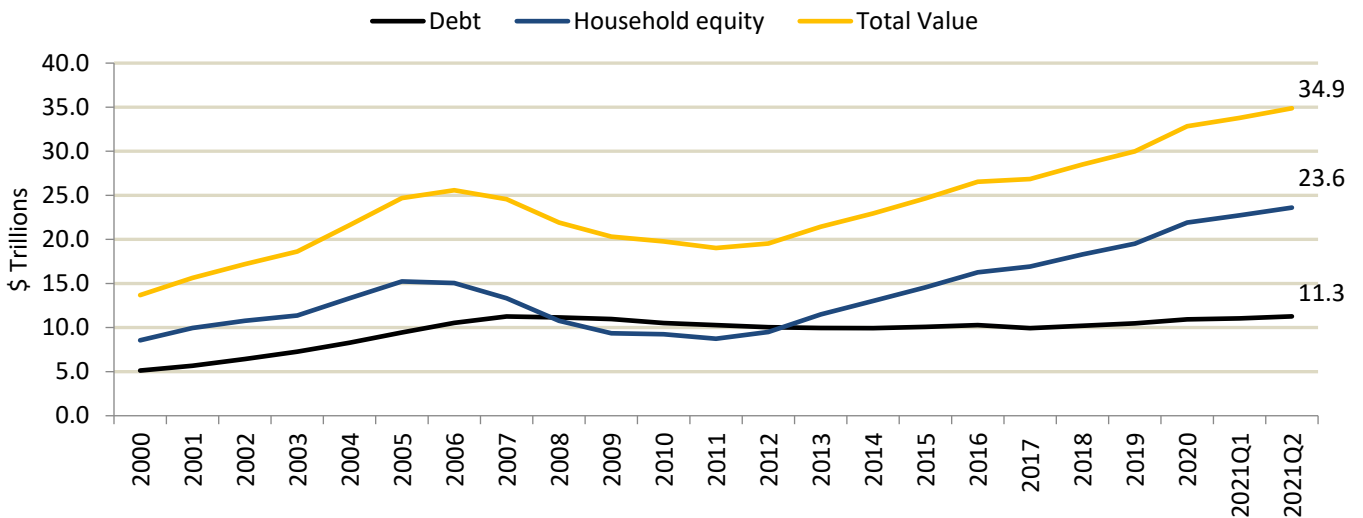
| State           | 2000 to Peak | Peak to Trough | Trough to Current | YOY          | Current HPI % Above Peak |
|-----------------|--------------|----------------|-------------------|--------------|--------------------------|
| <b>National</b> | <b>59.6%</b> | <b>-21.1%</b>  | <b>84.2%</b>      | <b>10.5%</b> | <b>45.3%</b>             |
| AK              | 66.9%        | -5.2%          | 37.4%             | 6.4%         | 30.3%                    |
| AL              | 41.7%        | -15.0%         | 60.6%             | 10.0%        | 36.5%                    |
| AR              | 39.8%        | -11.0%         | 52.7%             | 10.3%        | 35.8%                    |
| AZ              | 110.3%       | -49.5%         | 167.9%            | 16.4%        | 35.3%                    |
| CA              | 144.8%       | -47.0%         | 132.1%            | 13.8%        | 23.0%                    |
| CO              | 32.4%        | -10.2%         | 134.5%            | 13.1%        | 110.6%                   |
| CT              | 72.9%        | -19.6%         | 34.9%             | 13.7%        | 8.4%                     |
| DC              | 162.7%       | -11.8%         | 114.6%            | 10.2%        | 89.3%                    |
| DE              | 88.7%        | -23.5%         | 50.4%             | 12.0%        | 15.1%                    |
| FL              | 130.2%       | -46.5%         | 135.8%            | 12.8%        | 26.0%                    |
| GA              | 35.9%        | -27.1%         | 106.5%            | 11.2%        | 50.6%                    |
| HI              | 138.9%       | -26.9%         | 91.0%             | 8.9%         | 39.6%                    |
| IA              | 27.9%        | -5.4%          | 51.6%             | 8.0%         | 43.4%                    |
| ID              | 73.3%        | -32.3%         | 190.6%            | 23.8%        | 96.6%                    |
| IL              | 49.9%        | -23.8%         | 44.0%             | 8.7%         | 9.7%                     |
| IN              | 19.1%        | -8.6%          | 73.5%             | 11.0%        | 58.5%                    |
| KS              | 31.0%        | -7.7%          | 63.6%             | 10.8%        | 51.1%                    |
| KY              | 28.9%        | -5.5%          | 60.7%             | 9.9%         | 51.9%                    |
| LA              | 51.6%        | -6.6%          | 42.7%             | 6.5%         | 33.3%                    |
| MA              | 69.9%        | -18.1%         | 73.4%             | 12.1%        | 41.9%                    |
| MD              | 126.4%       | -26.4%         | 50.2%             | 10.2%        | 10.5%                    |
| ME              | 72.0%        | -12.4%         | 71.3%             | 14.6%        | 50.1%                    |
| MI              | 18.4%        | -31.5%         | 107.0%            | 11.6%        | 41.8%                    |
| MN              | 52.6%        | -23.0%         | 81.1%             | 10.4%        | 39.5%                    |
| MO              | 39.2%        | -15.0%         | 71.2%             | 11.2%        | 45.5%                    |
| MS              | 38.9%        | -12.9%         | 40.8%             | 7.7%         | 22.7%                    |
| MT              | 79.3%        | -13.8%         | 91.1%             | 14.8%        | 64.8%                    |
| NC              | 39.8%        | -14.1%         | 78.0%             | 12.3%        | 52.9%                    |
| ND              | 51.8%        | -0.8%          | 66.7%             | 5.8%         | 65.3%                    |
| NE              | 24.4%        | -6.0%          | 73.9%             | 10.6%        | 63.5%                    |
| NH              | 72.7%        | -21.9%         | 76.8%             | 14.5%        | 38.0%                    |
| NJ              | 102.2%       | -22.6%         | 48.1%             | 12.8%        | 14.6%                    |
| NM              | 66.7%        | -18.0%         | 52.7%             | 10.5%        | 25.3%                    |
| NV              | 117.4%       | -59.2%         | 192.8%            | 13.0%        | 19.4%                    |
| NY              | 75.8%        | -10.5%         | 53.8%             | 11.4%        | 37.6%                    |
| OH              | 19.6%        | -16.5%         | 74.8%             | 11.3%        | 45.9%                    |
| OK              | 36.9%        | -4.7%          | 56.2%             | 8.8%         | 48.8%                    |
| OR              | 85.7%        | -28.6%         | 124.6%            | 13.6%        | 60.4%                    |
| PA              | 69.0%        | -10.9%         | 54.7%             | 10.7%        | 37.9%                    |
| RI              | 108.2%       | -28.0%         | 75.4%             | 14.4%        | 26.2%                    |
| SC              | 40.6%        | -16.0%         | 79.8%             | 11.0%        | 51.1%                    |
| SD              | 40.1%        | -2.4%          | 68.1%             | 11.7%        | 64.2%                    |
| TN              | 38.5%        | -12.6%         | 93.7%             | 13.4%        | 69.3%                    |
| TX              | 35.8%        | -3.0%          | 92.0%             | 11.4%        | 86.3%                    |
| UT              | 65.2%        | -26.1%         | 144.5%            | 19.1%        | 80.7%                    |
| VA              | 95.2%        | -18.8%         | 57.2%             | 10.6%        | 27.7%                    |
| VT              | 78.2%        | -10.2%         | 51.6%             | 14.0%        | 36.1%                    |
| WA              | 83.5%        | -27.3%         | 139.2%            | 14.8%        | 73.9%                    |
| WI              | 38.6%        | -14.2%         | 66.5%             | 10.4%        | 43.0%                    |
| WV              | 39.2%        | -5.8%          | 37.9%             | 8.9%         | 29.9%                    |
| WY              | 84.7%        | -9.6%          | 50.5%             | 8.9%         | 36.0%                    |

Source: FHFA. Notes: HPI data as of June 2021. Peak refers to the month when HPI reached the highest level for each state/US during the housing boom period, ranging from 2005 to 2008. Trough represents the month when HPI fell to the lowest level for each state/US after the housing bust, ranging from 2009 to 2012. Current period is 6/2021, the latest HPI data period.

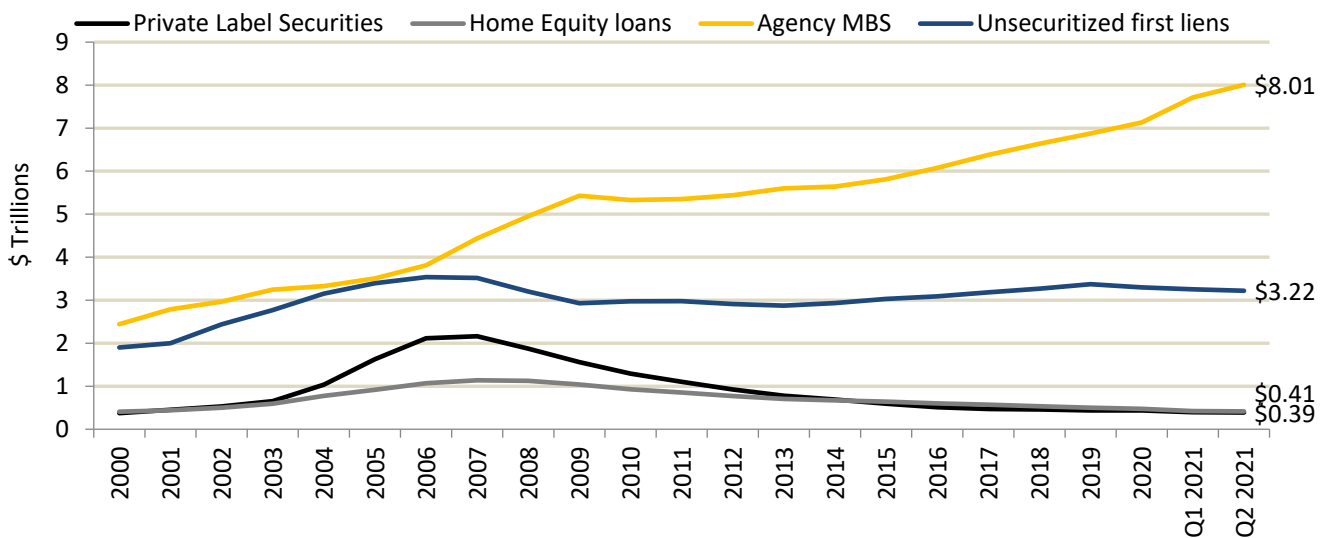
## 2.2 Size and Value of the US Housing Market

The value of household equity has continued to trend upward into Q2 2021, with household equity up approximately 21% from its 2019 average value, and 170% from its trough in 2011. This trend, which began as the economy rebounded from the GEC, has driven the increase in total value of the US housing market, which is up 83% from its trough in 2011. Mortgage debt outstanding has remained relatively flat, increasing from \$11.0 trillion in Q1 2021 to \$11.3 trillion in Q2 2021. The total value of the single-family housing market reached \$34.9 trillion in Q2 2021. Agency MBS account for a growing percentage of the total mortgage debt outstanding, up to 66% of total mortgage debt which represents an increase of almost 2% from the prior quarter.

### Value of the US Housing Market



### Size of the US Residential Mortgage Market

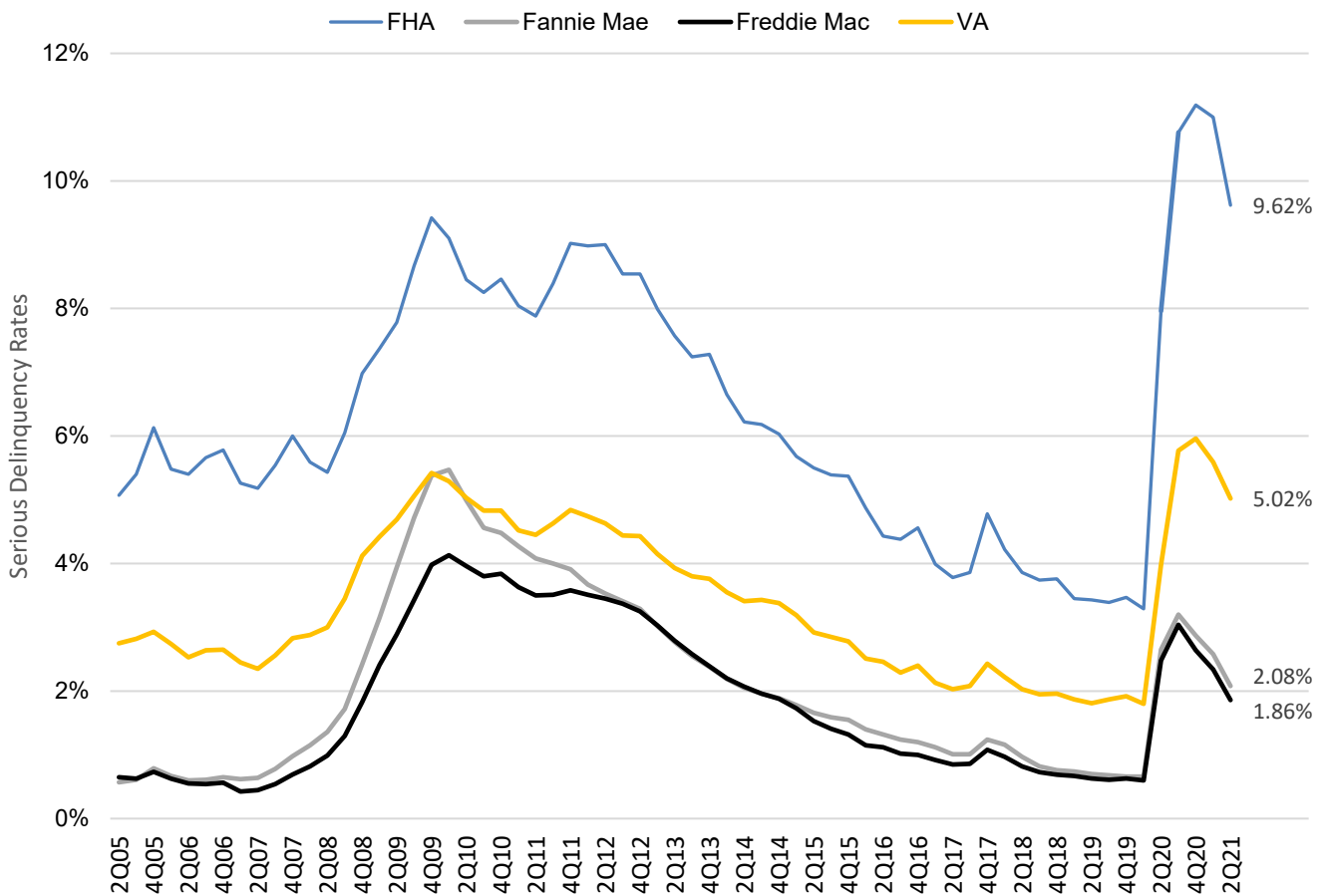


Source: Federal Reserve Flow of Funds Data. Notes: Data as of Q2 2021.

## 2.3 Serious Delinquency Rates

Serious delinquency rates for single family GSE, FHA, and VA loans all fell sharply in Q2 2021. From Q1 to Q2 2021, Fannie and Freddie dropped 50 and 48 bps, respectively, or 19% and 21%, respectively, as a percentage change. Ginnie Mae collateral serious delinquency rates dropped more than the GSE rates in absolute terms, with FHA and VA dropping 138 and 57 bps respectively. This drop in serious delinquency rates is consistent with the decrease in the number of loans in forbearance captured in Section 2.4 below.

### Serious Delinquency Rates: Single Family Loans



Sources: Fannie Mae and Freddie Mac Monthly Summary Reports, and MBA Delinquency Survey.

Note: Serious delinquency is defined as 90 days or more past due or in the foreclosure process. Data as of Q2 2021.

## 2.4 Characteristics of Ginnie Mae Loans in Forbearance

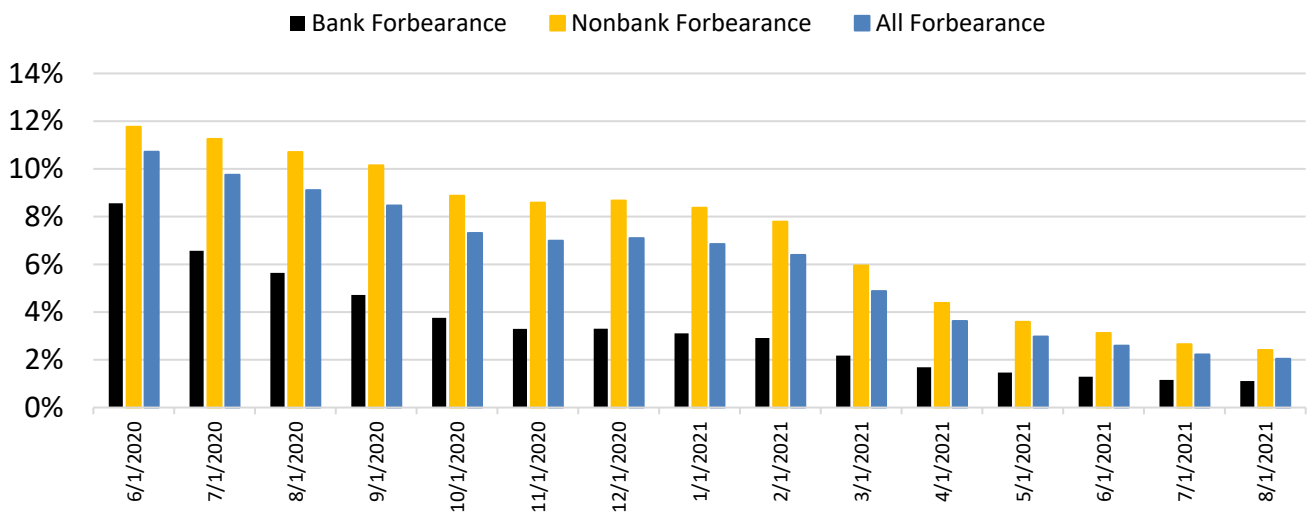
A total of 221,190 Ginnie Mae loans were in forbearance as of the end of August 2021. This represents a 9% decrease MoM, continuing the trend of steep decline in forbearance observed between June and July. 6,426 of loans in forbearance were removed from pools and 214,764 still actively remain in pools. Most liquidated loans (4,809) were FHA and within that subset, 2,088 of those loans were originated by nonbanks. 98% of the loans in forbearance are due to COVID-19 circumstances, up slightly from 97% from the prior month.

| All Loans in Forbearance – August 2021                    |             |            |                                  |                                |                    |            |
|---|-------------|------------|----------------------------------|--------------------------------|--------------------|------------|
|   | FICO Score* | Note Rate* | Current Principal Balance Median | First Time Homebuyer Share (%) | Purchase Share (%) | Loan Count |
| <b>Ginnie</b>   | 659         | 3.7        | \$169,937.15                     | 77.0                           | 67.4               | 221,190    |
| <b>Bank</b>   | 672         | 4.0        | \$125,614.99                     | 74.5                           | 78.0               | 34,240     |
| <b>Nonbank</b>  | 657         | 3.7        | \$178,010.66                     | 77.3                           | 66.3               | 186,950    |
| <b>FHA</b>  | 654         | 3.8        | \$164,197.06                     | 79.4                           | 73.4               | 154,937    |
| <b>Bank</b>   | 665         | 4.1        | \$114,376.34                     | 78.1                           | 82.2               | 25,521     |
| <b>Nonbank</b>  | 653         | 3.8        | \$174,181.65                     | 79.6                           | 72.6               | 129,416    |
| <b>VA</b>   | 669         | 3.4        | \$220,235.91                     | 65.5                           | 47.1               | 47,303     |
| <b>Bank</b>   | 685         | 3.6        | \$187,392.00                     | 65.5                           | 68.5               | 7,027      |
| <b>Nonbank</b>  | 667         | 3.4        | \$225,506.76                     | 65.5                           | 44.1               | 40,276     |
| Loans in Forbearance and Removed from Pools – August 2021 |             |            |                                  |                                |                    |            |
|   | FICO Score* | Note Rate* | Current Principal Balance Median | First Time Homebuyer Share (%) | Purchase Share (%) | Loan Count |
| <b>Ginnie</b>   | 664         | 4.0        | \$147,796.78                     | 74.3                           | 70.5               | 6,426      |
| <b>Bank</b>   | 669         | 4.1        | \$120,315.12                     | 79.2                           | 79.9               | 3,464      |
| <b>Nonbank</b>  | 661         | 3.9        | \$178,975.98                     | 70.5                           | 64.6               | 2,962      |
| <b>FHA</b>  | 658         | 4.1        | \$139,857.51                     | 76.4                           | 77.2               | 4,809      |
| <b>Bank</b>   | 665         | 4.1        | \$113,417.15                     | 81.2                           | 84.3               | 2,721      |
| <b>Nonbank</b>  | 653         | 4.0        | \$170,601.77                     | 72.5                           | 72.3               | 2,088      |
| <b>VA</b>   | 676         | 3.7        | \$195,994.29                     | 65.0                           | 49.1               | 1,245      |
| <b>Bank</b>   | 678         | 3.9        | \$164,439.30                     | 69.1                           | 63.6               | 558        |
| <b>Nonbank</b>  | 675         | 3.6        | \$225,466.17                     | 62.0                           | 41.4               | 687        |
| Loans in Forbearance that Remain in Pools – August 2021   |             |            |                                  |                                |                    |            |
|   | FICO Score* | Note Rate* | Current Principal Balance Median | First Time Homebuyer Share (%) | Purchase Share (%) | Loan Count |
| <b>Ginnie</b>   | 659         | 3.7        | \$170,576.87                     | 77.0                           | 67.3               | 214,764    |
| <b>Bank</b>   | 673         | 4.0        | \$126,181.23                     | 74.0                           | 77.8               | 30,776     |
| <b>Nonbank</b>  | 657         | 3.7        | \$178,000.00                     | 77.4                           | 66.3               | 183,988    |
| <b>FHA</b>  | 654         | 3.8        | \$164,986.33                     | 79.5                           | 73.3               | 150,128    |
| <b>Bank</b>   | 665         | 4.1        | \$114,421.70                     | 77.7                           | 81.9               | 22,800     |
| <b>Nonbank</b>  | 653         | 3.8        | \$174,245.48                     | 79.7                           | 72.6               | 127,328    |
| <b>VA</b>   | 669         | 3.4        | \$220,825.73                     | 65.5                           | 47.1               | 46,058     |
| <b>Bank</b>   | 685         | 3.6        | \$189,374.54                     | 65.2                           | 68.9               | 6,469      |
| <b>Nonbank</b>  | 667         | 3.4        | \$225,506.77                     | 65.5                           | 44.1               | 39,589     |

Sources: Ginnie Mae loan level MBS disclosure and forbearance file and Ginnie Mae Issuer Operational Performance Profile (IOPP) -Peer Group Listings.  
Notes: Data as of August 2021; \*Averages weighted by remaining principal balance of the loans.

