LIBOR 101:
Transition Basics for the Single Family Market
April 16, 2020

Moderator:
Dan Fichtler, Associate Vice President, MBA

Presenter:
Paul Noring, Managing Director, Berkeley Research Group, LLC

Moderator

Dan Fichtler is Associate Vice President of Housing Finance Policy at the Mortgage Bankers Association. In this role, he is responsible for developing MBA’s policy work related to loan production issues, including the government housing programs operated by FHA, VA, and USDA, as well as secondary and capital markets issues, including agency and non-agency securities markets and the activities of FHFA, Fannie Mae and Freddie Mac, Ginnie Mae, and the Federal Home Loan Banks.

Prior to joining MBA, Dan was a policy advisor at the U.S. Department of the Treasury, where he served on the staff of the Financial Stability Oversight Council. He has also served as an advisor to the majority staff of the Senate Banking Committee, during which time he helped draft the Johnson-Crapo housing finance reform legislation.

Dan holds a Bachelor’s degree in economics and political science from Colgate University and a Master’s in Public Affairs from the Woodrow Wilson School at Princeton University.
Paul Noring, CPA is a Managing Director with Berkeley Research Group based out of Washington, DC. Mr. Noring has over 32 years of banking and capital markets experience. Prior to joining BRG in September 2019, he spent thirteen years at Navigant Consulting where he led the Banking & Capital Markets practice. Prior to that he was a senior officer at Fannie Mae and a Partner in the Banking & Capital Markets group at PricewaterhouseCoopers.

Over the last year, Mr. Noring has been deeply involved in LIBOR transition efforts. He is a member of the Mortgage Bankers Association (MBA) LIBOR Transition working group. He has given speeches, webinars, townhalls and training on the topics to various MBA groups as well as to financial institutions. He has also written thought leadership pieces. He has worked with both mid-size banks and large institutions around their transition efforts. Most of the initial emphasis has been on governance, mobilization, project planning and program management. He has also focused on Ameribor and why it may be a better alternative for certain institutions. He is also actively involved in addressing system considerations associated with moving from simple interest calculations to compound interest.

Mr. Noring has deep prior experience with loan accounting, derivative operations, hedge accounting and asset/liability management. He has worked with all types and sizes of financial institutions from community banks to almost all of the world's largest global institutions. He has also spent significant time interfacing with Boards of Directors and bank regulators.

**LIBOR and Financial Stability Risks**

$200 trillion of outstanding U.S. Dollar LIBOR-indexed contracts

Priced off $500 million of underlying daily transactions

400,000 : 1 ratio
## Estimated U.S. Dollar LIBOR Exposures and Maturities

<table>
<thead>
<tr>
<th>Category</th>
<th>Volume ($ Trillions)</th>
<th>Share Maturing by end 2021</th>
<th>Share Maturing by end 2023</th>
<th>Share Maturing after 2030</th>
<th>Share Maturing after 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Over-the-Counter Derivatives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rates Swaps</td>
<td>81</td>
<td>66%</td>
<td>88%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Forward Rate Agreements</td>
<td>34</td>
<td>10%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Interest Rate Options</td>
<td>12</td>
<td>65%</td>
<td>68%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Cross Currency Swaps</td>
<td>18</td>
<td>88%</td>
<td>93%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Exchange-Traded Derivatives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rate Options</td>
<td>34</td>
<td>99%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Interest Rate Futures</td>
<td>11</td>
<td>99%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Business Loans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syndicated Loans</td>
<td>1.5</td>
<td>83%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Non-syndicated Business Loans</td>
<td>0.8</td>
<td>86%</td>
<td>97%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Non-syndicated CRE/Commercial Mortgages</td>
<td>1.1</td>
<td>83%</td>
<td>94%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Consumer Loans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail Mortgages</td>
<td>1.2</td>
<td>57%</td>
<td>82%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Other Consumer Loans</td>
<td>0.1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Securitizations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mortgage-Backed Securities (including CMOs)</td>
<td>1.0</td>
<td>57%</td>
<td>81%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Collateralized Loan Obligations</td>
<td>0.4</td>
<td>26%</td>
<td>72%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Asset-Backed Securities</td>
<td>0.2</td>
<td>55%</td>
<td>78%</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Collateralized Debt Obligations</td>
<td>0.2</td>
<td>48%</td>
<td>73%</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>19.9</td>
<td>82%</td>
<td>93%</td>
<td>8%</td>
<td>2%</td>
</tr>
</tbody>
</table>


