COVID-19 Impacts and Key Drivers to Agency First Lien FRM Mortgage Performance

Jui-Chuan Wu (Amy), Director
David Fieldhouse, Director

October 29, 2020
Agenda

2. Which Accounts Are More Sensitive to the Economy
3. Methods to Analyze Fannie Mae and Freddie Mac Loans Under the CARES Act
How COVID-19 Will Impact Fannie Mae and Freddie Mac First Lien FRM Mortgages
Pre and Post COVID-19 Baseline Macro Outlook Changes

U.S. real GDP growth, SAAR (%)

Sources: BEA, Moody’s Analytics
Pre and Post COVID-19 Baseline Macro Outlook Changes

U.S. unemployment rate (%)

Sources: BLS, Moody's Analytics
Pre and Post COVID-19 Baseline Macro Outlook Changes

U.S. home price growth, SAAR (%)

Sources: NAR, Moody’s Analytics
Pre and Post COVID-19 Baseline Macro Outlook Changes

U.S. 15-Year Fixed Rate Mortgage Commitment Rate, SAAR (%)

Sources: Freddie Mac, Moody’s Analytics
Pre and Post COVID-19 Baseline Macro Outlook Changes

U.S. 30-Year Fixed Rate Mortgage Commitment Rate, SAAR (%)

Sources: Freddie Mac, Moody's Analytics
Fannie Mae and Freddie Mac Loans In Forbearance

% of loans in payment deferral = 0.38% out of total loans serviced in July-20

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Fannie Mae and Freddie Mac Loans In Delinquent

% of loans in 90DPD+ are increasing while loans in 30DPD and 60DPD are decreasing

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Fannie Mae Loans in Delinquent

Total: 40bps, 30DPD: 12bps, 60DPD: 8bps, 90DPD+: 11bps more on average compare to Freddie Mac since April 2020

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Freddie Mac Loans in Delinquent

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Mortgage Portfolio Analyzer - How It Works

MPA models default, prepayment, and severity for each loan, taking as input information on the borrower, loan, underlying property, and local & national macro-economic factors.

Source: Moody’s Analytics
Lifetime CPR Change Since COVID-19

0.5 million 12/2019 Fannie Mae vs. 6/2019 Freddie Mac randomly sample portfolio March Run Results

Fannie Mae

- February: 5.7743%
- March: 8.3357%
- June: 8.9303%
- September: 8.9798%

Fannie Mae Lifetime CPR Change:
- February to March: 2.5614%
- February to June: 3.1554%
- February to September: 3.2055%

Freddie Mac

- February: 5.5682%
- March: 8.2917%
- June: 8.9590%
- September: 8.9626%

Freddie Mac Lifetime CPR Change:
- February to March: 2.7235%
- February to June: 3.3908%
- February to September: 3.4044%

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Lifetime CDR Change Since COVID-19

0.5 million 12/2019 Fannie Mae vs. 6/2019 Freddie Mac randomly sample portfolio March run results

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Weighted Average Life Change Since COVID-19

0.5 million 12/2019 Fannie Mae vs. 6/2019 Freddie Mac randomly sample portfolio March run results

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Most State Lifetime CPR Change Are Similar Between Feb and Sept Baseline

The Biggest Differences = 7.27% for Fannie and 7.16% for Freddie Excluding VI and PR among states

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
MSA Lifetime CPR Change Can Be Very Different Even In The Same State

The Biggest Differences = 22.90% for Fannie and 17.81% for Freddie among MSA

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Lifetime CDR Change Is Quite Different Among States Between Feb and Sept Baseline

The Biggest Differences = 107.73% for Fannie and 86.69% for Freddie Excluding VI and PR among states

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
MSA Lifetime CDR Change Can Dramatically Different Even in the Same State

The Biggest Differences = 120.03% for Fannie and 103.56% for Freddie among MSA

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Which Accounts Are More Sensitive to the Economy
2.1 Prepayment
Fannie Mae – 10 Year Loans’ Burnout Effect Happens Much Later and 30 Year Loans Are Most Subject to Burnout Effect

Rate Spread = Loan Rate - (Freddie15[0] if loan term<=180 and Freddie30[0] if loan term>180)

Monthly Prepayment (%)

20 year loans are most sensitive when the loans start to be in the money

When the loans are deep in the money, the burnout effect starts to kick in, but at a different speed.

Sources: Fannie Mae, Moody’s Analytics
Freddie Mac - Loans Are More Sensitive to Rate Spread Change Compare to Fannie Mae Loans Between 0 to 1.4%

15 year loans have higher burnout effect compare to 30 year loans

Out of money increase due to non-interest rate prepayment factors.