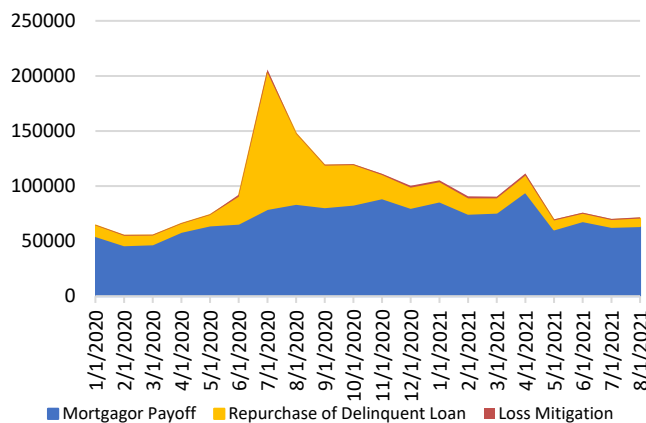
The share of Ginnie Mae loans in forbearance continued to decline to a record low since the pandemic (2.0% in August 2021). In part, due to banks buying out loans in forbearance more aggressively than nonbanks, the forbearance rate for Ginnie Mae MBS issued by nonbanks (2.4%) continues to be higher than that of Ginnie Mae MBS issued by banks (1.1%). The total number of loans liquidated from pools increased slightly in August 2021 from the previous month, but the proportion of loans in forbearance liquidated has decreased sharply, from 5.5% to 2.9%.

## Share of Ginnie Mae Loans in Forbearance

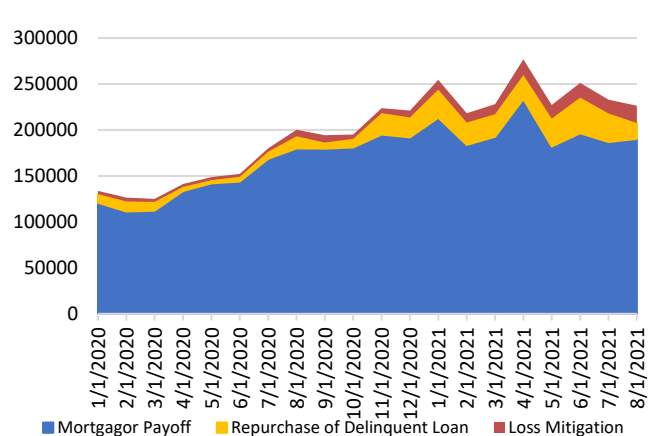


Sources: eMBS and Urban Institute. Data beginning May 2021 sourced from Ginnie Mae forbearance disclosure files and IOPP Peer Group list. Notes: Data as of August 2021.

## Number of Loans Removed from Pools: Bank



## Number of Loans Removed from Pools: Nonbank



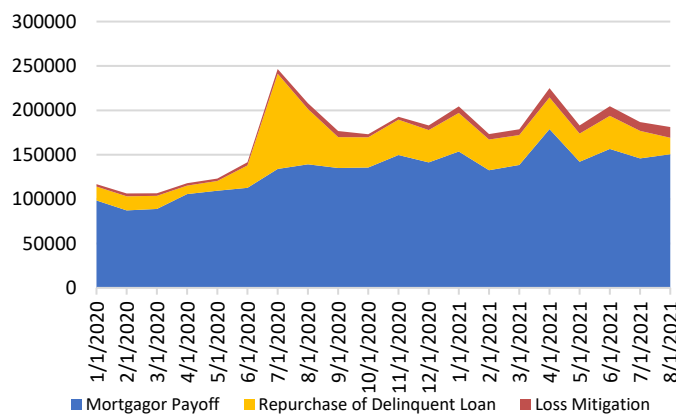
Sources: eMBS and Urban Institute. Data beginning June 2021 sourced from Ginnie Mae Loan Level MBS disclosure files and IOPP Peer Group list. Notes: Data as of August 2021.

Additionally, a small number of loans were removed due to 'Foreclosure with Claim' and 'Other' reasons in August 2021.

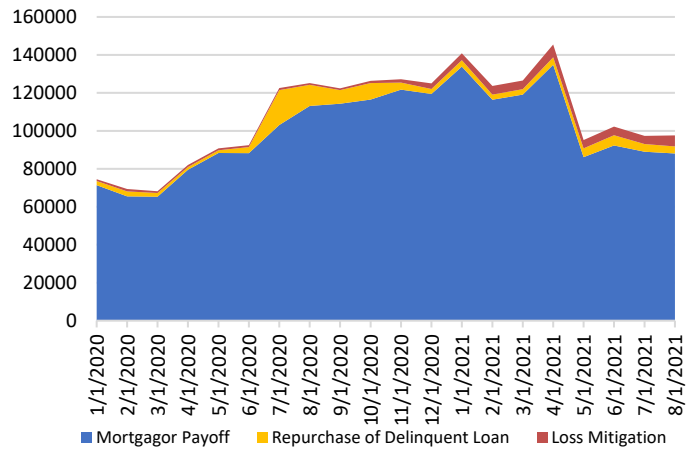


Of the Ginnie Mae loans that were liquidated from pools due to mortgage delinquency, a higher share of the loans were FHA versus VA loans (top charts, yellow areas). Liquidated loans across FHA and VA are also more likely to have coupons greater than or equal to 3.5% (bottom charts). In August 2021, the number of loans repurchased due to delinquency decreased 40% to 18,557 for FHA and 7% to 3,735 for VA loans (these counts include all delinquent buyouts, regardless of forbearance status). The vast majority of loans removed from pools for both FHA and VA continue to be payoffs triggered by the high refinance activity (blue areas).

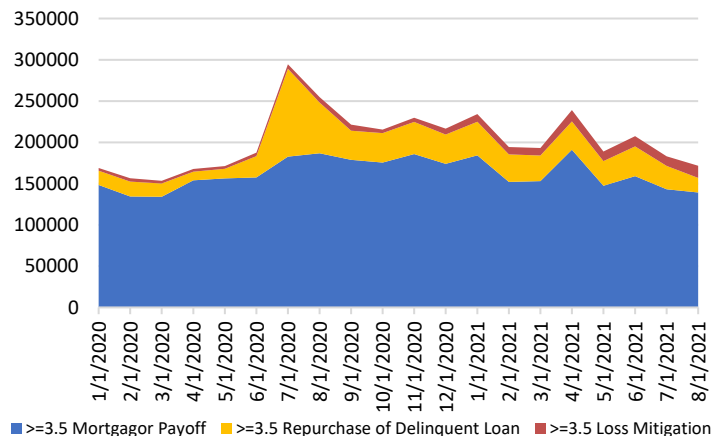
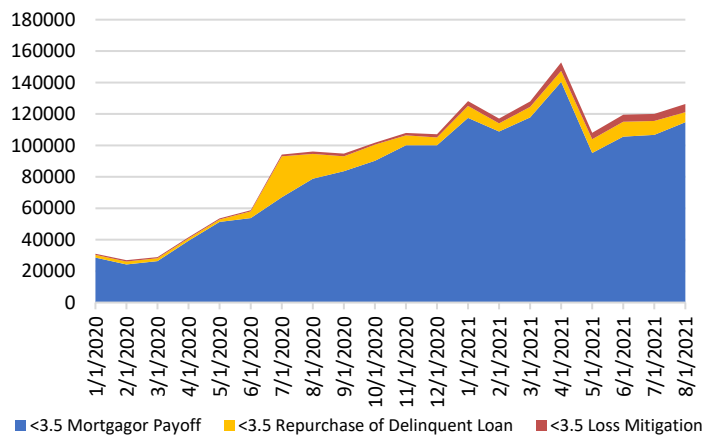
### Number of Loans Removed from Pools: FHA



### Number of Loans Removed from Pools: VA



### Number of Loans Removed from Pools by Coupon



Additionally, a small number of loans were removed due to 'Foreclosure with Claim' and 'Other' reasons in August 2021.

Sources: eMBS and Urban Institute. Data beginning June 2021 sourced from Ginnie Mae Loan Level MBS disclosure files, Ginnie Mae Pool Level MBS disclosure files and IOPP Peer Group list. Notes: Data as of August 2021.

## 2.5 Ginnie Mae Agency Issuance and Agency Outstanding by State

Ginnie Mae MBS represent approximately 23% of new Agency issuance over the past year. The share of Ginnie Mae outstanding varies across states, with the highest Ginnie Mae share in Alaska (50%) and the lowest in the District of Columbia (11%). The difference between recent Ginnie Mae issuance share of Agency Issuance (23%) and overall outstanding Ginnie Mae share (27%) is reflective of ebbs and flows in FHA and VA first lien origination market share, discussed in Section 2.8 below.

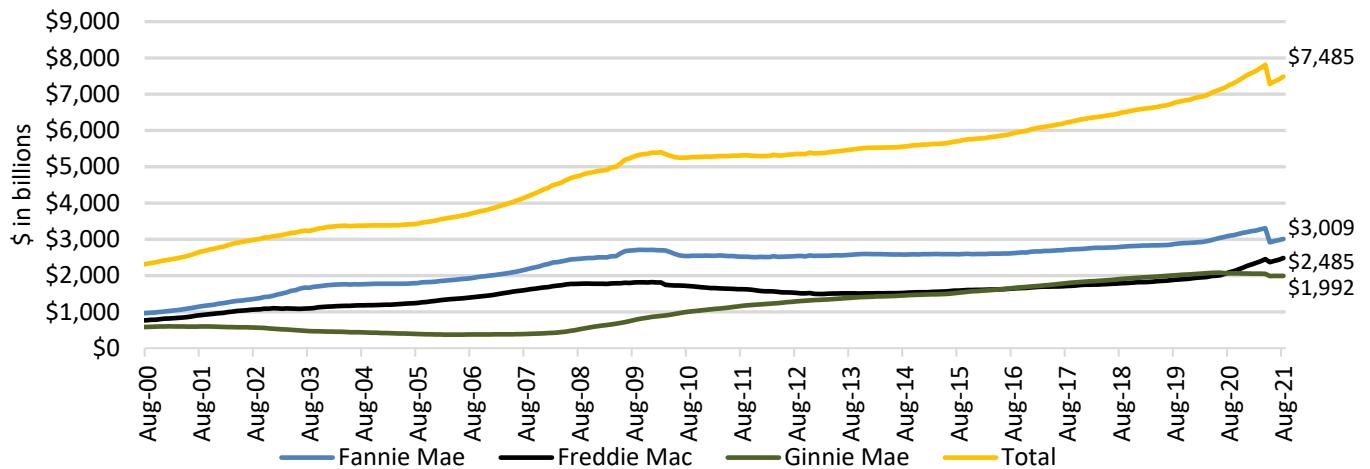
|                 | Agency Issuance (past 1 year) |                  |                           |                          | Agency Outstanding |                   |                           |                          |
|-----------------|-------------------------------|------------------|---------------------------|--------------------------|--------------------|-------------------|---------------------------|--------------------------|
|                 | GNMA Share                    | GNMA Loan Count  | GNMA Avg. Loan Size (000) | GSE Avg. Loan Size (000) | GNMA Share by UPB  | GNMA Loan Count   | GNMA Avg. Loan Size (000) | GSE Avg. Loan Size (000) |
| <b>National</b> | <b>23%</b>                    | <b>3,002,611</b> | <b>276.21</b>             | <b>295.06</b>            | <b>27%</b>         | <b>10,692,753</b> | <b>185.00</b>             | <b>214.69</b>            |
| AK              | 50%                           | 10,827           | 330.78                    | 288.96                   | 41%                | 233,154           | 144.19                    | 169.51                   |
| AL              | 36%                           | 58,945           | 213.04                    | 228.44                   | 48%                | 36,904            | 250.46                    | 215.20                   |
| AR              | 33%                           | 31,091           | 175.06                    | 206.88                   | 26%                | 284,210           | 195.88                    | 208.89                   |
| AZ              | 23%                           | 103,349          | 274.75                    | 273.17                   | 40%                | 136,227           | 122.41                    | 152.85                   |
| CA              | 15%                           | 261,163          | 426.70                    | 414.39                   | 17%                | 691,180           | 305.49                    | 311.88                   |
| CO              | 23%                           | 86,920           | 358.78                    | 338.21                   | 24%                | 218,978           | 265.95                    | 262.94                   |
| CT              | 21%                           | 26,053           | 264.66                    | 281.04                   | 26%                | 103,941           | 192.31                    | 204.38                   |
| DC              | 11%                           | 2,887            | 494.52                    | 465.65                   | 33%                | 50,355            | 193.52                    | 202.20                   |
| DE              | 28%                           | 14,107           | 263.02                    | 268.77                   | 13%                | 8,742             | 356.98                    | 347.62                   |
| FL              | 31%                           | 262,652          | 268.90                    | 262.82                   | 33%                | 836,762           | 193.14                    | 196.08                   |
| GA              | 30%                           | 136,784          | 239.97                    | 263.41                   | 35%                | 495,790           | 163.73                    | 193.41                   |
| HI              | 37%                           | 14,844           | 585.02                    | 459.91                   | 31%                | 32,751            | 443.71                    | 346.94                   |
| IA              | 18%                           | 17,706           | 194.92                    | 198.67                   | 25%                | 67,750            | 190.63                    | 206.05                   |
| ID              | 21%                           | 20,910           | 286.44                    | 273.48                   | 22%                | 350,340           | 151.69                    | 174.64                   |
| IL              | 17%                           | 85,409           | 220.25                    | 242.70                   | 32%                | 281,425           | 123.37                    | 143.29                   |
| IN              | 25%                           | 65,810           | 187.68                    | 197.38                   | 22%                | 82,347            | 125.54                    | 145.80                   |
| KS              | 24%                           | 22,726           | 193.16                    | 219.61                   | 30%                | 97,688            | 131.56                    | 157.55                   |
| KY              | 29%                           | 40,175           | 195.21                    | 204.91                   | 35%                | 162,674           | 133.52                    | 149.11                   |
| LA              | 34%                           | 46,875           | 200.35                    | 233.81                   | 40%                | 190,121           | 149.87                    | 173.24                   |
| MA              | 13%                           | 35,060           | 360.62                    | 356.99                   | 27%                | 38,096            | 165.63                    | 183.30                   |
| MD              | 31%                           | 91,311           | 352.50                    | 326.73                   | 34%                | 284,876           | 253.06                    | 243.34                   |
| ME              | 21%                           | 10,507           | 217.18                    | 248.77                   | 16%                | 112,609           | 265.19                    | 263.41                   |
| MI              | 16%                           | 64,213           | 188.70                    | 209.40                   | 21%                | 278,192           | 124.30                    | 151.08                   |
| MN              | 15%                           | 40,217           | 253.19                    | 255.93                   | 19%                | 163,025           | 171.92                    | 191.75                   |
| MO              | 23%                           | 57,635           | 198.95                    | 212.36                   | 48%                | 117,426           | 133.21                    | 154.98                   |
| MS              | 41%                           | 25,490           | 199.78                    | 211.12                   | 30%                | 247,157           | 132.38                    | 155.86                   |
| MT              | 21%                           | 10,099           | 236.50                    | 274.88                   | 25%                | 33,978            | 192.74                    | 203.41                   |
| NC              | 26%                           | 117,675          | 237.74                    | 259.96                   | 27%                | 66,556            | 137.99                    | 154.91                   |
| ND              | 23%                           | 5,063            | 253.03                    | 238.92                   | 32%                | 132,869           | 227.07                    | 219.30                   |
| NE              | 20%                           | 14,936           | 197.35                    | 208.54                   | 24%                | 39,800            | 212.45                    | 205.42                   |
| NH              | 20%                           | 11,730           | 293.54                    | 277.91                   | 22%                | 227,054           | 225.77                    | 247.85                   |
| NJ              | 17%                           | 62,773           | 315.07                    | 336.28                   | 39%                | 95,057            | 155.48                    | 169.63                   |
| NM              | 34%                           | 23,161           | 231.80                    | 234.43                   | 21%                | 305,632           | 196.05                    | 239.06                   |
| NV              | 30%                           | 49,263           | 307.79                    | 285.19                   | 31%                | 419,332           | 161.17                    | 189.59                   |
| NY              | 16%                           | 53,127           | 314.21                    | 340.50                   | 23%                | 16,420            | 184.42                    | 181.62                   |
| OH              | 23%                           | 90,470           | 184.89                    | 202.58                   | 30%                | 422,621           | 122.05                    | 142.93                   |
| OK              | 37%                           | 40,304           | 200.22                    | 211.27                   | 44%                | 189,359           | 131.56                    | 154.28                   |
| OR              | 19%                           | 39,689           | 322.39                    | 316.74                   | 20%                | 113,955           | 233.99                    | 239.90                   |
| PA              | 20%                           | 83,113           | 212.46                    | 246.18                   | 27%                | 390,246           | 143.12                    | 175.47                   |
| RI              | 24%                           | 10,103           | 270.54                    | 272.06                   | 30%                | 34,796            | 214.54                    | 205.21                   |
| SC              | 32%                           | 69,160           | 237.75                    | 244.73                   | 35%                | 228,686           | 168.23                    | 181.61                   |
| SD              | 25%                           | 8,094            | 229.06                    | 223.30                   | 30%                | 29,455            | 160.54                    | 171.09                   |
| TN              | 28%                           | 73,446           | 241.84                    | 255.59                   | 34%                | 279,335           | 159.55                    | 190.26                   |
| TX              | 29%                           | 279,626          | 252.93                    | 270.66                   | 33%                | 1,066,541         | 167.62                    | 197.63                   |
| UT              | 17%                           | 36,693           | 322.70                    | 310.89                   | 20%                | 102,527           | 231.54                    | 246.21                   |
| VA              | 34%                           | 145,462          | 348.40                    | 332.96                   | 19%                | 12,234            | 173.71                    | 173.26                   |
| VT              | 18%                           | 3,156            | 238.18                    | 248.06                   | 37%                | 436,641           | 243.62                    | 244.92                   |
| WA              | 20%                           | 86,833           | 366.95                    | 367.61                   | 22%                | 240,576           | 261.31                    | 275.72                   |
| WI              | 15%                           | 33,128           | 211.97                    | 217.01                   | 44%                | 56,679            | 136.45                    | 140.04                   |
| WV              | 39%                           | 13,650           | 196.77                    | 197.33                   | 17%                | 124,407           | 147.09                    | 158.40                   |
| WY              | 33%                           | 8,191            | 258.40                    | 252.00                   | 36%                | 25,277            | 195.24                    | 194.66                   |

Sources: eMBS, Ginnie Mae/Freddie Mac/Fannie Mae Loan Level MBS Disclosure Files. Notes: Outstanding balance is based on loan balance as of August 2021. Ginnie Mae issuance is based on the last 12 months, from September 2020 to August 2021.