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## The Alternative Reference Rates Committee (ARRC)

- The ARRC is a group of private-market participants convened to help ensure a successful transition from U.S. Dollar LIBOR to a more robust reference rate. The Federal Reserve Board and the Federal Reserve Bank of New York jointly convened the ARRC in 2014.

### ARRC Members
- ABA
- AXA
- Bank of America
- BlackRock
- Citigroup
- CME Group
- CREFC
- Deutsche Bank
- Fannie Mae
- FHLMC-ND
- Freddie Mac
- GE Capital
- GFOA
- Goldman Sachs
- HSBC
- ICBA
- ICE
- ISDA
- JPMorgan Chase
- LCH
- LSTA
- MetLife
- Morgan Stanley
- NACT
- PIMCO
- Prudential
- SFA
- SIFMA
- TD Bank
- Wells Fargo
- World Bank

### ARRC Working Groups
- Accounting/Tax
- Business Loans
- Consumer Products
- Floating Rate Notes
- Legal
- Market Structure and Paced Transition
- Operations/Infrastructure
- Outreach/Communications
- Regulatory Issues
- Securitizations
- Term Rate
The Secured Overnight Financing Rate (SOFR)

- In 2017, the ARRC identified SOFR as its preferred alternative to U.S. Dollar LIBOR.

- SOFR is a broad measure of the cost of borrowing cash overnight, collateralized by Treasury securities.
  - Based on the overnight Treasury repo market (over $1 trillion in daily volume)
  - Deemed compliant by the International Organization of Securities Commissions (IOSCO)
  - Produced by the New York Fed, in cooperation with the Office of Financial Research
  - Published daily at approximately 8:00am Eastern

- Daily publication of SOFR began in April 2018, though historical indicative data is available dating back to August 2014.

Transitioning Away from LIBOR

- “Because U.S. dollar LIBOR is used in such a large volume and broad range of financial products and contracts, the risks surrounding it pose a potential threat to the safety and soundness of individual financial institutions and to financial stability.”
  ---Alternative Reference Rates Committee (ARRC) Second Report

- “In my view, the biggest challenge isn’t liquidity or the creation of a term rate; it’s a willingness on the part of the market to stop using LIBOR. We need a mindset shift where firms realize that every new U.S. Dollar LIBOR contract written digs a deeper hole that will be harder to climb out of.”
  ---New York Fed President and CEO, John C. Williams

- “Transition is not just about new business but about converting outstanding, or legacy, LIBOR contacts...we have suggested market participants very carefully consider their fallback provisions...in particular, we have encouraged market participants to look at provisions that would work not only when LIBOR ceases, but also in the event that FCA announces the rate will no longer be representative.”
  ---U.K. Financial Conduct Authority Chief Executive, Andrew Bailey
### Key Single Family Developments