Sources: Freddie Mac, Moody's Analytics
Fannie Mae Loans Are More Sensitive to the Home Price Change Compare to Freddie Mac Loans and When UpdatedCLTV Is Between 100% - 180%

Sources: Fannie Mae, Freddie Mac, Moody’s Analytics
Prepayment Behavior Is Different Before and After 2008 Crisis

Freddie Mac loans are more sensitive to FICO differences post 200806

Sources: Fannie Mae, Freddie Mac, Moody’s Analytics
Smaller Size Loans Have Lower Prepayment Probability Due to Refinancing Cost

Sources: Fannie Mae, Freddie Mac, Moody's Analytics
Freddie Mac’s Refinance Rate Is Around 1.4 Times Higher in July

Fannie Mae and Freddie Mac Loans Total Refinance Rate

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
2.2 | Default
Fannie Mae – High FICO Loans Are Most Sensitive to Macro Shock

Average CDR - weighted by the portfolio balance at the end of the previous month

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Freddie Mac – High FICO Loans Are Most Sensitive to Macro Shock

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Delinquency Rates Are More Than Three Times Higher For Low FICO Loans

Total Delinquent Loans Percentage By Original Credit Score

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Delinquency Rate Increased The Most For FICO >= 660 Loans

Change of the delinquency rate since Jan-2020. Freddie Mac loans have higher changes.

Sources: FHFA Foreclosure Prevention and Refinance Report, Moody’s Analytics
Fannie Mae – Young Loans Are Most Sensitive to Macro Shocks

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
Freddie Mac – Young Loans Are Most Sensitive to Macro Shocks

A bit less sensitive compare to Fannie Mae loans

Sources: Moody’s Analytics, Mortgage Portfolio Analyzer
3

Methods to Analyze Fannie Mae and Freddie Mac Loans Under the CARES Act
## Fannie Mae - Can We Learn From the History?

Major U.S. natural disaster events in the past 15 years that affected mortgage default rate

<table>
<thead>
<tr>
<th>Incident</th>
<th>Incident Period</th>
<th>Affected State</th>
<th>Default Periods</th>
<th>Cure Rate</th>
<th>Avg. Months To Cured</th>
<th>Avg. LGD For Non-Cured Loans</th>
<th>Avg. Time2Liq For Non-Cured Loans (Months)</th>
<th>% of Modified Loans</th>
<th>Avg. Months To Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maria</td>
<td>201709</td>
<td>PR</td>
<td>201709~201806</td>
<td>79.77%</td>
<td>9</td>
<td>52.79%</td>
<td>42</td>
<td>62.06%</td>
<td>6</td>
</tr>
<tr>
<td>Harvey</td>
<td>201708~201709</td>
<td>TX</td>
<td>201710~201801</td>
<td>69.69%</td>
<td>9</td>
<td>23.9%</td>
<td>45</td>
<td>58.31%</td>
<td>6</td>
</tr>
<tr>
<td>Irma</td>
<td>201709</td>
<td>FL</td>
<td>201711~201802</td>
<td>71.06%</td>
<td>9</td>
<td>41.13%</td>
<td>71</td>
<td>69.41%</td>
<td>5</td>
</tr>
<tr>
<td>Katrina</td>
<td>200508~200511</td>
<td>LA, MS, AL</td>
<td>LA: 200509~200604</td>
<td>21.22%</td>
<td>3</td>
<td>52.49%</td>
<td>54</td>
<td>17.48%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>MS: 200510~200602</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AL: 200511~200601</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Loans</td>
<td>N/A</td>
<td>N/A</td>
<td>200001~201912</td>
<td>51.26%</td>
<td>15</td>
<td>55.36%</td>
<td>17</td>
<td>34.63%</td>
<td>17</td>
</tr>
</tbody>
</table>

Sources: Fannie Mae, Moody’s Analytics

*Cured Definition: Loan status became Current for at least three consecutive months after default (90DPD+).
## Freddie Mac – % Of Modified Loans Post Disaster Event Are Less

Major U.S. natural disaster events in the past 15 years that affected mortgage default rate

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<th>% of Modified Loans</th>
<th>Avg. Months To Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maria</td>
<td>201709</td>
<td>PR</td>
<td>201710~201805</td>
<td>70.29%</td>
<td>9</td>
<td>67.48%</td>
<td>61</td>
<td>47.97%</td>
<td>6</td>
</tr>
<tr>
<td>Harvey</td>
<td>201708~201709</td>
<td>TX</td>
<td>201710~201801</td>
<td>65.79%</td>
<td>8</td>
<td>23.04%</td>
<td>46</td>
<td>44.68%</td>
<td>6</td>
</tr>
<tr>
<td>Irma</td>
<td>201709</td>
<td>FL</td>
<td>201711~201802</td>
<td>72.40%</td>
<td>8</td>
<td>43.59%</td>
<td>57</td>
<td>54.97%</td>
<td>6</td>
</tr>
<tr>
<td>Katrina</td>
<td>200508~200511</td>
<td>LA, MS, AL</td>
<td>LA: 200509<del>200603 MS: 200510</del>200602 AL: 200510~200601</td>
<td>11.83%</td>
<td>3</td>
<td>43.41%</td>
<td>69</td>
<td>14.43%</td>
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<tr>
<td>All Loans</td>
<td>N/A</td>
<td>N/A</td>
<td>199902~201906</td>
<td>61.35%</td>
<td>16</td>
<td>49.19%</td>
<td>17</td>
<td>28.93%</td>
<td>18</td>
</tr>
</tbody>
</table>

Sources: Freddie Mac, Moody’s Analytics

*Cured Definition: Loan status became Current for at least three consecutive months after default (90DPD+).
Questions & Answers

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