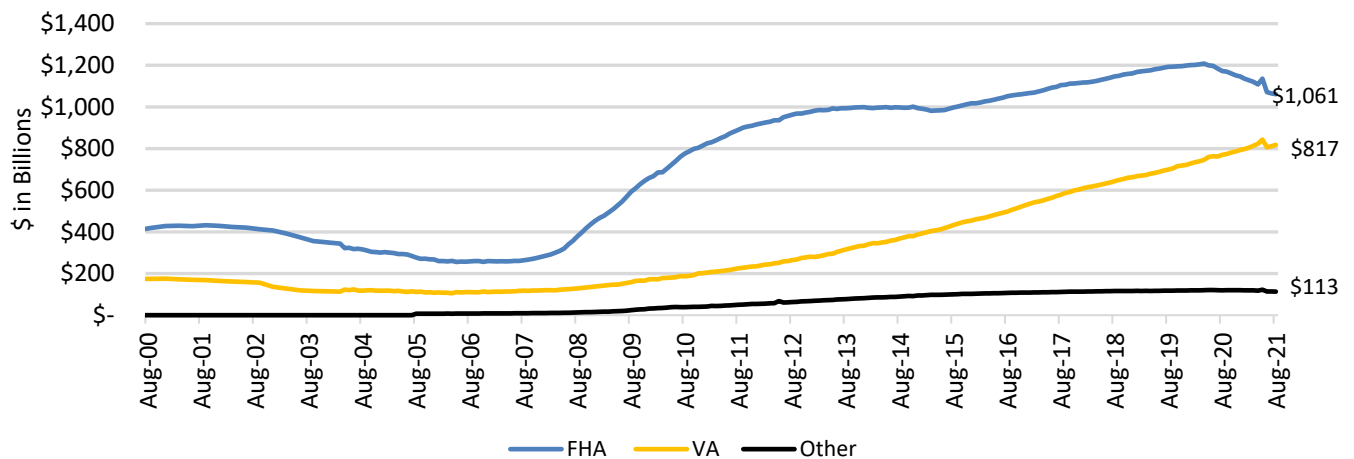
## 2.6 Outstanding Single Family Agency MBS

As of August 2021, according to the Agency MBS disclosure files, outstanding single family securities in the Agency market totaled \$7.46 trillion: 40.2% Fannie Mae, 33.2% Freddie Mac, and 26.6% Ginnie Mae MBS. Within the Ginnie Mae market, the composition of issuance has shifted in the past ten years, as FHA-insured single family loans as a percentage of MBS collateral have declined and the VA-guaranteed loan share has increased significantly. In August 2011, close to 77% of Ginnie Mae outstanding collateral was FHA and under 20% was VA. In August 2021, FHA collateral comprised 53% of Ginnie Mae MBS outstanding and VA collateral comprised 41% of Ginnie Mae MBS outstanding.

### Outstanding Agency Mortgage-Backed Securities



### Composition of Outstanding Ginnie Mae Mortgage-Backed Securities

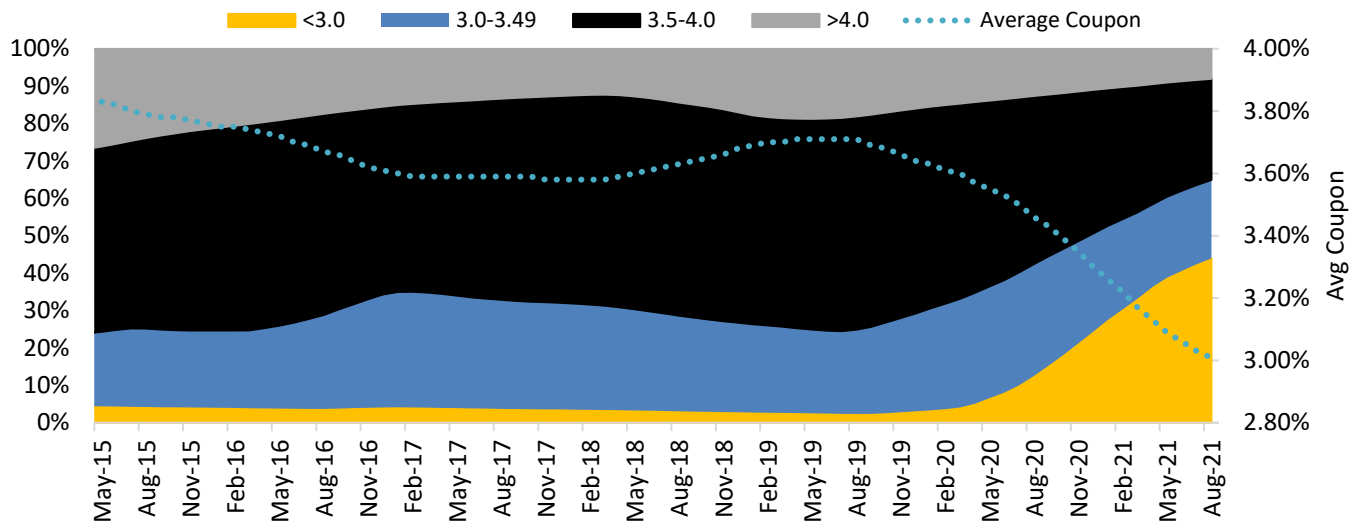


Sources: Data beginning in May 21 is based on outstanding balances in the Ginnie Mae/Freddie Mac/Fannie Mae Loan Level MBS Disclosure Files. Note: Data as of August 2021. Beginning with the October 2021 GMAR, the Fannie Mae and Freddie Mac data within the Outstanding Agency MBS graph have been updated to reflect the Current UPB of the portfolio. July 2021 through September 2021 GMAR reflect the UPB at Security issuance for Fannie Mae and Freddie Mac for data from May 2021 through July 2021.

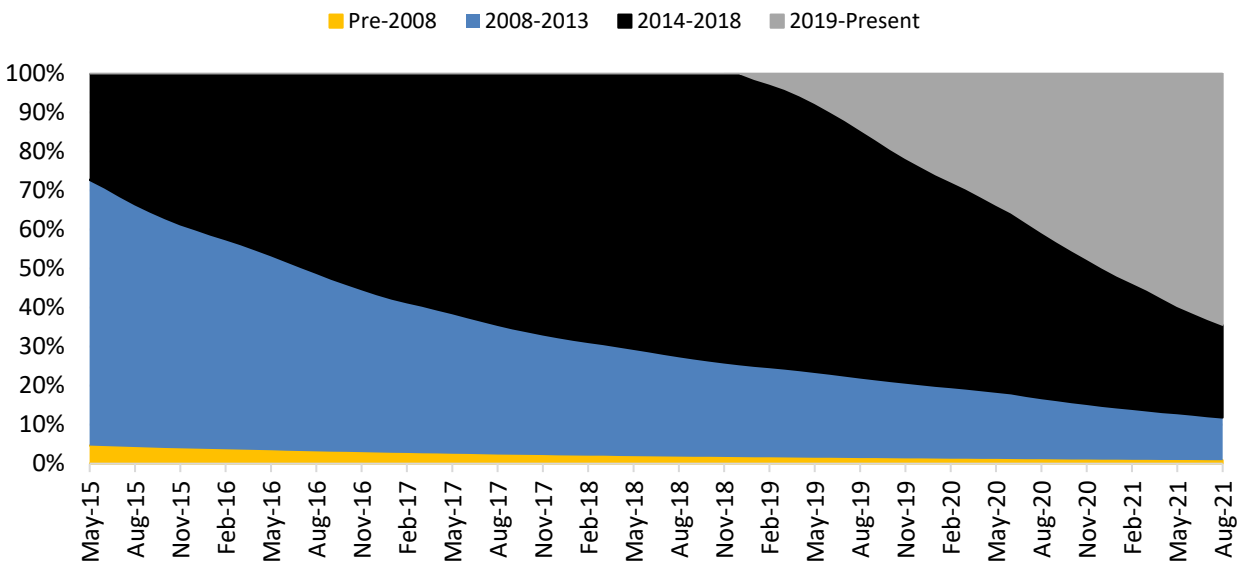
## 2.7 Outstanding Ginnie Mae MBS Volume by Coupon and Vintage Over Time

As of August 2021, the weighted average coupon on outstanding Ginnie Mae pools was 3.01%, down 2 bps since July. The share of outstanding MBS pools with coupons below 3.0% (44% as of August 2021) has grown since 2020 due to low interest rates and attendant refinance opportunities. The bottom chart illustrates that loans originated since 2014 comprise almost 90% of Ginnie MBS collateral outstanding, with loans originated since 2019 accounting for 65% of Ginnie MBS collateral outstanding.

### Outstanding Ginnie Balance, by Coupon



### Outstanding Ginnie Balance, by Vintage

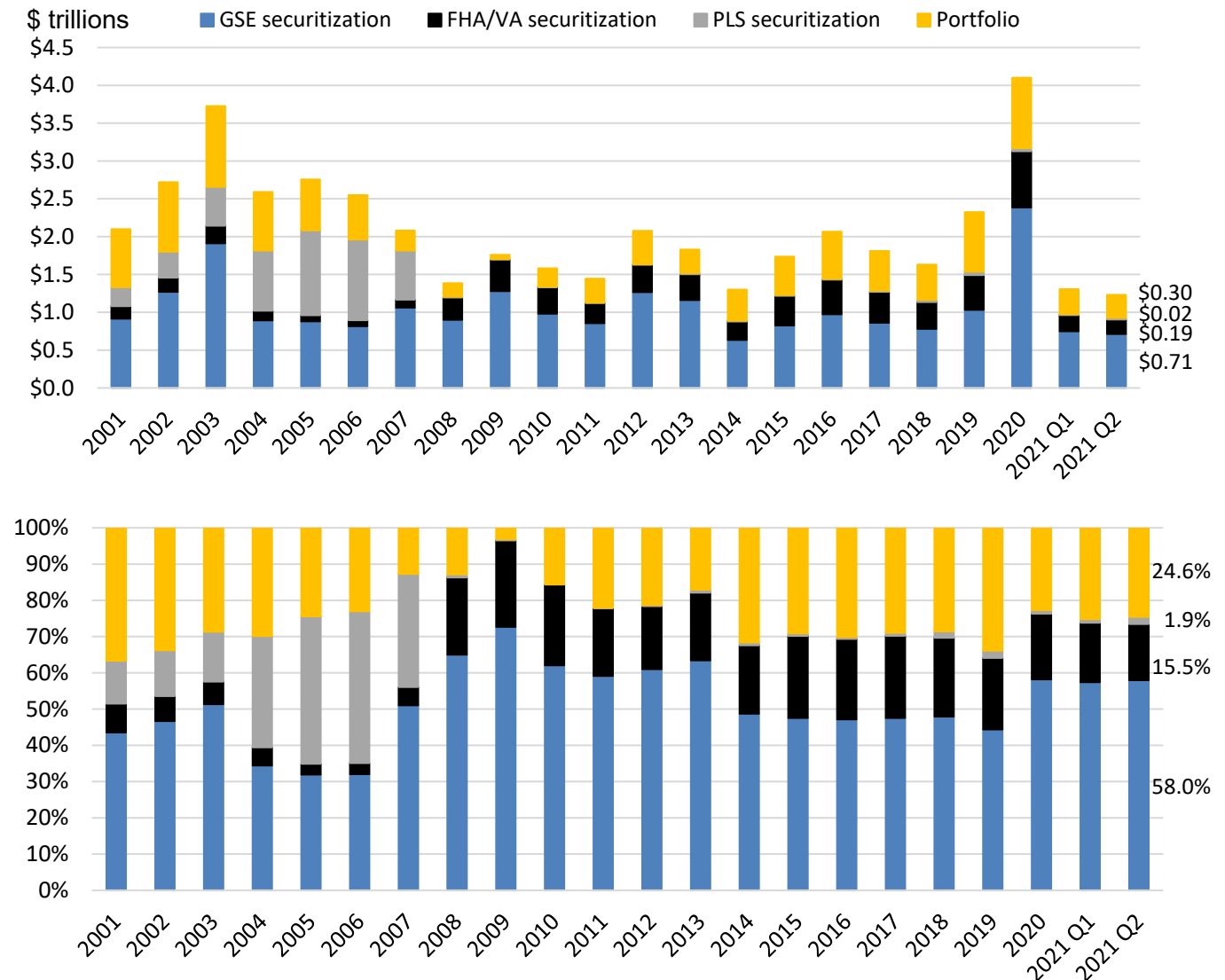


Sources: Ginnie Mae Pool Level MBS Disclosure Files. Note: August 2021 data points reflect the current composition of balances by coupon and vintage; factor data is not applied to prior date balance compositions. Average coupon is weighted by remaining principal balance.

## 2.8 Origination Volume and Share Over Time

Strong origination volume trends have continued in the first half of 2021, with \$2.54 trillion in originations, which outpaces Q1-Q2 2020 issuance by approximately 51%. Securitized first lien originations, comprised of GSE, Ginnie Mae, and Private Label securitizations, have increased from an 18-year low of 66% of total first lien originations in 2019 to 75% in Q2 2021. This overall increase in the share of securitized loans has happened despite a decrease in the share of securitization of Ginnie Mae collateral from approximately 20% of total first lien origination to under 16% in Q2 2021. GSE securitized first lien debt accounts for much of the increase in the share of securitized first lien originations since 2019, having increased from 44% in 2019 to 58% in Q2 2021.

### First Lien Origination Volume & Share



Source: Inside Mortgage Finance. Note: Data as of Q2 2021.

## 3.0 US Agency Market, Originations

In August, Agency gross issuance increased 13% MoM, despite a 3% decline in gross Ginnie Mae Issuance. Gross issuance increased approximately 19% for the GSEs in August, offsetting the 3% slowdown in Ginnie Mae issuance. Agency net issuance was approximately \$77.4 billion, which represents a 33% increase over the prior month, driven almost entirely by GSE increases. Ginnie Mae gross issuance through August outpaces that of the first eight months of 2020, \$588.0 billion to \$480.9 billion. This is despite a decrease in Ginnie Mae net issuance to below zero in 2021. Ginnie Mae net issuance from January through August 2020 fell from \$22.0 billion down to \$-11.1 billion over the same period in 2021. As noted in Section 2.6, VA production continues to outpace FHA.

| Agency Gross Issuance (\$ in billions) |            |             |           |            |           |
|--|------------|-------------|-----------|------------|-----------|
| Issuance Year                          | Fannie Mae | Freddie Mac | GSE Total | Ginnie Mae | Total     |
| 2000                                   | \$202.8    | \$157.9     | \$360.6   | \$102.2    | \$462.8   |
| 2001                                   | \$506.9    | \$378.2     | \$885.1   | \$171.5    | \$1,056.6 |
| 2002                                   | \$710.0    | \$529.0     | \$1,238.9 | \$169.0    | \$1,407.9 |
| 2003                                   | \$1,174.4  | \$700.5     | \$1,874.9 | \$213.1    | \$2,088.0 |
| 2004                                   | \$517.5    | \$355.2     | \$872.6   | \$119.2    | \$991.9   |
| 2005                                   | \$514.1    | \$379.9     | \$894.0   | \$81.4     | \$975.3   |
| 2006                                   | \$500.2    | \$352.9     | \$853.0   | \$76.7     | \$929.7   |
| 2007                                   | \$633.0    | \$433.3     | \$1,066.2 | \$94.9     | \$1,161.1 |
| 2008                                   | \$562.7    | \$348.7     | \$911.4   | \$267.6    | \$1,179.0 |
| 2009                                   | \$817.1    | \$462.9     | \$1,280.0 | \$451.3    | \$1,731.3 |
| 2010                                   | \$626.6    | \$377.0     | \$1,003.5 | \$390.7    | \$1,394.3 |
| 2011                                   | \$578.2    | \$301.2     | \$879.3   | \$315.3    | \$1,194.7 |
| 2012                                   | \$847.6    | \$441.3     | \$1,288.8 | \$405.0    | \$1,693.8 |
| 2013                                   | \$749.9    | \$426.7     | \$1,176.6 | \$393.6    | \$1,570.2 |
| 2014                                   | \$392.9    | \$258.0     | \$650.9   | \$296.3    | \$947.2   |
| 2015                                   | \$493.9    | \$351.9     | \$845.7   | \$436.3    | \$1,282.0 |
| 2016                                   | \$600.5    | \$391.1     | \$991.6   | \$508.2    | \$1,499.8 |
| 2017                                   | \$531.3    | \$345.9     | \$877.3   | \$455.6    | \$1,332.9 |
| 2018                                   | \$480.9    | \$314.1     | \$795.0   | \$400.6    | \$1,195.6 |
| 2019                                   | \$597.4    | \$445.2     | \$1,042.6 | \$508.6    | \$1,551.2 |
| 2020                                   | \$1,343.4  | \$1,064.1   | \$2,407.5 | \$775.4    | \$3,182.9 |
| 2021 YTD                               | \$993.4    | \$870.5     | \$1,863.8 | \$588.0    | \$2,451.8 |

| Ginnie Mae Gross Issuance (\$ in billions) |         |         |        |         |  |
|--|---------|---------|--------|---------|--|
| Issuance Year                              | FHA     | VA      | Other  | Total   |  |
| 2000                                       | \$80.2  | \$18.8  | \$3.2  | \$102.2 |  |
| 2001                                       | \$133.8 | \$34.7  | \$3.1  | \$171.5 |  |
| 2002                                       | \$128.6 | \$37.9  | \$2.5  | \$169.0 |  |
| 2003                                       | \$147.9 | \$62.7  | \$2.5  | \$213.1 |  |
| 2004                                       | \$85.0  | \$31.8  | \$2.5  | \$119.2 |  |
| 2005                                       | \$55.7  | \$23.5  | \$2.1  | \$81.4  |  |
| 2006                                       | \$51.2  | \$23.2  | \$2.3  | \$76.7  |  |
| 2007                                       | \$67.7  | \$24.2  | \$3.0  | \$94.9  |  |
| 2008                                       | \$221.7 | \$39.0  | \$6.9  | \$267.6 |  |
| 2009                                       | \$359.9 | \$74.6  | \$16.8 | \$451.3 |  |
| 2010                                       | \$304.9 | \$70.6  | \$15.3 | \$390.7 |  |
| 2011                                       | \$216.1 | \$82.3  | \$16.9 | \$315.3 |  |
| 2012                                       | \$253.4 | \$131.3 | \$20.3 | \$405.0 |  |
| 2013                                       | \$239.2 | \$132.2 | \$22.2 | \$393.6 |  |
| 2014                                       | \$163.9 | \$111.4 | \$21.0 | \$296.3 |  |
| 2015                                       | \$261.5 | \$155.6 | \$19.2 | \$436.3 |  |
| 2016                                       | \$281.8 | \$206.5 | \$19.9 | \$508.2 |  |
| 2017                                       | \$257.6 | \$177.8 | \$20.2 | \$455.6 |  |
| 2018                                       | \$222.6 | \$160.8 | \$17.2 | \$400.6 |  |
| 2019                                       | \$266.9 | \$225.7 | \$16.0 | \$508.6 |  |
| 2020                                       | \$327.0 | \$423.5 | \$24.9 | \$775.4 |  |
| 2021 YTD                                   | \$261.7 | \$308.9 | \$17.5 | \$588.0 |  |