<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 17, 2019</td>
<td>Fannie / Freddie – Seasoned ARM Loans</td>
<td>Stopped purchasing or securitizing LIBOR ARM loans that were seasoned more than six months (from the first payment date).</td>
</tr>
<tr>
<td>July 11, 2019</td>
<td>ARRC White Paper – Options for Using SOFR in ARMs</td>
<td>Thirteen-page white paper and one-page summary (see next section).</td>
</tr>
<tr>
<td>July 12, 2019</td>
<td>ARRC Consultation – Regarding More Robust Fallback Contract Language for New Closed-end Residential ARMs</td>
<td>Thirteen questions on triggers and replacement index as well as unintended consequences and impact on originations.</td>
</tr>
<tr>
<td>September 27, 2019</td>
<td>FHFA Supervisory Letter to FHLBanks and Office of Finance</td>
<td>By December 31, 2019, FHLBanks and Office of Finance should stop purchasing investments that reference LIBOR and mature after December 31, 2021, and should, by March 31, 2020 (subsequently extended to June 30, 2020), no longer enter into new financial assets, liabilities, and derivatives that reference LIBOR and mature after December 31, 2021 for all product types other than investments. The above phaseouts do not apply to collateral accepted by the FHLBanks from members for advances – however additional reporting is required.</td>
</tr>
</tbody>
</table>

### Key Single Family Developments (cont.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 15, 2019</td>
<td>ARRC Recommendations Regarding More Robust LIBOR Fallback Contract Language for New Closed-end ARMs</td>
<td>Triggers = i) Administrator (i.e. ICE) permanently or indefinitely stopped providing LIBOR; or ii) Administrator or its regulator (i.e. FCA) issues an official public statement that LIBOR is no longer reliable or representative. Note Holder will select a new index (Replacement Index) and may also select a new margin, as follows: 1) Replacement index selected or recommend for use in consumer products...by Fed, NY Fed, or a committee endorsed or conveyed by either (i.e. ARRC). 2) If “1” not selected or recommended, Note Holder will make a “reasonable, good faith” [determination that] “will minimize any changes in the cost of the loan”…</td>
</tr>
<tr>
<td>February 5, 2020</td>
<td>Fannie Mae – Lender Letter &amp; Freddie Mac – Selling Update</td>
<td>New language will be required for single-family Uniform ARM instruments closed on or after June 1, 2020. All LIBOR-based single-family and multifamily ARMs must have loan application dates on or before September 30, 2020 to be eligible for acquisition; and, Acquisitions of single-family and multifamily LIBOR ARMs will cease on or before December 31, 2020. Cease purchasing CMT-indexed ARMs at some point in 2021.</td>
</tr>
</tbody>
</table>
Key Single Family Developments (cont.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 16, 2020</td>
<td>FHIBanks and Office of Finance Press Release</td>
<td>FHFA extended to June 30, 2020 (versus prior March 31, 2020 date) the FHIBanks' ability to enter into LIBOR-based instruments that mature after December 31, 2021, except for investments and option embedded products.</td>
</tr>
</tbody>
</table>
| April 1, 2020 | Fannie Mae – Selling Guide Announcement SEL 2020-02, Freddie Mac – Bulletin 2020-9 | Fannie: Whole loan and MBS pricing and deliveries of single-family SOFR ARMs will begin on August 3, 2020. Lenders may begin delivery of whole loans on this date and delivery of loans in MBS with issue dates beginning August 1, 2020. All existing pooling policies will apply to SOFR ARMs in MBS.  
Freddie: Sellers will be able to take out 30-day average SOFR cash contracts in Loan Selling Advisor to deliver SOFR-indexed ARMs beginning November 16, 2020. Sellers will be able to take out 30-day average SOFR guarantor contracts in Loan Selling Advisor to deliver mortgages into a WAC ARM PC beginning November 16, 2020 for mortgages with settlement dates on or after December 1, 2020.  
Based on 30-day average SOFR as published by the Federal Reserve Bank of New York.  
New Promissory Notes included. |

ARRC White Paper on Options for Using SOFR in Residential ARMs

- On July 11, the ARRC published a [white paper](#) detailing how an average of SOFR could be used in newly-issued adjustable-rate mortgages.