# US Agency Market, Originations

| Agency Net Issuance (\$ in billions) |            |             |          |            |          |
|--------------------------------------|------------|-------------|----------|------------|----------|
| Issuance Year                        | Fannie Mae | Freddie Mac | GSE      | Ginnie Mae | Total    |
| 2000                                 | \$92.0     | \$67.8      | \$159.8  | \$29.3     | \$189.1  |
| 2001                                 | \$216.6    | \$151.8     | \$368.4  | -\$9.9     | \$358.5  |
| 2002                                 | \$218.9    | \$138.3     | \$357.2  | -\$51.2    | \$306.1  |
| 2003                                 | \$293.7    | \$41.1      | \$334.9  | -\$77.6    | \$257.3  |
| 2004                                 | \$32.3     | \$50.2      | \$82.5   | -\$40.1    | \$42.4   |
| 2005                                 | \$62.5     | \$111.7     | \$174.2  | -\$42.2    | \$132.0  |
| 2006                                 | \$164.3    | \$149.3     | \$313.6  | \$0.2      | \$313.8  |
| 2007                                 | \$296.1    | \$218.8     | \$514.9  | \$30.9     | \$545.7  |
| 2008                                 | \$213.0    | \$101.8     | \$314.8  | \$196.4    | \$511.3  |
| 2009                                 | \$208.1    | \$42.5      | \$250.6  | \$257.4    | \$508.0  |
| 2010                                 | -\$156.4   | -\$146.8    | -\$303.2 | \$198.3    | -\$105.0 |
| 2011                                 | -\$32.6    | -\$95.8     | -\$128.4 | \$149.6    | \$21.2   |
| 2012                                 | \$32.9     | -\$75.3     | -\$42.4  | \$119.1    | \$76.8   |
| 2013                                 | \$53.5     | \$11.8      | \$65.3   | \$89.6     | \$154.9  |
| 2014                                 | -\$4.0     | \$30.0      | \$26.0   | \$61.6     | \$87.7   |
| 2015                                 | \$3.5      | \$65.0      | \$68.4   | \$97.3     | \$165.7  |
| 2016                                 | \$60.5     | \$66.8      | \$127.4  | \$126.1    | \$253.5  |
| 2017                                 | \$83.7     | \$77.0      | \$160.7  | \$132.3    | \$293.0  |
| 2018                                 | \$81.9     | \$67.6      | \$149.4  | \$112.0    | \$261.5  |
| 2019                                 | \$87.4     | \$110.3     | \$197.7  | \$95.7     | \$293.5  |
| 2020                                 | \$289.3    | \$343.5     | \$632.8  | \$19.9     | \$652.7  |
| 2021 YTD                             | \$260.6    | \$336.1     | \$596.7  | -\$11.1    | \$585.6  |

| Ginnie Mae Net Issuance (\$ in billions) |         |         |        |         |
|--|---------|---------|--------|---------|
| Issuance Year                            | FHA     | VA      | Other  | Total   |
| 2000                                     | \$29.0  | \$0.3   | \$0.0  | \$29.3  |
| 2001                                     | \$0.7   | -\$10.6 | \$0.0  | -\$9.9  |
| 2002                                     | -\$22.5 | -\$28.7 | \$0.0  | -\$51.2 |
| 2003                                     | -\$56.5 | -\$21.1 | \$0.0  | -\$77.6 |
| 2004                                     | -\$45.2 | \$5.1   | \$0.0  | -\$40.1 |
| 2005                                     | -\$37.3 | -\$12.1 | \$7.2  | -\$42.2 |
| 2006                                     | -\$4.7  | \$3.8   | \$1.2  | \$0.2   |
| 2007                                     | \$20.2  | \$8.7   | \$2.0  | \$30.9  |
| 2008                                     | \$173.3 | \$17.7  | \$5.4  | \$196.4 |
| 2009                                     | \$206.4 | \$35.1  | \$15.8 | \$257.4 |
| 2010                                     | \$158.6 | \$29.6  | \$10.0 | \$198.3 |
| 2011                                     | \$102.8 | \$34.0  | \$12.8 | \$149.6 |
| 2012                                     | \$58.9  | \$45.9  | \$14.3 | \$119.1 |
| 2013                                     | \$20.7  | \$53.3  | \$13.9 | \$87.9  |
| 2014                                     | -\$4.8  | \$53.9  | \$12.5 | \$61.6  |
| 2015                                     | \$22.5  | \$66.9  | \$7.9  | \$97.3  |
| 2016                                     | \$45.6  | \$73.2  | \$6.0  | \$124.9 |
| 2017                                     | \$50.1  | \$76.1  | \$5.0  | \$131.2 |
| 2018                                     | \$49.2  | \$61.2  | \$3.5  | \$113.9 |
| 2019                                     | \$35.9  | \$58.0  | \$1.9  | \$95.7  |
| 2020                                     | -\$52.5 | \$71.0  | \$1.3  | \$19.9  |
| 2021 YTD                                 | -\$59.3 | \$52.8  | -\$4.6 | -\$11.1 |





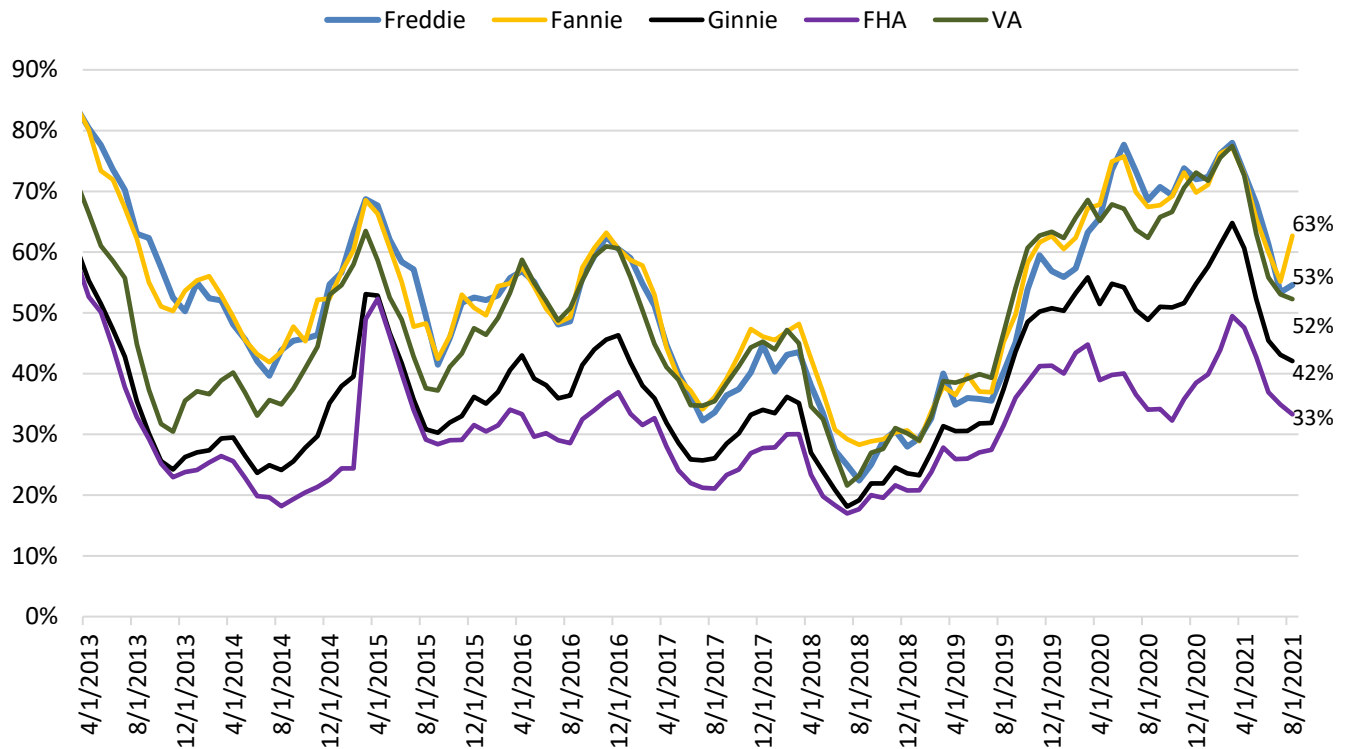
# US Agency Market, Originations

| Month  | Agency Gross Issuance Amount (in \$ Billions) |             |            |         |         | Agency Net Issuance Amount (in \$ Billions) |             |            |         |         |
|--------|---|-------------|------------|---------|---------|---|-------------|------------|---------|---------|
|        | Fannie Mae                                    | Freddie Mac | Ginnie Mae | GSEs    | Total   | Fannie Mae                                  | Freddie Mac | Ginnie Mae | GSEs    | Total   |
| Jan-17 | \$55.6  | \$38.5      | \$42.6     | \$94.1  | \$136.6 | \$8.5                                       | \$10.7      | \$10.3     | \$19.2  | \$29.5  |
| Feb-17 | \$37.6  | \$27.4      | \$33.1     | \$65.0  | \$98.1  | \$2.5                                       | \$6.5       | \$9.4      | \$9.0   | \$18.5  |
| Mar-17 | \$39.5  | \$24.4      | \$31.3     | \$63.9  | \$95.2  | \$9.7                                       | \$6.2       | \$9.7      | \$15.9  | \$25.6  |
| Apr-17 | \$39.3  | \$21.2      | \$36.4     | \$60.6  | \$97.0  | \$3.3                                       | \$0.4       | \$11.7     | \$3.7   | \$15.4  |
| May-17 | \$40.3  | \$22.6      | \$36.4     | \$62.9  | \$99.3  | \$7.7                                       | \$2.7       | \$13.3     | \$10.4  | \$23.8  |
| Jun-17 | \$45.7  | \$25.1      | \$39.9     | \$70.8  | \$110.7 | \$7.9                                       | \$2.4       | \$13.3     | \$10.3  | \$23.5  |
| Jul-17 | \$45.3  | \$27.6      | \$40.6     | \$72.9  | \$113.5 | \$5.6                                       | \$3.5       | \$12.3     | \$9.2   | \$21.5  |
| Aug-17 | \$49.1  | \$29.3      | \$42.8     | \$78.4  | \$121.1 | \$12.0                                      | \$6.7       | \$15.4     | \$18.7  | \$34.1  |
| Sep-17 | \$47.3  | \$27.9      | \$40.2     | \$75.3  | \$115.5 | \$7.7                                       | \$3.8       | \$10.6     | \$11.4  | \$22.0  |
| Oct-17 | \$42.9  | \$34.6      | \$38.4     | \$77.6  | \$115.9 | \$5.5                                       | \$12.5      | \$11.0     | \$17.9  | \$28.9  |
| Nov-17 | \$43.5  | \$37.2      | \$37.8     | \$80.7  | \$118.5 | \$3.9                                       | \$13.6      | \$8.3      | \$17.5  | \$25.8  |
| Dec-17 | \$45.3  | \$30.0      | \$36.2     | \$75.3  | \$111.5 | \$9.2                                       | \$8.1       | \$7.0      | \$17.4  | \$24.4  |
| Jan-18 | \$47.4  | \$21.4      | \$35.4     | \$68.8  | \$104.2 | \$12.1                                      | \$0.2       | \$7.7      | \$12.3  | \$20.0  |
| Feb-18 | \$40.3  | \$21.5      | \$32.0     | \$61.8  | \$93.8  | \$8.3                                       | \$2.2       | \$7.1      | \$10.5  | \$17.6  |
| Mar-18 | \$35.6  | \$21.3      | \$29.1     | \$56.9  | \$86.0  | \$4.9                                       | \$3.0       | \$6.3      | \$7.9   | \$14.1  |
| Apr-18 | \$36.3  | \$26.2      | \$32.8     | \$62.5  | \$95.3  | \$1.7                                       | \$6.0       | \$8.8      | \$7.7   | \$16.5  |
| May-18 | \$38.9  | \$27.5      | \$33.8     | \$66.4  | \$100.2 | \$5.1                                       | \$7.2       | \$10.5     | \$12.3  | \$22.8  |
| Jun-18 | \$38.2  | \$28.8      | \$35.6     | \$67.0  | \$102.6 | \$2.5                                       | \$6.8       | \$10.3     | \$9.3   | \$19.6  |
| Jul-18 | \$40.3  | \$26.2      | \$35.6     | \$66.5  | \$102.2 | \$4.2                                       | \$3.7       | \$10.4     | \$7.8   | \$18.3  |
| Aug-18 | \$50.4  | \$29.9      | \$37.5     | \$80.3  | \$117.8 | \$15.8                                      | \$7.9       | \$12.5     | \$23.6  | \$36.1  |
| Sep-18 | \$41.8  | \$30.1      | \$34.8     | \$71.8  | \$106.6 | \$5.9                                       | \$6.2       | \$9.0      | \$12.1  | \$21.1  |
| Oct-18 | \$39.8  | \$27.4      | \$33.2     | \$67.1  | \$100.3 | \$9.7                                       | \$7.1       | \$11.4     | \$16.8  | \$28.2  |
| Nov-18 | \$35.1  | \$30.1      | \$32.4     | \$65.2  | \$97.6  | \$3.6                                       | \$11.0      | \$9.8      | \$14.6  | \$24.4  |
| Dec-18 | \$36.9  | \$23.9      | \$28.4     | \$60.7  | \$89.1  | \$8.2                                       | \$6.4       | \$8.2      | \$14.6  | \$22.8  |
| Jan-19 | \$33.3  | \$19.2      | \$29.0     | \$52.6  | \$81.6  | \$5.9                                       | \$2.5       | \$9.2      | \$8.3   | \$17.6  |
| Feb-19 | \$27.3  | \$19.9      | \$23.5     | \$47.2  | \$70.7  | \$1.4                                       | \$3.4       | \$4.6      | \$4.7   | \$9.3   |
| Mar-19 | \$29.6  | \$27.3      | \$26.6     | \$56.9  | \$83.5  | \$1.8                                       | \$10.3      | \$5.6      | \$12.0  | \$17.6  |
| Apr-19 | \$33.1  | \$30.8      | \$32.9     | \$63.9  | \$96.8  | \$1.3                                       | \$10.8      | \$8.3      | \$12.0  | \$20.4  |
| May-19 | \$44.5  | \$34.3      | \$38.8     | \$78.8  | \$117.6 | \$6.7                                       | \$9.8       | \$9.4      | \$16.6  | \$26.0  |
| Jun-19 | \$44.6  | \$34.0      | \$43.3     | \$78.6  | \$121.9 | \$1.9                                       | \$5.9       | \$9.0      | \$7.8   | \$16.8  |
| Jul-19 | \$51.7  | \$36.9      | \$45.9     | \$88.6  | \$134.5 | \$10.9                                      | \$10.1      | \$11.0     | \$21.0  | \$32.0  |
| Aug-19 | \$71.1  | \$50.4      | \$51.2     | \$121.4 | \$172.6 | \$20.8                                      | \$17.1      | \$8.7      | \$37.9  | \$46.6  |
| Sep-19 | \$67.1  | \$43.0      | \$52.0     | \$110.1 | \$162.1 | \$14.1                                      | \$7.5       | \$6.5      | \$21.5  | \$28.0  |
| Oct-19 | \$65.0  | \$46.2      | \$58.4     | \$111.2 | \$169.6 | \$4.4                                       | \$7.1       | \$11.9     | \$14.6  | \$26.5  |
| Nov-19 | \$68.1  | \$50.7      | \$54.3     | \$118.7 | \$173.1 | \$5.2                                       | \$8.6       | \$4.1      | \$13.8  | \$18.0  |
| Dec-19 | \$62.1  | \$52.5      | \$52.7     | \$114.6 | \$167.3 | \$10.1                                      | \$17.3      | \$7.4      | \$27.3  | \$34.7  |
| Jan-20 | \$61.7  | \$51.4      | \$56.0     | \$113.1 | \$169.0 | \$9.1                                       | \$16.5      | \$8.6      | \$25.6  | \$34.2  |
| Feb-20 | \$56.5  | \$39.5      | \$51.2     | \$96.0  | \$147.2 | \$9.4                                       | \$7.9       | \$7.1      | \$17.4  | \$24.4  |
| Mar-20 | \$69.5  | \$41.4      | \$53.0     | \$110.8 | \$163.9 | \$17.9                                      | \$6.3       | \$8.8      | \$24.2  | \$33.0  |
| Apr-20 | \$101.6                                       | \$76.3      | \$61.4     | \$177.9 | \$239.3 | \$30.5                                      | \$27.5      | \$10.2     | \$58.0  | \$68.2  |
| May-20 | \$124.3                                       | \$70.6      | \$60.8     | \$194.9 | \$255.7 | \$35.2                                      | \$8.2       | \$5.7      | \$43.4  | \$49.1  |
| Jun-20 | \$118.9                                       | \$78.1      | \$58.5     | \$197.0 | \$255.4 | \$30.0                                      | \$15.9      | \$1.3      | \$45.9  | \$47.2  |
| Jul-20 | \$125.0                                       | \$108.1     | \$66.5     | \$233.1 | \$299.5 | \$23.4                                      | \$38.0      | -\$15.5    | \$61.4  | \$45.9  |
| Aug-20 | \$137.6                                       | \$113.6     | \$73.6     | \$251.3 | \$324.8 | \$34.2                                      | \$43.4      | -\$4.1     | \$77.6  | \$73.5  |
| Sep-20 | \$122.9                                       | \$102.1     | \$72.4     | \$225.0 | \$297.5 | \$16.5                                      | \$29.9      | \$1.0      | \$46.5  | \$47.5  |
| Oct-20 | \$142.3                                       | \$124.8     | \$72.6     | \$267.1 | \$339.7 | \$28.9                                      | \$48.3      | -\$0.3     | \$77.2  | \$76.9  |
| Nov-20 | \$152.4                                       | \$131.5     | \$72.6     | \$283.9 | \$356.5 | \$31.4                                      | \$48.4      | -\$4.5     | \$79.8  | \$75.3  |
| Dec-20 | \$130.8                                       | \$126.7     | \$76.9     | \$257.5 | \$334.4 | \$22.8                                      | \$53.1      | \$1.7      | \$75.8  | \$77.5  |
| Jan-21 | \$141.6                                       | \$117.3     | \$78.2     | \$258.9 | \$337.1 | \$25.9                                      | \$37.9      | -\$6.5     | \$63.8  | \$57.3  |
| Feb-21 | \$118.8                                       | \$115.5     | \$72.3     | \$234.3 | \$306.6 | \$16.8                                      | \$44.3      | -\$0.9     | \$61.1  | \$60.2  |
| Mar-21 | \$143.9                                       | \$118.9     | \$76.9     | \$262.8 | \$339.7 | \$37.6                                      | \$44.0      | \$1.0      | \$81.6  | \$82.6  |
| Apr-21 | \$148.0                                       | \$142.3     | \$85.6     | \$290.3 | \$375.9 | \$26.2                                      | \$57.0      | -\$4.2     | \$83.3  | \$79.0  |
| May-21 | \$132.3                                       | \$91.4      | \$71.7     | \$223.7 | \$295.4 | \$64.9                                      | \$38.8      | -\$3.1     | \$103.7 | \$100.6 |
| Jun-21 | \$108.5                                       | \$91.2      | \$67.7     | \$199.7 | \$267.4 | \$34.0                                      | \$33.7      | \$2.6      | \$67.8  | \$70.4  |
| Jul-21 | \$95.4  | \$84.6      | \$69.0     | \$180.0 | \$249.0 | \$27.6                                      | \$31.9      | -\$1.4     | \$59.5  | \$58.0  |
| Aug-21 | \$104.8                                       | \$109.3     | \$66.6     | \$214.1 | \$280.8 | \$27.5                                      | \$48.5      | \$1.4      | \$76.1  | \$77.4  |

Source: Beginning May 2021, data for Gross and Net Issuance was sourced from Fannie Mae, Freddie Mac, and Ginnie Mae loan level disclosure files. Net issuance is defined here as the difference between prior period UPB and current period UPB. Data as of August 2021. Beginning with the October 2021 GMAR, the Fannie Mae and Freddie Mac net issuance data have been updated to reflect the current UPB of the portfolios. July 2021 through September 2021 GMAR net issuance data reflect the UPB at security issuance for Fannie Mae and Freddie Mac for data from May 2021 through July 2021.

The FHA refinance share stood at 33% in August 2021, below the 63% share for Fannie, the 53% refi share for Freddie originations, and the 52% share for the VA. The total Ginnie refinance share stood at 42% in August. Refinances as a share of all originations rebounded to 55% in August after having dropped from 57% to 51% from June to July. This interrupts the trend of refinances representing a decreasing proportion of overall issuance since recent refinance peaks in early 2021 and mid-2020.

## Percent Refi at Issuance



Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: Data as of August 2021.

## 4.0 High LTV Loans: Ginnie Mae vs. GSEs

The share of high-LTV Agency loans going to borrowers with FICO scores above 750 has increased by 4% from Q3 2019 to Q3 2021. The share of borrowers with DTIs below 35% has decreased by approximately 2% over the same period. The share of high-LTV loans decreased in both Ginnie Mae and GSEs portfolio by approximately 3% and 28%, respectively, from Q3 2019 to Q3 2021. Still, Ginnie Mae maintains its key role of expanding credit access to low-to-moderate income borrowers as it continues to dominate high-LTV lending, with 62.63% of its issuances in Q3 2021 having LTVs of 95 or above, compared to 4.74% for the GSEs. Notably, the percent of GSE issuances with LTVs of 95 or above dropped from 9.53% during the period of June 2021 to August 2021 to 4.74% during the period of July 2021 to September 2021.

### Share of Loans with LTV $\geq$ 95

|                       | Ginnie Mae | GSE   | All    |
|-----------------------|------------|-------|--------|
| July 2019 - Sept 2019 | 64.60%     | 6.61% | 26.68% |
| July 2021 - Sept 2021 | 62.63%     | 4.74% | 21.53% |

### Agency Market Share by DTI and FICO for Loans with LTV $\geq$ 95

#### July – Sept 2021

| DTI       | FICO   |         |         |            | NA     | All     |
|-----------|--------|---------|---------|------------|--------|---------|
|           | <650   | 650-700 | 700-750 | $\geq$ 750 |        |         |
| <35       | 4.36%  | 6.00%   | 3.17%   | 5.12%      | 1.17%  | 19.83%  |
| 35-45     | 6.45%  | 8.51%   | 3.87%   | 3.96%      | 0.24%  | 23.02%  |
| $\geq$ 45 | 5.14%  | 7.88%   | 3.70%   | 3.13%      | 0.16%  | 20.01%  |
| NA        | 5.05%  | 6.66%   | 4.34%   | 7.17%      | 13.93% | 37.15%  |
| All       | 21.00% | 29.06%  | 15.08%  | 19.38%     | 15.49% | 100.00% |

#### July - Sept 2019

| DTI       | FICO   |         |         |            | NA     | All     |
|-----------|--------|---------|---------|------------|--------|---------|
|           | <650   | 650-700 | 700-750 | $\geq$ 750 |        |         |
| <35       | 4.47%  | 6.16%   | 3.39%   | 4.96%      | 1.30%  | 20.22%  |
| 35-45     | 6.65%  | 8.71%   | 4.26%   | 4.30%      | 0.20%  | 24.05%  |
| $\geq$ 45 | 5.26%  | 8.02%   | 4.05%   | 3.46%      | 0.13%  | 20.82%  |
| NA        | 5.52%  | 7.09%   | 4.27%   | 5.91%      | 11.90% | 34.91%  |
| All       | 21.90% | 29.97%  | 15.98%  | 18.62%     | 13.52% | 100.00% |

Sources: eMBS, Recursion and Ginnie Mae. Data as of September 2021.



# Holders of Ginnie Mae Mortgage Servicing Rights

## 5.0 Holders of Ginnie Mae Mortgage Servicing Rights

This table shows the 30 largest owners of mortgage servicing rights (MSR) by UPB for Ginnie Mae MBS. The top 30 firms collectively own 81.99% of Ginnie Mae MSRs (see Cumulative Share). Twenty-two of these top 30 are non-depository institutions, the remaining 8 are depository institutions. As of September 2021, over half (51.2%) of the Ginnie Mae MSRs are owned by the top six firms.

**Top 30 Holders of Ginnie Mae Mortgage Servicing Rights (MSRs), by UPB**

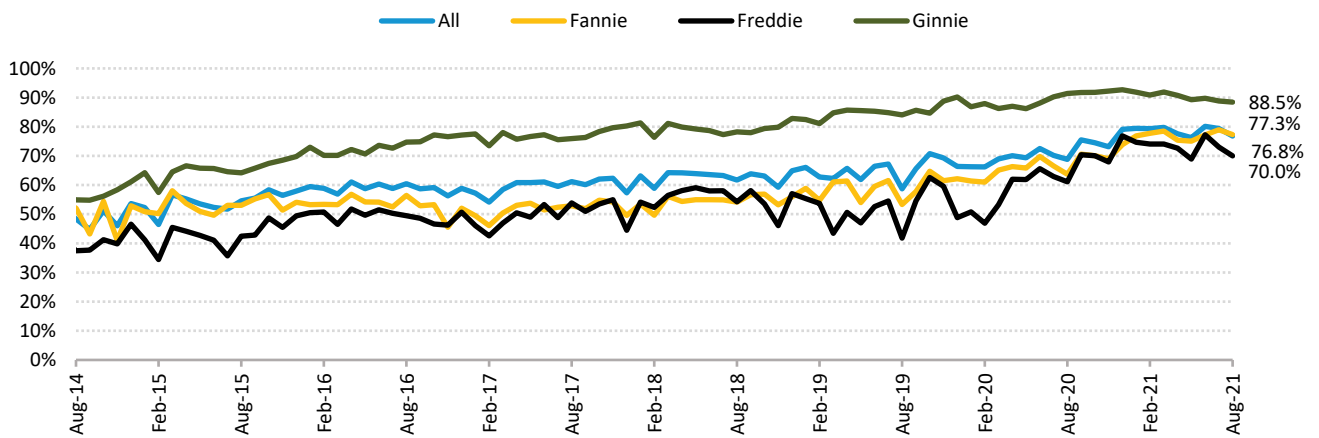
| Rank | MSR Holder                            | UPB (\$ millions) | Share  | Cumulative Share |
|------|---------------------------------------|-------------------|--------|------------------|
| 1    | Freedom Home Mortgage                 | \$262,291         | 13.54% | 13.54%           |
| 2    | PennyMac                              | \$215,411         | 11.12% | 24.67%           |
| 3    | Lakeview                              | \$201,409         | 10.40% | 35.07%           |
| 4    | Wells Fargo                           | \$129,892         | 6.71%  | 41.77%           |
| 5    | Rocket Mortgage                       | \$95,964          | 4.96%  | 46.73%           |
| 6    | Nationstar                            | \$87,339          | 4.51%  | 51.24%           |
| 7    | Newrez                                | \$58,668          | 3.03%  | 54.27%           |
| 8    | US Bank                               | \$47,624          | 2.46%  | 56.73%           |
| 9    | Caliber Home Loans                    | \$47,104          | 2.43%  | 59.16%           |
| 10   | Carrington Mortgage                   | \$44,470          | 2.30%  | 61.46%           |
| 11   | United Wholesale Mortgage             | \$38,656          | 2.00%  | 63.45%           |
| 12   | USAA Federal Savings Bank             | \$34,345          | 1.77%  | 65.22%           |
| 13   | Loan Depot                            | \$31,470          | 1.62%  | 66.85%           |
| 14   | Navy Federal Credit Union             | \$28,463          | 1.47%  | 68.32%           |
| 15   | Mortgage Research Center              | \$28,409          | 1.47%  | 69.79%           |
| 16   | Planet Home Lending                   | \$26,439          | 1.37%  | 71.15%           |
| 17   | Truist Bank                           | \$23,053          | 1.19%  | 72.34%           |
| 18   | The Money Source                      | \$21,626          | 1.12%  | 73.46%           |
| 19   | Guild Mortgage                        | \$20,177          | 1.04%  | 74.50%           |
| 20   | Home Point Financial Corporation      | \$16,881          | 0.87%  | 75.37%           |
| 21   | Crosscountry Mortgage                 | \$14,355          | 0.74%  | 76.11%           |
| 22   | Midfirst Bank                         | \$14,301          | 0.74%  | 76.85%           |
| 23   | New American Funding                  | \$14,296          | 0.74%  | 77.59%           |
| 24   | Village Capital                       | \$13,499          | 0.70%  | 78.29%           |
| 25   | Citizens Bank                         | \$12,836          | 0.66%  | 78.95%           |
| 26   | Idaho Housing and Finance Association | \$12,418          | 0.64%  | 79.59%           |
| 27   | JP Morgan Chase                       | \$12,201          | 0.63%  | 80.22%           |
| 28   | PHH Mortgage Corporation              | \$11,904          | 0.61%  | 80.84%           |
| 29   | CMG Mortgage, INC                     | \$11,614          | 0.60%  | 81.44%           |
| 30   | Rushmore Loan Management              | \$10,729          | 0.55%  | 81.99%           |

Source: Deloitte and Ginnie Mae. Data as of September 2021.

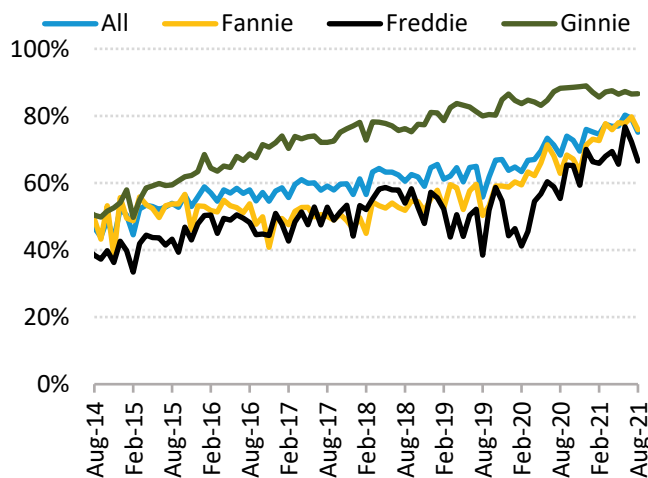
## 6.0 Agency Nonbank Originators

Total Agency nonbank origination experienced its second consecutive month of decline, down approximately 3% from July 2021. This decline in nonbank origination share was driven primarily by Freddie Mac (nonbank origination share down 3% MoM). The Ginnie Mae nonbank share has been consistently higher than the GSEs, at 88.5% in August 2021. Ginnie Mae nonbank origination share of refinance mortgage loans has continued to drive Ginnie Mae’s relatively higher nonbank origination share. GSE origination volume of purchase mortgage loans has been the primary driver in the MoM decline of Agency nonbank origination share.

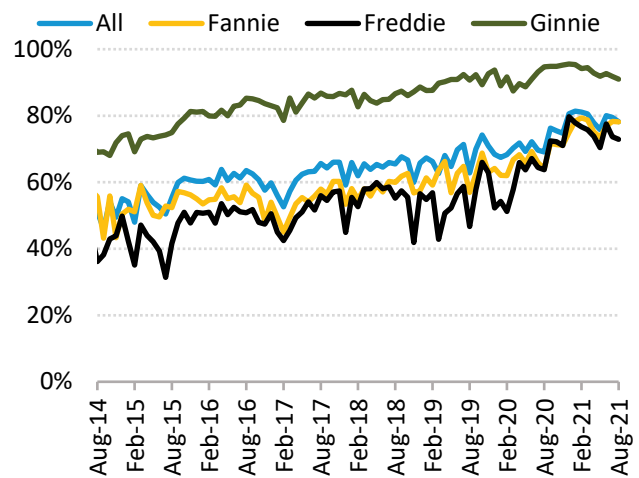
### 6.1 Agency Nonbank Originator Share (All, Purchase, Refi)



Nonbank Origination Share: Purchase Loans



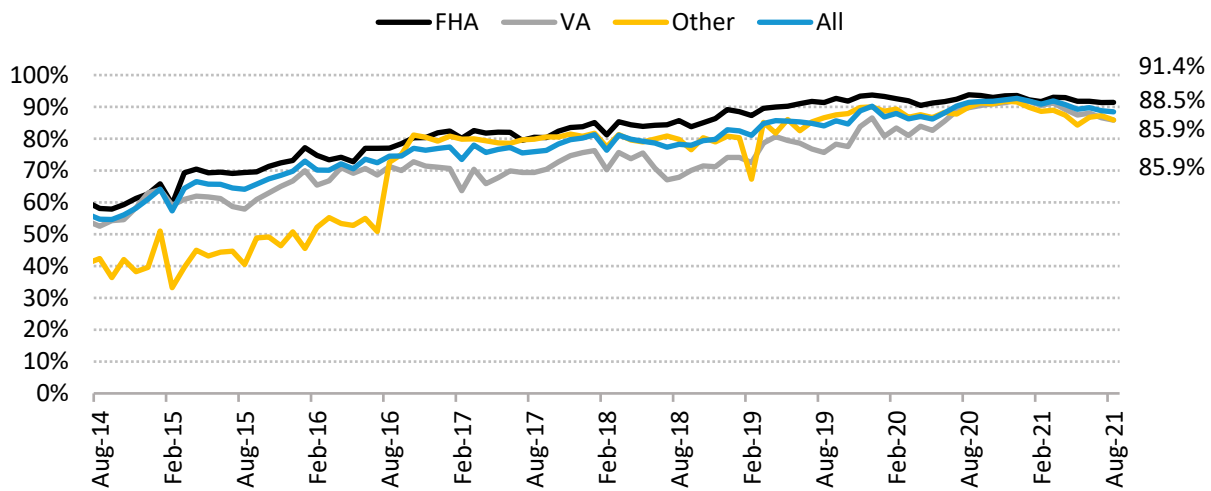
Nonbank Origination Share: Refi Loans



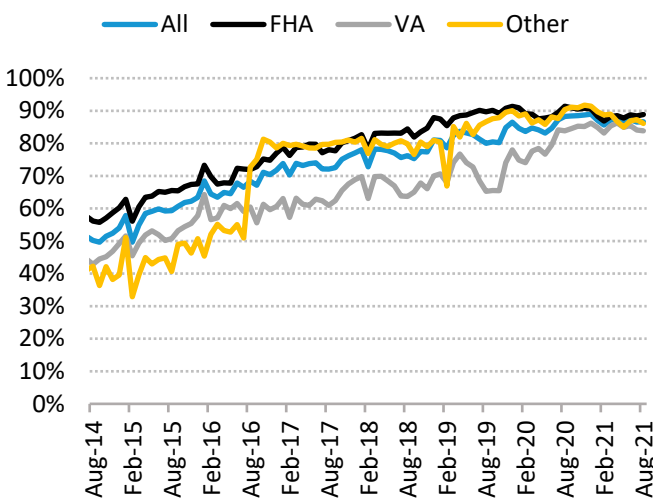
Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: Data as of August 2021.

Ginnie Mae’s total nonbank originator share declined for the second consecutive month, down approximately 0.4% MoM. This drop in Ginnie Mae nonbank origination share was driven primarily by VA and PIH- and RD-insured (“Other”) origination, while FHA-insured loans increased nonbank origination share in August. In August 2021 there was a slight decline in nonbank origination share for refi loans and a slight increase for purchase loans. The decline in nonbank origination share for refi loans was primarily driven by Other loans, with an approximately 4% decline MoM.

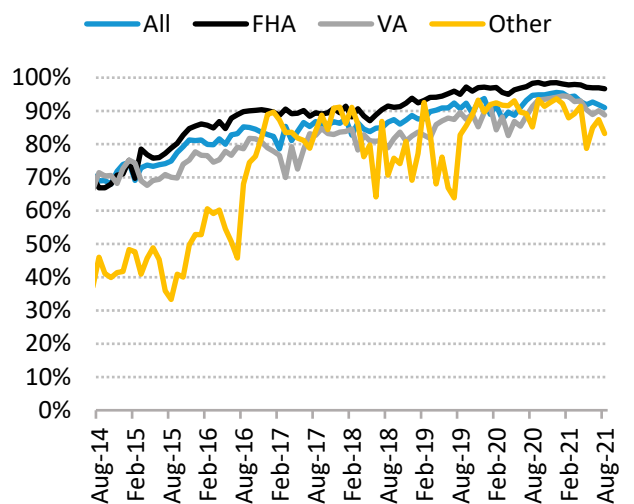
## 6.2 Ginnie Mae Nonbank Originator Share (All, Purchase, Refi)



### Ginnie Mae Nonbank Share: Purchase Loans



### Ginnie Mae Nonbank Share: Refi Loans

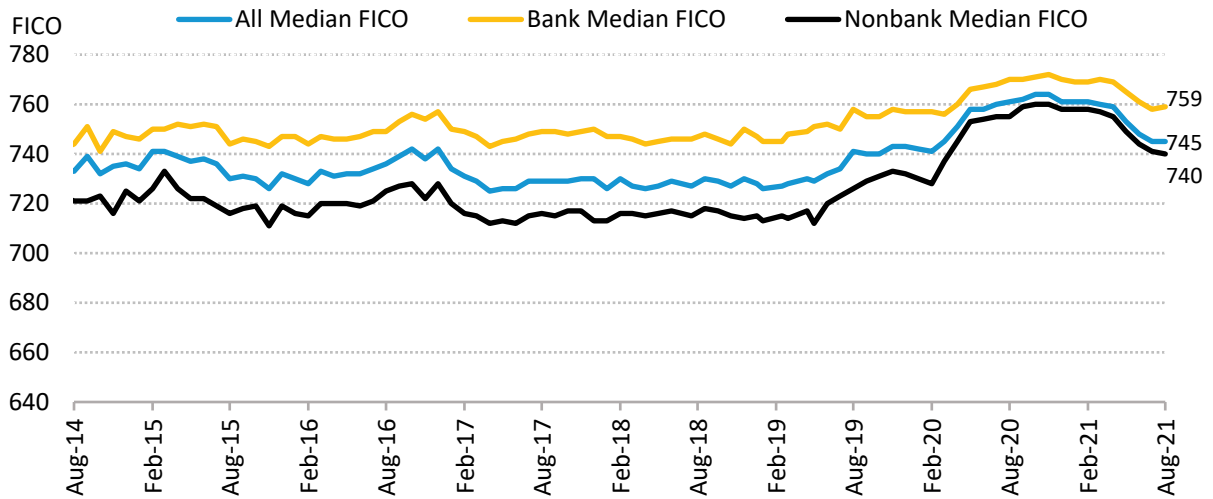


Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: “Other” refers to loans guaranteed by HUD’s Office of Public and Indian Housing and the Department of Agriculture’s Rural Development. Data as of August 2021.

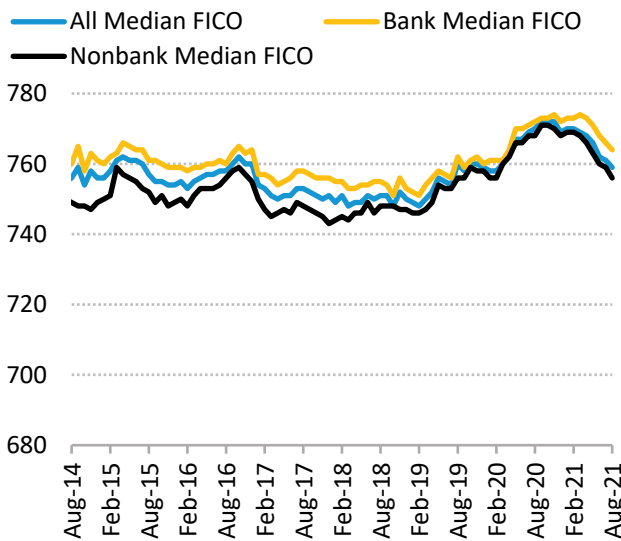
## 6.3 Bank vs. Nonbank Originators Historical Credit Box, Ginnie Mae vs. GSE (FICO, LTV, DTI)

The mortgage loan originations of nonbanks continue to have consistently lower median FICO score than their bank counterparts across all Agencies. The spread between nonbank and bank FICO scores grew by 2 points from July 2021 to August 2021. The Agency median FICO remained flat at 745 MoM.

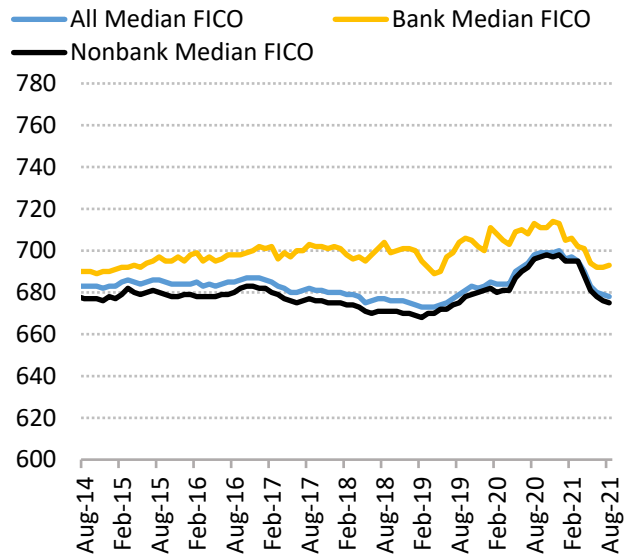
**Agency FICO: Bank vs. Nonbank**



**GSE FICO: Bank vs. Nonbank**



**Ginnie Mae FICO: Bank vs. Nonbank**



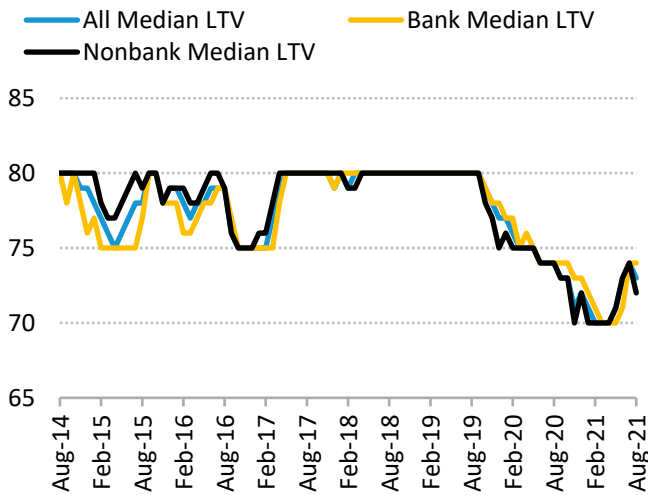
Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: Data as of August 2021.



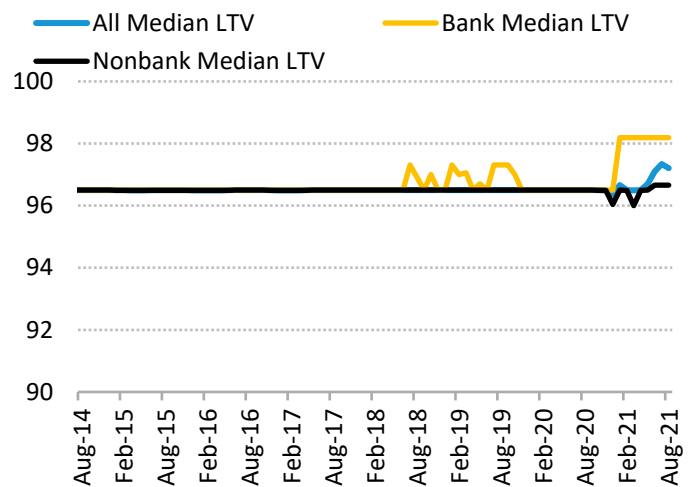
# Agency Nonbank Originators

The median LTV for GSE bank and nonbank originators declined in August 2021 for the first time since February 2021. Ginnie Mae median LTV also had a slight MoM decline. The decline in the GSEs' median LTV in August is attributable to the high volume of refis in the GSE space (see Section 3.0). Ginnie Mae median DTI experienced a slight MoM uptick in August 2021, driven by nonbank originations.