<table>
<thead>
<tr>
<th></th>
<th>Current LIBOR ARM Model</th>
<th>Proposed Models of SOFR ARMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed-Rate Period</td>
<td>3, 5, 7, or 10 Years</td>
<td>No Change</td>
</tr>
<tr>
<td>Floating-Rate Index</td>
<td>1-Year LIBOR</td>
<td>30-Day or 90-Day Average of SOFR</td>
</tr>
<tr>
<td>Floating-Rate Adjustment Period</td>
<td>1 Year</td>
<td>6 Months</td>
</tr>
<tr>
<td>Rate/Payment Determination</td>
<td>New Rate Determined 45 Days in Advance of Rate Adjustment</td>
<td>No Change</td>
</tr>
<tr>
<td>Initial Caps</td>
<td>2 Percent for 3/1 and 5/1 ARMs; 5 Percent for 7/1 and 10/1 ARMs</td>
<td>No Change</td>
</tr>
<tr>
<td>Subsequent Caps</td>
<td>2 Percent</td>
<td>1 Percent</td>
</tr>
<tr>
<td>Lifetime Cap</td>
<td>5 Percent</td>
<td>No Change</td>
</tr>
<tr>
<td>Margin</td>
<td>2.25 Percent</td>
<td>Likely in Range of 2.75 to 3 Percent</td>
</tr>
</tbody>
</table>
ARRC Recommendations on Fallback Contract Language

On July 12, the ARRC released a consultation on fallback contract language for residential ARMs.

Most current ARM Notes or riders include language to the effect of:

- “If the Index is no longer available, the Note Holder will choose a new index that is based upon comparable information.”

Potential problems with this language include:

- Does not provide much clarity about when an index is no longer available
  - No longer published?...No longer deemed suitable by market participants?...No longer deemed suitable by one or more regulators?
- Does not provide much clarity about the process of selecting a replacement index
  - What is comparable information?...What is the timeline for use of a replacement index?
- Does not permit margin adjustments

The ARRC finalized its recommended fallback contract language on November 15, 2019.

ARRC Recommendations on Fallback Contract Language – Triggers

The recommended fallback contract language includes two specific triggers:

- The Administrator has permanently or indefinitely stopped providing the Index to the general public; or
- The Administrator or its regulator issues an official public statement that the Index is no longer reliable or representative.

The first trigger would be invoked if publication of LIBOR ceased. The second trigger would apply in situations in which LIBOR may still be published, but its quality had materially deteriorated in objectively measurable ways or it had been rendered unusable.

- In the case of the second trigger, the relevant regulator for LIBOR is the U.K. Financial Conduct Authority – not a U.S. regulator.
ARRC Recommendations on Fallback Contract Language – Replacement Index and Margin

The recommended fallback contract language includes a two-step waterfall to select the replacement index:

• **Step 1:** Replacement index selected or recommended by the Federal Reserve Board, the Federal Reserve Bank of New York, or a committee endorsed or convened by the Federal Reserve Board or the Federal Reserve Bank of New York.

• **Step 2:** Replacement index determined by the Note Holder, with possible adjustment to the loan’s margin to account for differences between LIBOR and the chosen replacement index.

For **Step 1**, the ARRC will work with stakeholders to develop and recommend a spread adjustment and corresponding spread-adjusted, SOFR-based replacement. Note that the ARRC announced a recommended spread adjustment methodology on April 8, 2020.

For **Step 2**, if there is no index selected or recommended in Step 1, the Note Holder would choose a replacement index, similar to the language in many current contracts. The recommended language states the possibility that the Note Holder may determine an adjustment to the margin.

MBA Consumer Disclosure Template

On June 6, 2019, MBA released a consumer disclosure template for consumers obtaining new adjustable-rate mortgages.

• The disclosure template is intended to communicate to consumers that any LIBOR-indexed ARMs that they are considering are likely to experience a change in the index during the life of the loan.