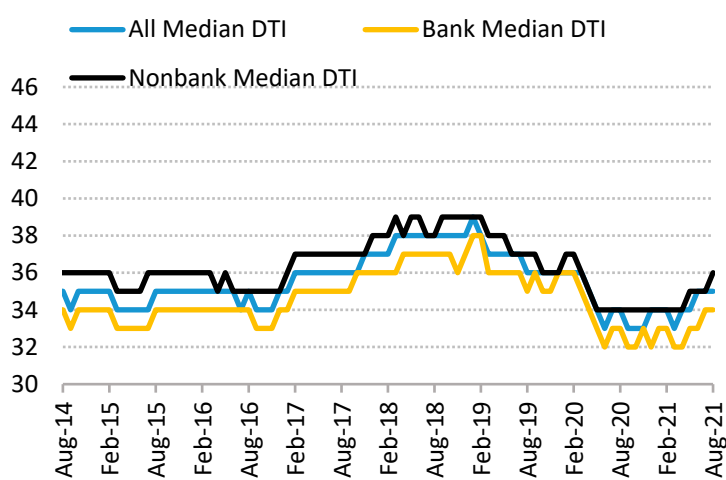
**GSE LTV: Bank vs Nonbank**



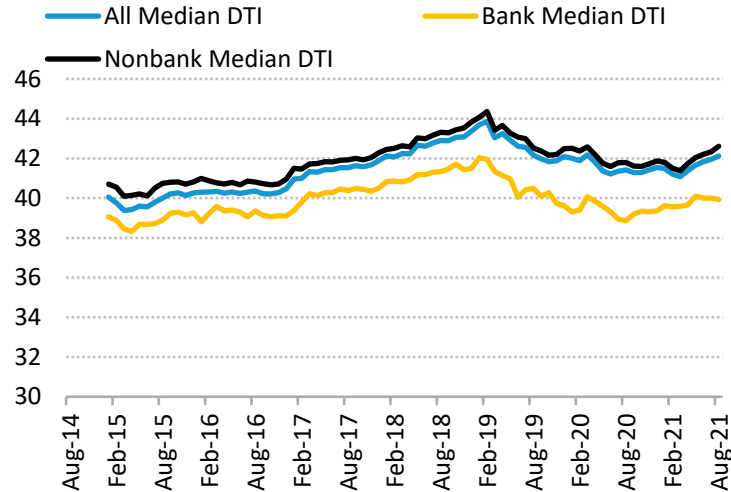
**Ginnie Mae LTV: Bank vs. Nonbank**



**GSE DTI: Bank vs Nonbank**



**Ginnie Mae DTI: Bank vs. Nonbank**

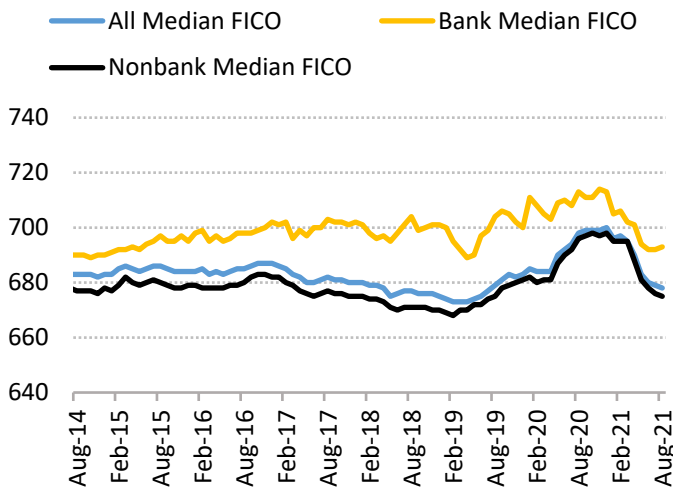


Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: Data as of August 2021.

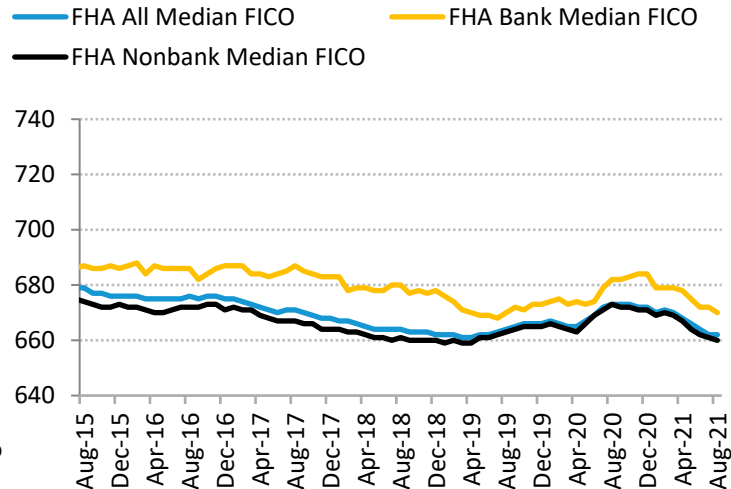
# Agency Nonbank Originators

August 2021 marked the sixth consecutive month of decline in the median FICO score for Ginnie Mae bank and nonbank originators. The median FICO for all Ginnie originations dropping to 678. The gap between banks and non-banks continues is most apparent in VA lending (34 point spread).

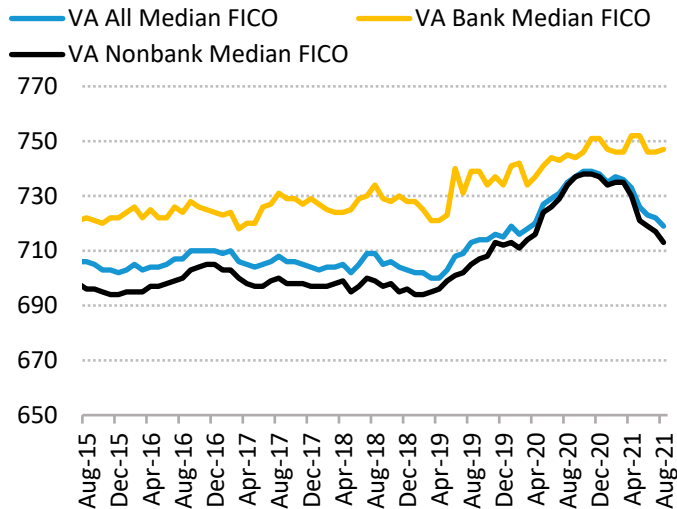
**Ginnie Mae FICO Score: Bank vs. Nonbank**



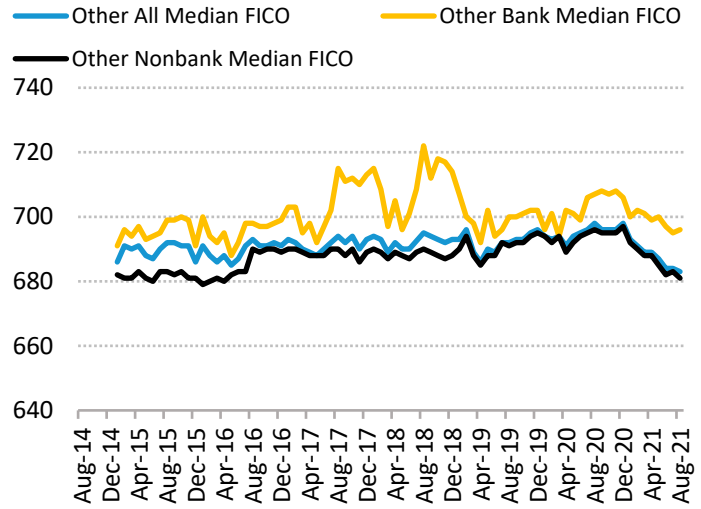
**Ginnie Mae FHA FICO Score: Bank vs. Nonbank**



**Ginnie Mae VA FICO Score: Bank vs. Nonbank**



**Ginnie Mae Other FICO Score: Bank vs. Nonbank**

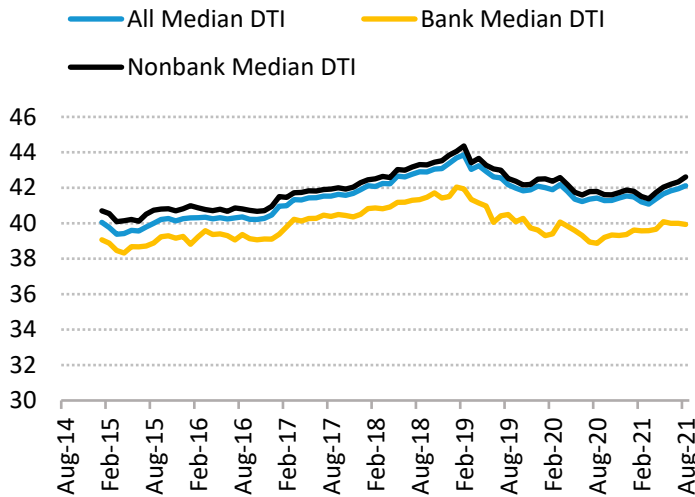


Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: "Other" refers to loans guaranteed by HUD's Office of Public and Indian Housing and the Department of Agriculture's Rural Development. Data as of August 2021.

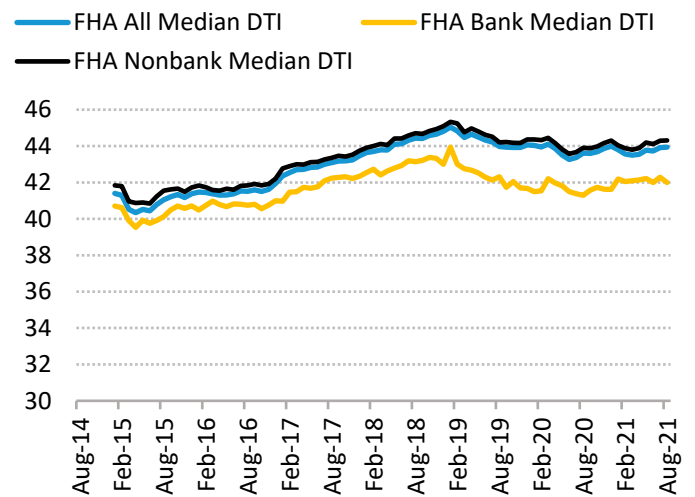
# Agency Nonbank Originators

Median DTI for Ginnie Mae nonbank originations has been consistently higher than median DTI for Ginnie Mae bank originations. This is a trend evident for all Ginnie Mae-eligible loan types except for the “Other” category, where the spread between median bank and nonbank DTI is relatively small.

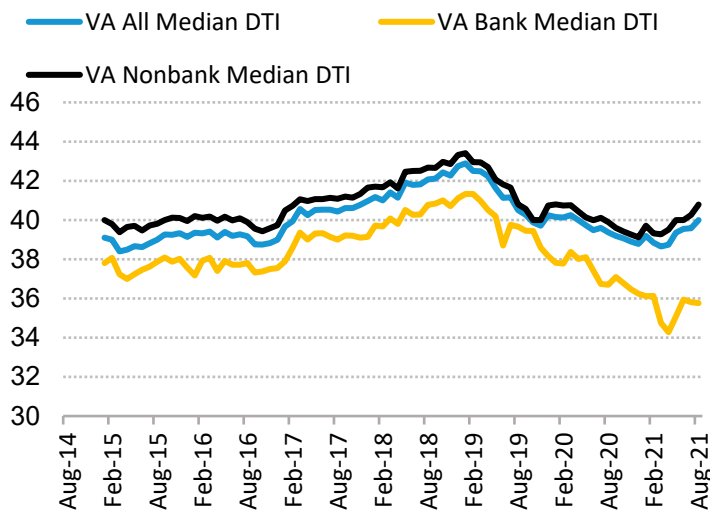
**Ginnie Mae DTI: Bank vs. Nonbank**



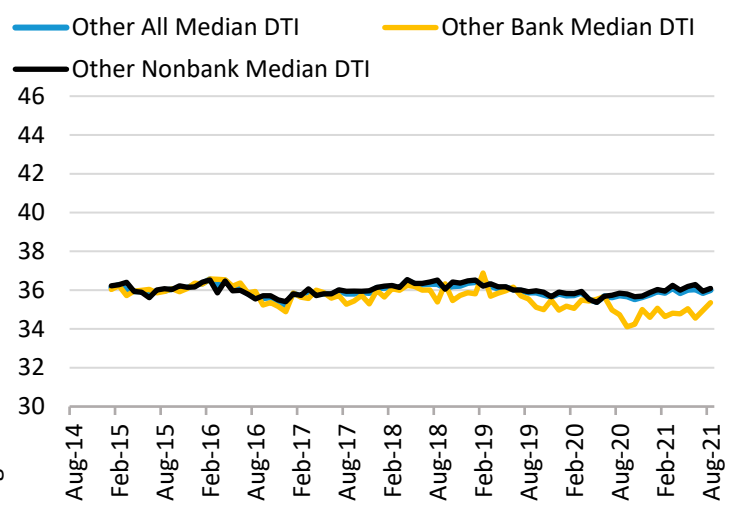
**Ginnie Mae FHA DTI: Bank vs. Nonbank**



**Ginnie Mae VA DTI: Bank vs. Nonbank**



**Ginnie Mae Other DTI: Bank vs. Nonbank**



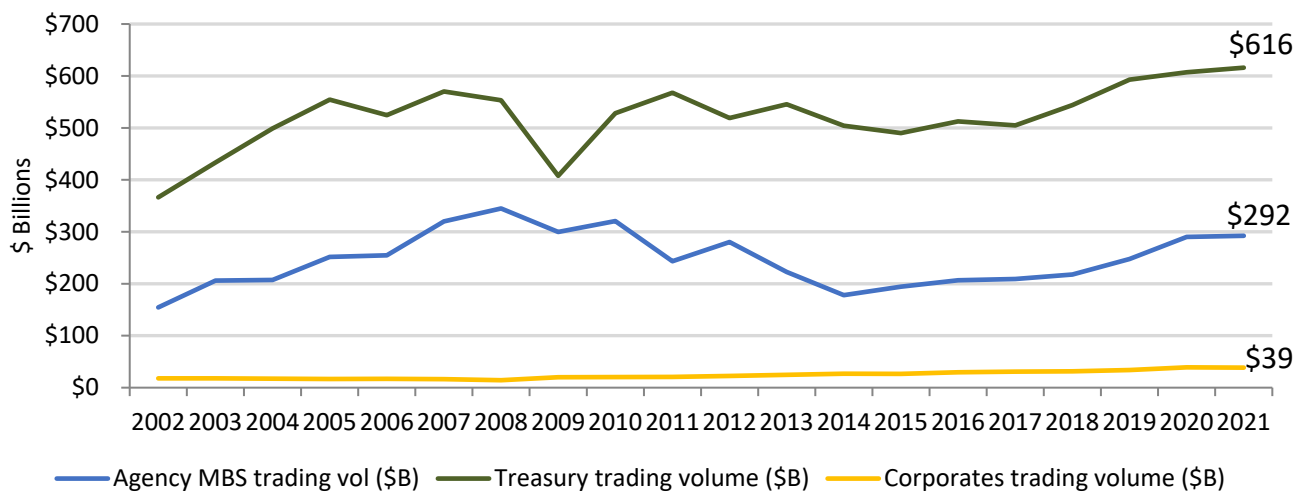
Sources: eMBS and Urban Institute; Beginning January 2021 data sourced from Ginnie Mae loan level disclosure files and IOPP. Notes: “Other” refers to loans insured by HUD’s Office of Public and Indian Housing and the Department of Agriculture’s Rural Development. Data as of August 2021.

## 7.0 Fixed Income Market Conditions

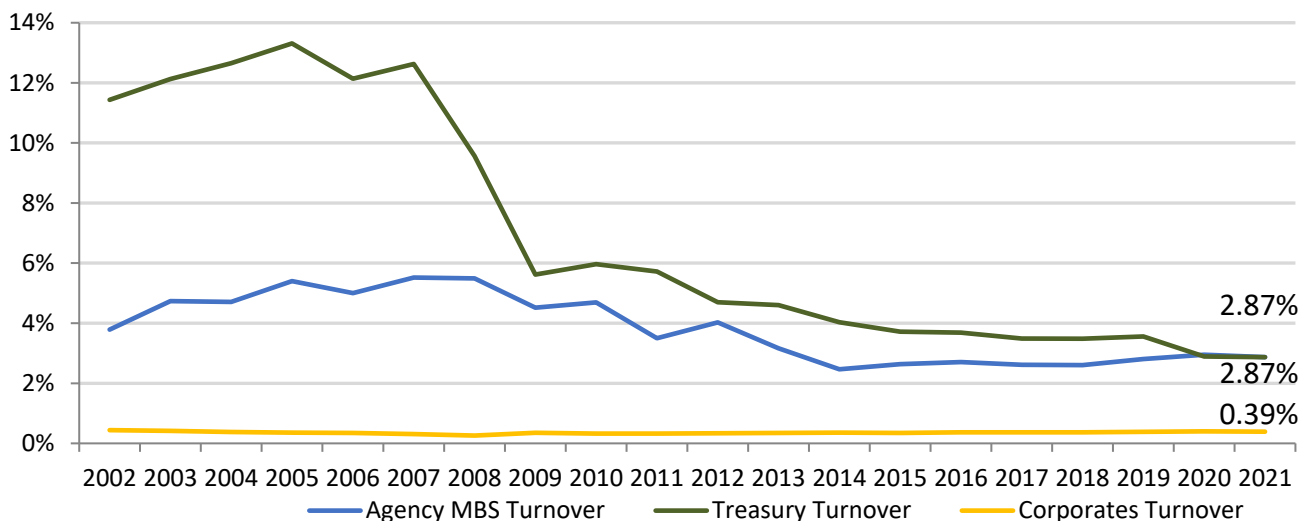
Agency MBS average daily trading volume was \$292 billion from January 2021 to August 2021. August 2021 was the lowest month of Agency MBS trading volume since June 2020. Agency MBS turnover in 2021 is 8 basis points lower than its 2020 average, at 2.87%. 2021 YTD Agency MBS turnover and US Treasury turnover are both 2.87%. Corporates turnover remains minimal relative to either Agency MBS or Treasury turnover.

### 7.1 Average Daily Trading Volume and Turnover by Sector

**Average Daily Trading Volume by Sector**



**Average Daily Turnover by Sector**



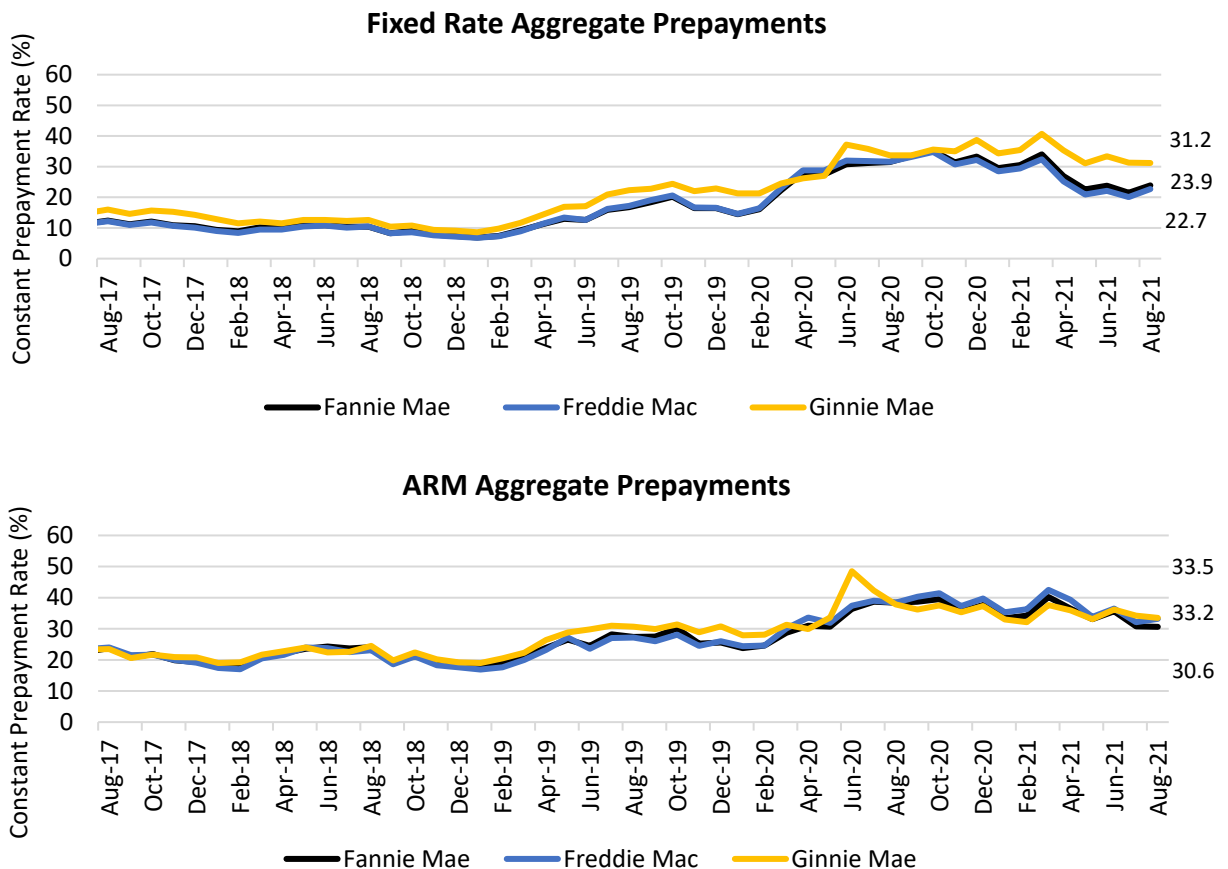
Source: SIFMA. Note: Data as of August 2021.

## 8.0 Prepayments

In August 2021, Ginnie Mae fixed rate prepayment speeds remained relatively static, at 31.2 CPR. Ginnie Mae 30-year buyout rates improved significantly month over month, dropping 32% and 13% in their Conditional Buyout Rate (CBR) for Ginnie Mae I and Ginnie Mae II, respectively. Voluntary prepayment increases offset buyout decreases by similar magnitude.<sup>5</sup> After a substantial decrease in July 2021, Fannie Mae and Freddie Mac fixed rate prepayment speeds went up by 11% and 13%, respectively. This is the first month that termination of the FHFA refinance fee come into effect for conventional buyers.

ARM MBS prepayments for both Fannie Mae and Ginnie Mae posted marginal changes, down by 1% and 2%, respectively, while the rate went up by 3% in the Freddie Mac space.

### 8.1 Aggregate Prepayments

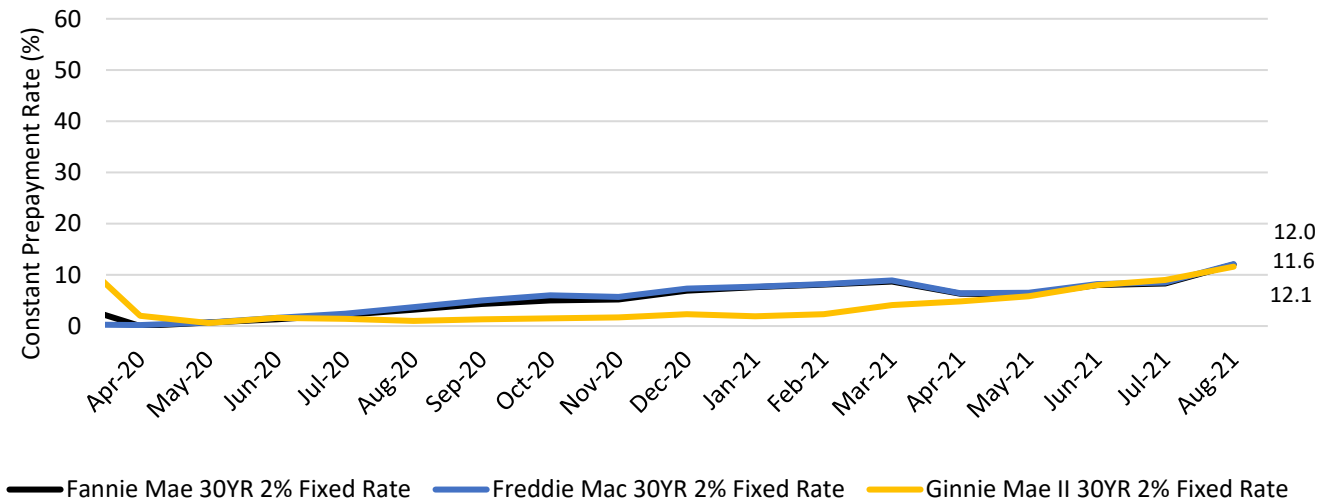


Source: eMBS; Note: Data as of August 2021.

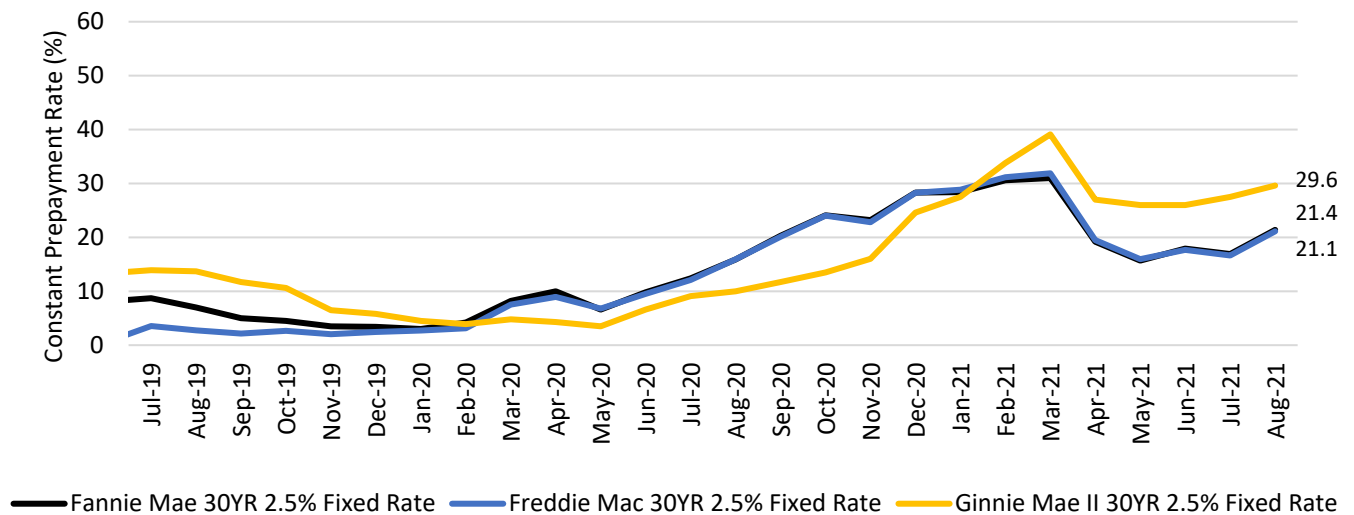
<sup>5</sup> Ahlgren R and Hong P (2021, September 8). US Structured Products Trading Desk Strategy | RMBS Strategy | Speeds Slower Than Forecast as Originators Shift Focus, pp. 1.

30-year fixed rate MBS with 2-2.5% coupons accounts for 42% of Agency remaining principal balance. Production of these Agency MBS ramped up in 2019. In August 2021, GSE prepayment speeds increased by 43% and 27% on average in the 2% and 2.5% coupon cohorts, respectively. Ginnie Mae prepayment speeds increase by a smaller amount, 29% and 8% in those coupon cohorts, respectively.

## All Agency 2% Coupon CPR



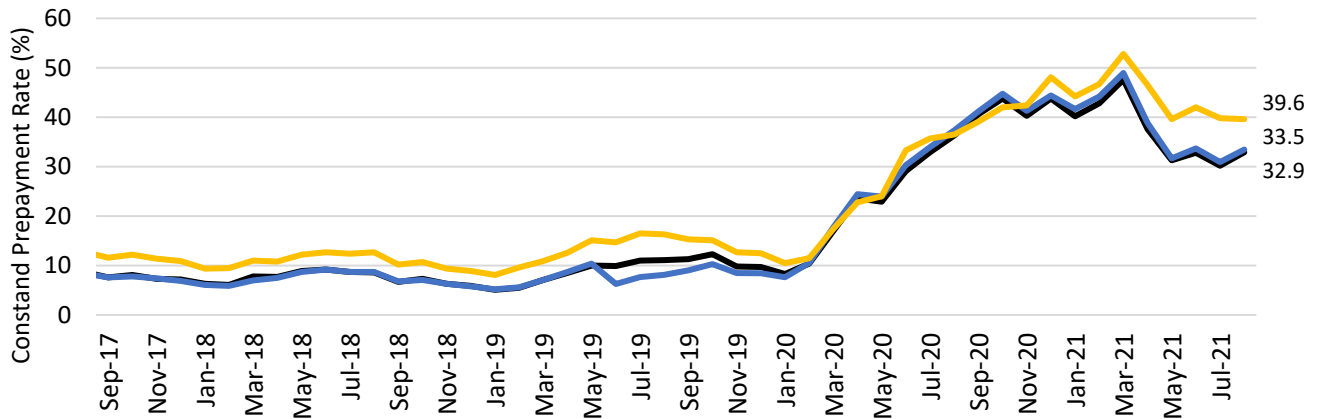
## All Agency 2.5% Coupon CPR



Source: eMBS. Note: Data as of August 2021. Freddie prepayment data is aggregated from 55-day UMBS and 45-day Gold PC, weighted average by August 2021 remaining principal balance.

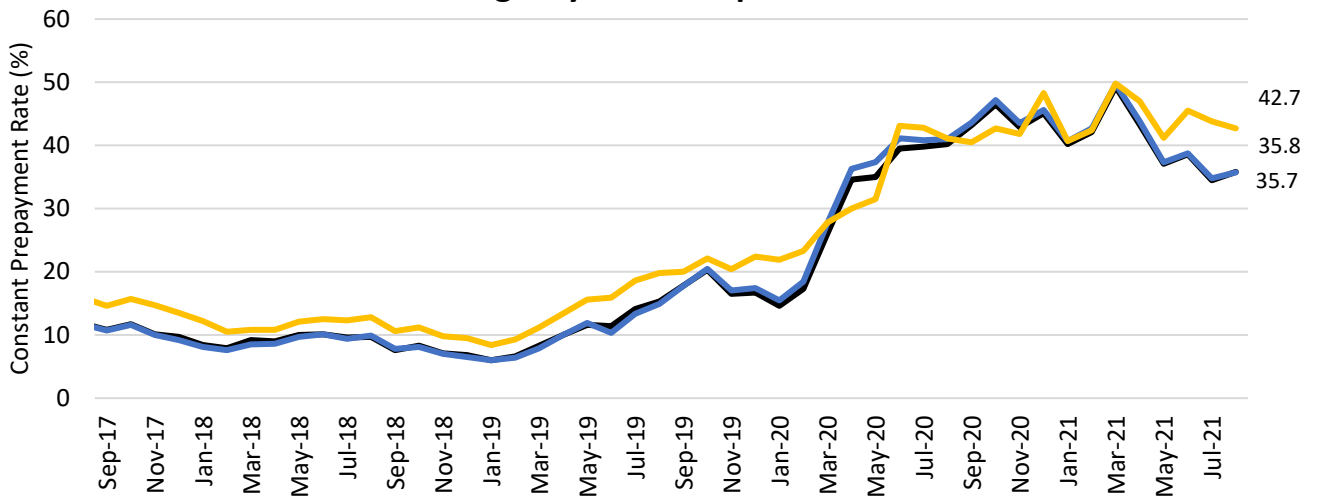
30-year fixed rate MBS with 3-4% coupons accounts for 31% of Agency remaining principal balance. Of the 3-4% coupon cohorts, Ginnie Mae prepayment speeds are substantially higher than the GSEs. Prepayment differential is the most evident in the 4% coupon cohorts where the difference widened by 7.6 CPR in August.

## All Agency 3% Coupon CPR



— Fannie Mae 30YR 3% Fixed Rate — Freddie Mac 30YR 3% Fixed Rate — Ginnie Mae II 30YR 3% Fixed Rate

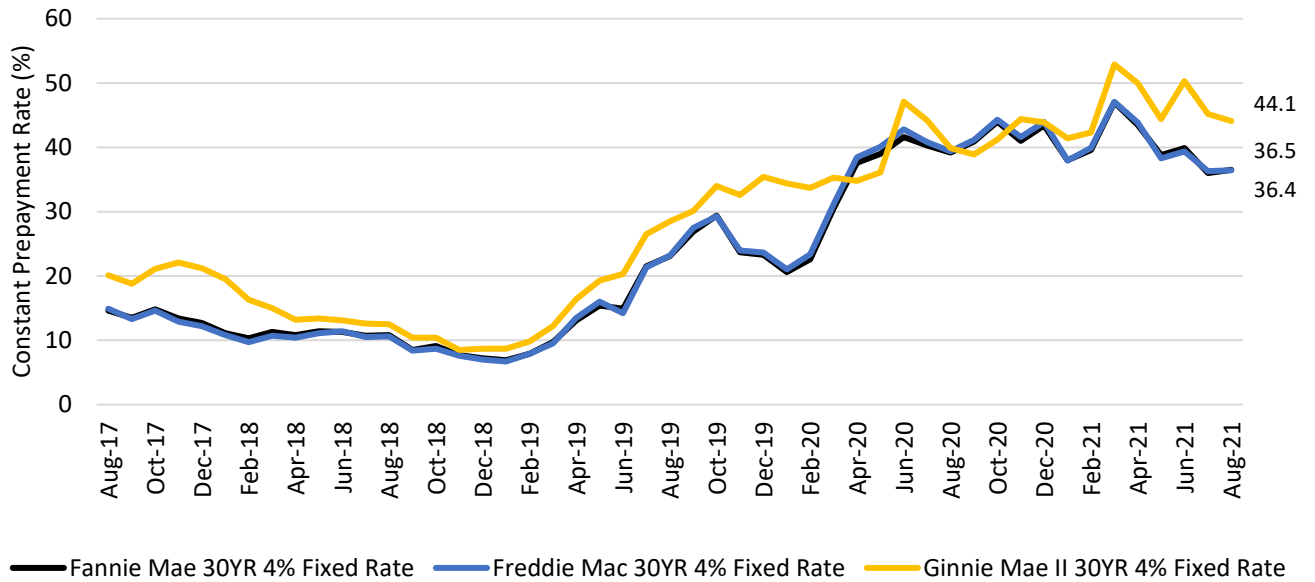
## All Agency 3.5% Coupon CPR



— Fannie Mae 30YR 3.5% Fixed Rate — Freddie Mac 30YR 3.5% Fixed Rate — Ginnie Mae II 30YR 3.5% Fixed Rate

Source: eMBS. Note: Data as of August 2021. Freddie prepayment data is aggregated from 55-day UMBS and 45-day Gold PC, weighted average by August 2021 remaining principal balance.

## All Agency 4% Coupon CPR



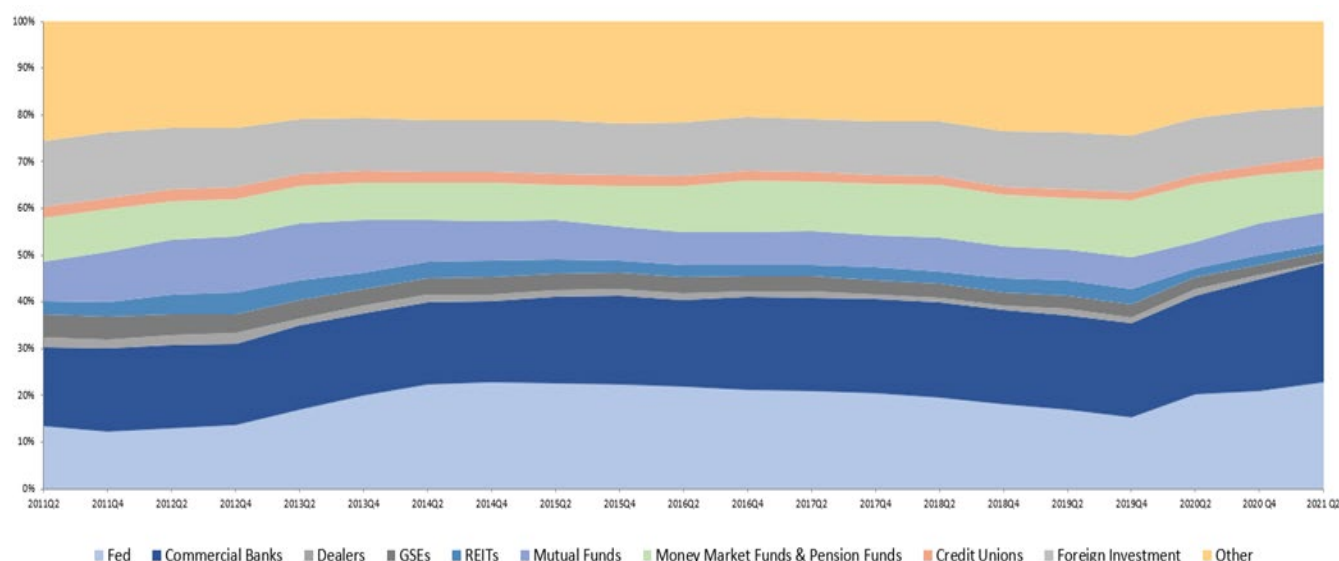
Source: eMBS. Note: Data as of August 2021. Freddie prepayment data is aggregated from 55-day UMBS and 45-day Gold PC, weighted average by August 2021 remaining principal balance.



## 9.0 MBS Ownership

As of Q2 2021, the largest holders of Agency debt (Agency MBS + Agency notes and bonds) included commercial banks (26%), the Federal Reserve (23%), and foreign investors (11%). The Federal Reserve's share increased to 23% in the second quarter of 2021, the highest it's been since 2015. Despite large Federal Reserve purchases, commercial banks continue to be the largest holders of Agency MBS. Out of their \$2.9 trillion in holdings as of the end of August 2021, \$2.1 trillion was held by the top 25 domestic banks.

### Who Owns Total Agency Debt?



Source: Federal Reserve Flow of Funds. Note: The "other" category includes primarily life insurance companies, state and local governments, households and nonprofits. Data as of Q2 2021.

### 9.1 Commercial Bank Holdings of Agency MBS

|                                   | Commercial Bank Holdings (\$Billions) |                |                |                |                |                |                |                | Week Ending    |                |                |                |
|-----------------------------------|---------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                   | Aug-20                                | Feb-21         | Mar-21         | Apr-21         | May-21         | Jun-21         | Jul-21         | Aug-21         | 1-Sep          | 8-Sep          | 15-Sep         | 22-Sep         |
| Largest 25 Domestic Banks         | 1,768.2                               | 1,988.7        | 2,017.5        | 2,040.5        | 2,071.2        | 2,082.3        | 2,102.6        | 2,120.7        | 2,125.8        | 2,110.5        | 2,122.2        | 2,128.8        |
| Small Domestic Banks              | 523.1                                 | 604.6          | 621.8          | 638.5          | 659.4          | 671.0          | 682.8          | 695.4          | 702.5          | 705.3          | 712.4          | 713.8          |
| Foreign Related Banks             | 42.7                                  | 51.4           | 51.6           | 50.8           | 48.8           | 46.9           | 47.3           | 48.4           | 51.3           | 50.8           | 47.2           | 46.9           |
| <b>Total, Seasonally Adjusted</b> | <b>2,334.0</b>                        | <b>2,644.7</b> | <b>2,690.9</b> | <b>2,729.8</b> | <b>2,779.4</b> | <b>2,800.2</b> | <b>2,832.7</b> | <b>2,864.5</b> | <b>2,879.6</b> | <b>2,866.6</b> | <b>2,881.8</b> | <b>2,889.5</b> |

Source: Federal Reserve Bank. Note: Small domestic banks include all domestically chartered commercial banks not included in the top 20. Data as of September 2021.

## 9.2 Bank and Thrift Residential MBS Holdings

In Q2 2021, MBS holdings at banks and thrifts increased for the eleventh consecutive quarter. The increase was driven by both GSE pass-throughs and Private CMO holdings, with the increase in GSE pass-throughs making the larger contribution. Total bank and thrift MBS holdings increased by 3% from Q1 2021. Out of the \$2.8 trillion in MBS holdings at banks and thrifts as of Q2 2021, \$2.2 trillion were Agency pass-throughs. \$1.8 trillion were GSE pass-throughs and \$353 billion were Ginnie Mae pass-throughs. Another \$555 billion were Agency CMOs, while non-Agency holdings totaled \$48 billion.