• The disclosure template:
  - Explains the concept of an index
  - Notifies the consumer that LIBOR is likely to be discontinued
  - Informs the consumer that, in the event LIBOR is unavailable, an alternative index will be selected
  - Explains that most other terms of the loan will not change

MBA has begun work on a similar disclosure template for consumers with existing LIBOR-indexed ARMs.
Resources

ARRC Website:
- https://www.newyorkfed.org/arrc

ARRC White Paper on Use of SOFR for Residential ARMs:

ARRC Recommended Fallback Contract Language for New Closed-End, Residential ARMs:

SOFR Data:
- apps.newyorkfed.org/markets/autorates/sofr

MBA Webpage on the LIBOR Transition:

Appendix I – New SOFR ARM Product Terms

- Key Product Characteristics for New Fannie Mae SOFR ARMs:

<table>
<thead>
<tr>
<th>ARM Product</th>
<th>Max Margin</th>
<th>ARM Subtypes and Prefix</th>
<th>Fixed Rate Period</th>
<th>Reset Period</th>
<th>First Rate Change Caps</th>
<th>Subsequent Rate Change Caps</th>
<th>Life Cap (Ceiling)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Year (3yr/6m)</td>
<td>300 bps</td>
<td>85A SO</td>
<td>3 years</td>
<td>6 months</td>
<td>+2%/−2%</td>
<td>+1%/−1%</td>
<td>Up to +5%</td>
</tr>
<tr>
<td>5 Year (5yr/6m)</td>
<td>300 bps</td>
<td>85B SO</td>
<td>5 years</td>
<td>6 months</td>
<td>+2%/−2%</td>
<td>+1%/−1%</td>
<td>Up to +5%</td>
</tr>
<tr>
<td>7 Year (7yr/6m)</td>
<td>300 bps</td>
<td>85C SO</td>
<td>7 years</td>
<td>6 months</td>
<td>+5%/−5%</td>
<td>+1%/−1%</td>
<td>Up to +5%</td>
</tr>
<tr>
<td>10 Year (10yr/6m)</td>
<td>300 bps</td>
<td>85D SO</td>
<td>10 years</td>
<td>6 months</td>
<td>+5%/−5%</td>
<td>+1%/−1%</td>
<td>Up to +5%</td>
</tr>
</tbody>
</table>
Appendix I – New SOFR ARM Product Terms (cont.)

- The following nonconvertible SOFR-indexed ARMs will be eligible for purchase by Freddie Mac under the ARM Cash and WAC ARM Guarantor programs:

<table>
<thead>
<tr>
<th>Reference Product Label</th>
<th>Index Source Type</th>
<th>Interest and Payment Adjustment Index</th>
<th>Initial Fixed Period Effective Months Count</th>
<th>Per Change Rate Adjustment Frequency Months Count</th>
<th>Initial Cap</th>
<th>Periodic Cap</th>
<th>Life Cap</th>
<th>Min Margin (bps)</th>
<th>Max Margin (bps)</th>
<th>Prefix (WAC ARM Guarantor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/6-Month ARM</td>
<td>30-day Average SOFR</td>
<td>45</td>
<td>36</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>100</td>
<td>300</td>
<td>8A</td>
</tr>
<tr>
<td>5/6-Month ARM</td>
<td>30-day Average SOFR</td>
<td>45</td>
<td>60</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>100</td>
<td>300</td>
<td>8B</td>
</tr>
<tr>
<td>7/6-Month ARM</td>
<td>30-day Average SOFR</td>
<td>45</td>
<td>84</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>100</td>
<td>300</td>
<td>8C</td>
</tr>
<tr>
<td>10/6-Month ARM</td>
<td>30-day Average SOFR</td>
<td>45</td>
<td>120</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>100</td>
<td>300</td>
<td>8D</td>
</tr>
</tbody>
</table>

Appendix II – Fannie SOFR Note
Questions?

Thank You!

Paul Noring
Managing Director
Berkeley Research Group, LLC

Dan Fichtler
Associate Vice President
Mortgage Bankers Association