### Bank and Thrift Residential MBS Holdings

| Year             | All Banks & Thrifts<br>(\$ in billions) |            |             |             |            |             | All MBS<br>(\$ in billions) |            |
|------------------|---|------------|-------------|-------------|------------|-------------|-----------------------------|------------|
|                  | Total                                   | GSE PT     | GNMA PT     | Private MBS | Agency CMO | Private CMO | Banks                       | Thrifts    |
| 2000             | 683.90                                  | 234.01     | 84.26       | 21.57       | 198.04     | 71.43       | 470.47                      | 212.65     |
| 2001             | 810.50                                  | 270.59     | 109.53      | 37.62       | 236.91     | 76.18       | 606.91                      | 203.37     |
| 2002             | 912.36                                  | 376.11     | 101.46      | 20.08       | 244.98     | 89.88       | 702.44                      | 209.66     |
| 2003             | 982.08                                  | 461.72     | 75.11       | 19.40       | 236.81     | 106.86      | 775.66                      | 206.45     |
| 2004             | 1,113.89                                | 572.40     | 49.33       | 20.55       | 208.18     | 160.55      | 879.75                      | 234.31     |
| 2005             | 1,033.77                                | 566.81     | 35.92       | 29.09       | 190.70     | 211.25      | 897.06                      | 242.69     |
| 2006             | 1,124.46                                | 628.52     | 31.13       | 42.32       | 179.21     | 243.28      | 983.49                      | 223.42     |
| 2007             | 1,149.10                                | 559.75     | 31.58       | 26.26       | 174.27     | 357.24      | 971.42                      | 264.59     |
| 2008             | 1,218.77                                | 638.78     | 100.36      | 12.93       | 207.66     | 259.04      | 1,088.00                    | 211.73     |
| 2009             | 1,275.52                                | 629.19     | 155.00      | 7.53        | 271.17     | 212.64      | 1,161.67                    | 184.07     |
| 2010             | 1,433.38                                | 600.80     | 163.13      | 7.34        | 397.30     | 181.61      | 1,233.28                    | 200.09     |
| 2011             | 1,566.88                                | 627.37     | 214.81      | 3.28        | 478.82     | 167.70      | 1,359.24                    | 207.64     |
| 2012             | 1,578.86                                | 707.87     | 242.54      | 17.16       | 469.27     | 138.67      | 1,430.63                    | 148.22     |
| 2013             | 1,506.60                                | 705.97     | 231.93      | 26.11       | 432.60     | 114.15      | 1,363.65                    | 142.94     |
| 2014             | 1,539.32                                | 733.71     | 230.45      | 20.33       | 449.90     | 104.94      | 1,409.84                    | 129.48     |
| 2015             | 1,643.56                                | 823.10     | 292.30      | 11.14       | 445.39     | 71.63       | 1,512.67                    | 130.89     |
| 2016             | 1,736.93                                | 930.67     | 323.46      | 7.40        | 419.80     | 55.60       | 1,576.07                    | 160.86     |
| 2017             | 1,844.15                                | 1,010.83   | 367.70      | 4.63        | 413.97     | 47.01       | 1,672.93                    | 171.22     |
| 1Q18             | 1,809.98                                | 991.57     | 360.71      | 3.92        | 412.41     | 41.37       | 1,635.52                    | 174.46     |
| 2Q18             | 1,806.58                                | 976.92     | 368.88      | 7.45        | 414.41     | 38.92       | 1,631.65                    | 174.93     |
| 3Q18             | 1,794.39                                | 966.52     | 373.21      | 2.42        | 416.20     | 36.04       | 1,618.29                    | 176.10     |
| 4Q18             | 1,814.97                                | 980.56     | 380.43      | 2.69        | 416.59     | 34.69       | 1,634.99                    | 179.98     |
| 1Q19             | 1,844.99                                | 1,001.61   | 383.49      | 3.06        | 422.18     | 34.65       | 1,673.40                    | 171.59     |
| 2Q19             | 1,907.13                                | 1,037.93   | 407.97      | 2.90        | 421.56     | 36.76       | 1,727.65                    | 179.47     |
| 3Q19             | 1,975.78                                | 1,079.82   | 427.10      | 4.74        | 428.69     | 35.44       | 1,786.74                    | 189.04     |
| 4Q19             | 1,985.38                                | 1,089.41   | 426.85      | 4.62        | 428.99     | 35.52       | 1,796.29                    | 189.09     |
| 1Q20             | 2,107.66                                | 1,173.36   | 448.34      | 4.65        | 443.73     | 37.57       | 1,907.02                    | 200.64     |
| 2Q20             | 2,195.19                                | 1,228.87   | 441.06      | 5.00        | 478.11     | 42.14       | 1,946.36                    | 248.83     |
| 3Q20             | 2,310.42                                | 1,349.48   | 415.24      | 4.43        | 499.50     | 41.78       | 2,040.61                    | 269.81     |
| 4Q20             | 2,520.90                                | 1,537.54   | 390.66      | 3.94        | 548.65     | 40.10       | 2,210.22                    | 310.68     |
| 1Q21             | 2,690.92                                | 1,713.78   | 374.63      | 4.88        | 555.35     | 42.28       | 2,350.94                    | 339.98     |
| 2Q21             | 2,781.91                                | 1,825.80   | 352.77      | 4.77        | 555.45     | 43.12       | 2,431.76                    | 350.15     |
| <b>Change:</b>   |   |            |             |             |            |             |                             |            |
| <b>1Q21-2Q21</b> | <b>3%</b>                               | <b>7%</b>  | <b>-6%</b>  | <b>-2%</b>  | <b>0%</b>  | <b>2%</b>   | <b>3%</b>                   | <b>3%</b>  |
| <b>2Q20-2Q21</b> | <b>27%</b>                              | <b>49%</b> | <b>-20%</b> | <b>-5%</b>  | <b>16%</b> | <b>2%</b>   | <b>25%</b>                  | <b>41%</b> |

Source: Inside Mortgage Finance. Notes: Data as of Q2 2021.

## Bank and Thrift Residential MBS Holdings

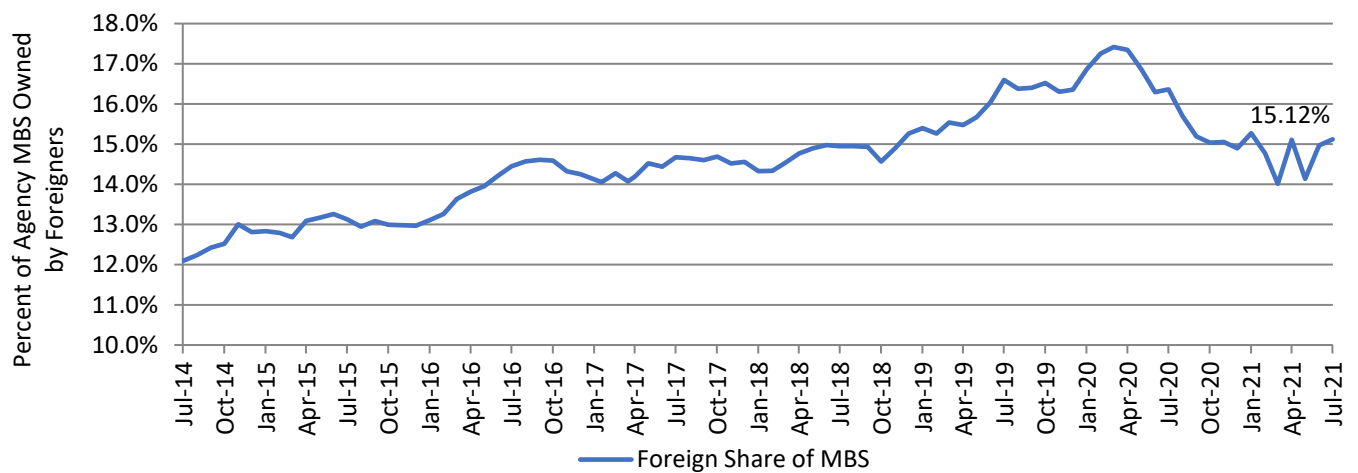
| Top Bank & Thrift Residential MBS Investors (\$ in millions) |                                      |                     |                    |                  |                  |                 |            |
|--|--------------------------------------|---------------------|--------------------|------------------|------------------|-----------------|------------|
|  | Institution                          | Total               | GSE PT             | GNMA PT          | Agency CMO       | Non-Agency      | Share      |
| 1  | Bank of America Corporation          | 611,942.0           | 510,382.0          | 89,844.0         | 11,484.0         | 232.0           | 22%        |
| 2  | Wells Fargo & Company                | 277,627.0           | 206,837.0          | 65,204.0         | 5,170.0          | 416.0           | 10%        |
| 3  | Charles Schwab Bank                  | 180,800.0           | 91,697.0           | 10,560.0         | 78,543.0         | -               | 7%         |
| 4  | JPMorgan Chase & Co.                 | 170,868.0           | 97,339.0           | 59,649.0         | 135.0            | 13,745.0        | 6%         |
| 5  | Truist Bank                          | 124,588.0           | 53,308.0           | 11,609.0         | 59,164.0         | 507.0           | 5%         |
| 6  | U.S. Bancorp                         | 120,203.0           | 84,365.2           | 21,545.5         | 14,291.9         | 0.4             | 4%         |
| 7  | Citigroup Inc.                       | 96,396.0            | 89,447.0           | 1,784.0          | 4,004.0          | 1,161.0         | 4%         |
| 8  | Capital One Financial Corporation    | 77,750.4            | 45,284.1           | 9,903.8          | 22,018.6         | 543.9           | 3%         |
| 9  | PNC Bank, National Corporation       | 57,478.7            | 48,260.8           | 6,794.5          | 1,100.7          | 1,322.7         | 2%         |
| 10   | Bank of New York Mellon Corp         | 56,473.0            | 42,325.0           | 2,415.0          | 9,203.0          | 2,530.0         | 2%         |
| 11   | Silicon Valley Bank                  | 54,124.3            | 45,380.0           | 2,797.2          | 5,947.1          | -               | 2%         |
| 12   | USAA Federal Savings Bank            | 45,810.4            | 39,747.6           | 1,985.5          | 4,077.4          | -               | 2%         |
| 13   | State Street Bank and Trust Company  | 41,711.7            | 17,771.0           | 4,976.0          | 16,559.7         | 2,405.0         | 2%         |
| 14   | E*Trade Bank                         | 34,917.2            | 27,426.9           | 5,270.2          | 2,220.1          | -               | 1%         |
| 15   | Morgan Stanley                       | 32,548.0            | 21,163.0           | 3,910.0          | 7,475.0          | -               | 1%         |
| 16   | The Huntington National Bank         | 24,589.1            | 16,904.6           | 2,600.0          | 4,942.2          | 142.2           | 1%         |
| 17   | Ally Bank                            | 24,144.0            | 18,093.0           | 868.0            | 2,297.0          | 2,886.0         | 1%         |
| 18   | HSBC Bank USA, National Association  | 23,563.2            | 7,776.0            | 7,591.4          | 8,194.3          | 1.6             | 1%         |
| 19   | TD Bank USA/TD Bank NA               | 23,494.6            | 1,379.5            | 122.8            | 21,895.8         | 96.4            | 1%         |
| 20   | BMO Harris Bank National Association | 23,258.0            | 4,410.4            | 391.7            | 18,450.3         | 5.6             | 1%         |
| <b>Total Top 20</b>  |                                      | <b>2,102,286.60</b> | <b>1,469,297.1</b> | <b>309,821.6</b> | <b>297,173.1</b> | <b>25,994.8</b> | <b>76%</b> |

Source: Inside Mortgage Finance. Notes: Data as of Q2 2021.

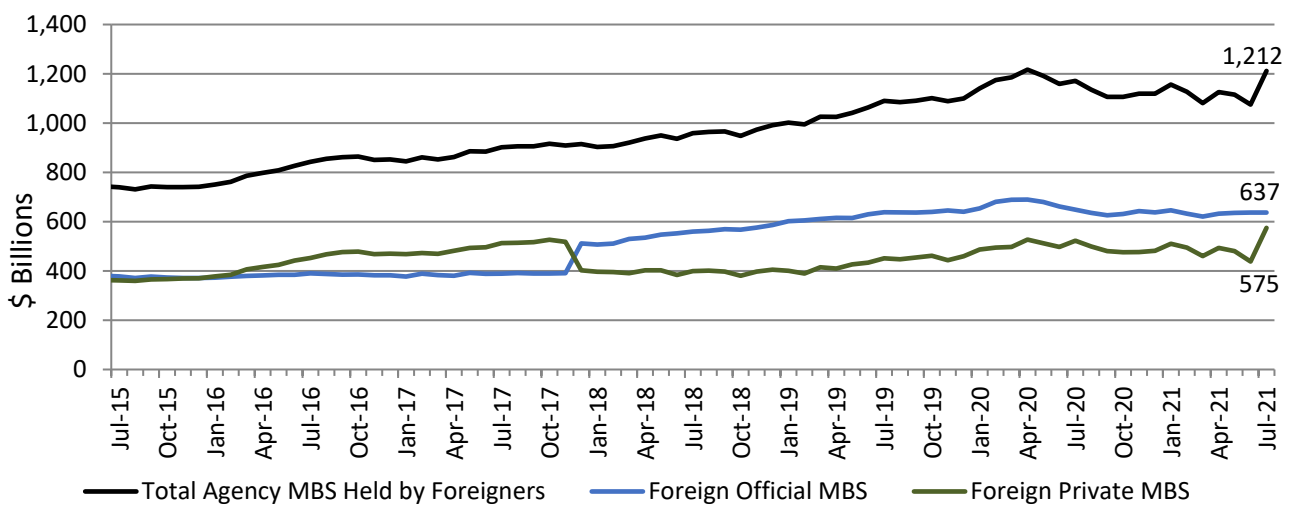
## 9.3 Foreign Ownership of MBS

For the month of July 2021, foreign ownership of MBS represents \$1.21 trillion in Agency MBS, which includes \$575 billion held by foreign private institutions and \$637 billion held by foreign official institutions. This is the highest volume of foreign holdings of Agency MBS since April 2020 and the highest share since January 2021.

**Foreign Share of Agency MBS Market**



**Monthly Foreign MBS Holdings**



Sources: Treasury International Capital (TIC). Notes: In December 2017, there was a data correction that moved about \$120 billion from privately held U.S. Agency bonds to officially held U.S. Agency bonds; this resulted in a series break at December 2017 in the split between the portion held by foreign private and the portion held by foreign official. Data as of July 2021.

## 9.4 Foreign Ownership of Agency Debt and Agency MBS

The largest non-US holders of Agency MBS are in Japan, Taiwan, and China. These three own 70% of all US MBS held by investors outside of the United States. Between June 2020 and June 2021, these top three have decreased their Agency MBS holdings by over \$4.6 billion. Japan has decreased their holdings by \$1.4 billion, Taiwan has decreased their holdings by \$208 million and China has decreased their holdings by \$3.0 billion.

### All Agency Debt

| Country        | Level of Holdings (\$ Millions) |                  |                  |                  | Change in Holdings (\$ Millions) |                |                |
|----------------|---------------------------------|------------------|------------------|------------------|----------------------------------|----------------|----------------|
|                | 9/1/2020                        | 12/1/2020        | 3/1/2021         | 6/1/2021         | Q4 2020                          | Q1 2021        | Q2 2021        |
| Japan          | 305,064                         | 308,033          | 319,771          | 311,375          | 2,969                            | 11,738         | -8,396         |
| Taiwan         | 264,270                         | 262,453          | 253,036          | 250,081          | -1,817                           | -9,417         | -2,955         |
| China          | 206,861                         | 212,317          | 200,972          | 217,842          | 5,456                            | -11,345        | 16,870         |
| Luxembourg     | 35,626                          | 36,223           | 34,371           | 35,497           | 597                              | -1,852         | 1,126          |
| Ireland        | 28,286                          | 31,064           | 26,965           | 21,453           | 2,778                            | -4,099         | -5,512         |
| South Korea    | 40,303                          | 42,628           | 43,032           | 43,201           | 2,325                            | 404            | 169            |
| Cayman Islands | 34,495                          | 34,264           | 37,111           | 36,027           | -231                             | 2,847          | -1,084         |
| Bermuda        | 35,751                          | 27,988           | 26,443           | 23,806           | -7,763                           | -1,545         | -2,637         |
| Netherlands    | 10,964                          | 12,344           | 13,049           | 12,544           | 1,380                            | 705            | -505           |
| Malaysia       | 19,808                          | 19,147           | 19,047           | 19,089           | -661                             | -100           | 42             |
| Other          | 190,175                         | 197,462          | 173,905          | 166,009          | 7,287                            | -23,557        | -7,896         |
| <b>Total</b>   | <b>1,171,603</b>                | <b>1,183,923</b> | <b>1,147,702</b> | <b>1,136,924</b> | <b>12,320</b>                    | <b>-36,221</b> | <b>-10,778</b> |

### Agency MBS

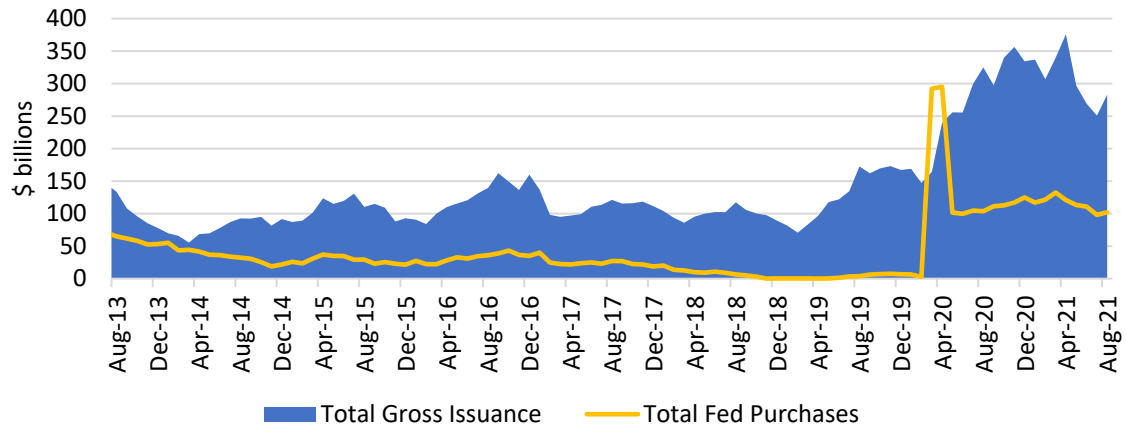
| Country        | Level of Holdings (\$ Millions) |                  |                                      |
|----------------|---------------------------------|------------------|--------------------------------------|
|                | 6/1/2020                        | 6/1/2021         | YoY Change in Holdings (\$ Millions) |
| Japan          | 306,963                         | 305,580          | -1,383                               |
| Taiwan         | 267,700                         | 267,492          | -208                                 |
| China          | 235,078                         | 232,076          | -3,002                               |
| Luxembourg     | 40,207                          | 34,255           | -5,952                               |
| Ireland        | 21,091                          | 25,336           | 4,245                                |
| South Korea    | 28,743                          | 34,313           | 5,570                                |
| Cayman Islands | 28,431                          | 29,682           | 1,251                                |
| Bermuda        | 25,111                          | 24,245           | -866                                 |
| Netherlands    | 12,739                          | 13,351           | 612                                  |
| Malaysia       | 20,028                          | 19,949           | -79                                  |
| Other          | 173,716                         | 170,062          | -3,654                               |
| <b>Total</b>   | <b>1,159,809</b>                | <b>1,156,341</b> | <b>-3,468</b>                        |

Sources: Treasury International Capital (TIC). Notes: Level of Agency debt Holdings by month data as of Q2 2021. Agency MBS as of June 2021. Revised to include top 10 holders of Agency debt listed as of June 2018.

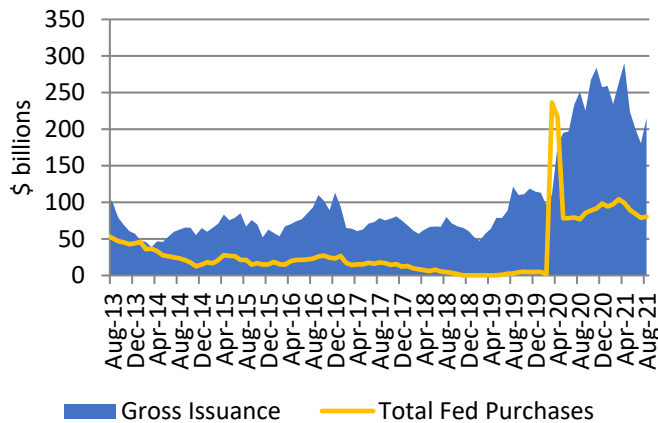
## 9.5 Federal Reserve Absorption of Agency MBS

The Fed purchased \$102.1 billion in August 2021 (36.1% of monthly gross issuance) which was a slight increase from the \$98.16 billion purchased in July 2021 (39.1% of monthly gross issuance). Fed purchases of Ginnie Mae MBS increased MoM, with \$21.7 billion (32.1% of gross Ginnie Mae Issuance) compared to \$19.5 billion in Fed purchases (27.8% of gross Ginnie Mae issuance) in July 2021. In their most recent press release on September 22, 2021, the FOMC indicated that moderation in the pace of asset purchases may soon be warranted (see Global Market Analysis Report *Highlights*).

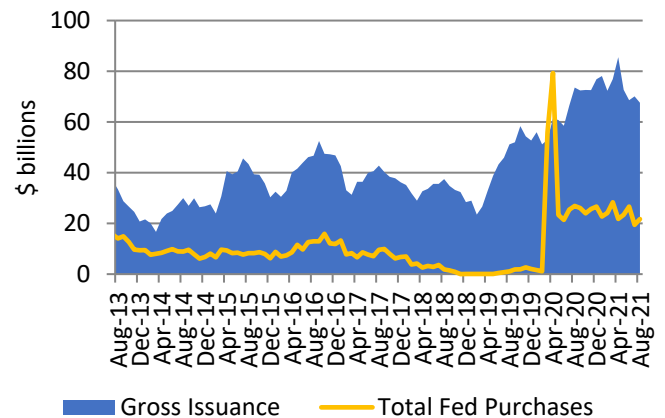
**Total Fed Absorption**



**Fed Absorption of GSE MBS**



**Fed Absorption of Ginnie Mae MBS**



Sources: eMBS, Federal Reserve Bank of New York and <https://fred.stlouisfed.org/series/WSHOMCB>. Notes: Data as of August 2021.

Disclosure:

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