Federal Home Loan Banks

Update to credit analysis following ratings affirmation

Summary
The Federal Home Loan Bank System's (FHLBank System) Aaa long-term senior unsecured debt rating and Prime-1 short-term issuer rating were recently affirmed and reflect the combination of the FHLBank System's a1 baseline credit assessment (BCA), our assumption of a very high likelihood of support from the US Government (Aaa stable), and high dependence between the FHLBanks and the US Government. The rating outlook is stable.

FHLBank System’s a1 BCA reflects its excellent asset quality, good earnings stability and strong capitalization. In arriving at the FHLBank System’s BCA, we consider the eleven FHLBanks’ individual BCAs, ten of which are a1 (FHLBank New York’s BCA is aa3), and the credit profile of the FHLBank System as if it were a combined entity. The FHLBank System’s BCA also incorporates the benefits to its debt holders from the joint and several liability of all eleven banks for the System’s consolidated bonds and consolidated discount notes.

The Aaa debt and deposit ratings capture the FHLBanks’ special role as providers of liquidity to the US banking system and their status as government-sponsored enterprises (GSEs). Both attributes contribute to our view that there is a very high likelihood of support from the US Government in the event that an individual FHLBank or the FHLBank System were in danger of default.

The stable outlook on the ratings for the FHLBank System is in line with our stable outlook on the rating of the US Government. Any rating actions on the US Government would likely result in the FHLBank System’s long-term bond rating moving in lock step with any US sovereign rating action.

Exhibit 1
Rating Scorecard - Key Financial Ratios[1]

[1] All ratios are as of 06/30/2019. Net income % tangible assets is annualized.
Source: Moody’s Financial Metrics
Credit strengths

» Joint and several liability reduces default risk of the FHLBank System’s consolidated obligations

» Although narrowly focused, the FHLBanks are central liquidity providers to US banks, underscoring their importance to the US financial system

» Excellent credit quality of FHLBanks’ advance portfolio, investment portfolio (excluding a small private label RMBS book), and mortgage portfolio minimizes asset risk

Credit challenges

» Narrow charter and bank consolidation limit growth

» Substantial single borrower concentrations at the individual FHLBank level

» Reliance on confidence-sensitive market funding, but market access is strong due to GSE status

Outlook

Our stable outlook on the FHLBank System’s long-term bond rating reflects the stable outlook of the US government’s Aaa debt rating.

Factors that could lead to an upgrade

At Aaa, an upgrade of the FHLBank System’s long-term debt is not possible. A higher BCA could occur if the FHLBanks re-focused their businesses such that advances represent more than 70% of assets while maintaining: 1) strong profitability, 2) a stable member risk profile, 3) continued strong asset risk, including modest asset-liability and operational risk, and 4) robust capital and liquidity.

Factors that could lead to a downgrade

Any negative rating action on the US Government would likely result in the FHLBank System’s long-term senior unsecured debt rating moving in lock step with any US sovereign rating action.

Barring a downgrade of the US sovereign rating, a decline in our government support assumptions for the FHLBank System, or a material downgrade of the FHLBank System’s a1 BCA, we do not expect changes to the FHLBank System’s debt and issuer ratings. This is due to the fact that the ratings incorporate an expectation of a very high degree of US Government support.

Factors that could lead to a downgrade of the FHLBank System’s BCA of a1 include materially higher loss expectations on the FHLBanks’ mortgage holdings and/or private-label MBS portfolios, multiple quarterly net losses or significant asset-liability mismatches. In addition, an expansion of the FHLBanks’ risk profile, for example due to a change in their government mandate or self-initiated, could result in lower standalone BCAs. The BCA for the FHLBank System could then be downgraded based on downgraded BCAs at individual FHLBanks.
Key indicators

Exhibit 2
Federal Home Loan Banks (Consolidated Financials) [1]

<table>
<thead>
<tr>
<th></th>
<th>06-19²</th>
<th>12-18²</th>
<th>12-17²</th>
<th>12-16²</th>
<th>12-15²</th>
<th>CAGR/Avg³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets (USD Billion)</td>
<td>1,122.0</td>
<td>1,102.9</td>
<td>1,103.5</td>
<td>1,056.7</td>
<td>969.2</td>
<td>4.3⁴</td>
</tr>
<tr>
<td>Net Income / Tangible Assets (%)</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3⁵</td>
</tr>
<tr>
<td>Liquid Assets (GSE) / Short Term Debt (%)</td>
<td>33.7</td>
<td>27.6</td>
<td>27.8</td>
<td>27.2</td>
<td>28.1</td>
<td>28.9⁵</td>
</tr>
<tr>
<td>Tangible Common Equity / (Total Assets - Derivatives) (%)</td>
<td>5.2</td>
<td>5.4</td>
<td>5.2</td>
<td>5.1</td>
<td>5.1</td>
<td>5.2⁵</td>
</tr>
<tr>
<td>Mortgage Loans / Total Assets (%)</td>
<td>5.9</td>
<td>5.7</td>
<td>4.9</td>
<td>4.6</td>
<td>4.6</td>
<td>5.1⁵</td>
</tr>
</tbody>
</table>


Source: Moody’s Investors Service; Company Filings

Profile

The FHLBanks are federally-chartered GSEs that were organized under the Federal Home Loan Bank Act of 1932. The FHLBanks together with the Office of Finance comprise the FHLBank System. Each of the FHLBanks and the Office of Finance operate under the supervisory and regulatory framework of the Federal Housing Finance Agency (FHFA). Each FHLBank operates as a separate entity with its own management, employees, and board of directors.

The FHLBanks’ primary business is lending to member institutions, primarily banks, savings institutions and credit unions, in the form of advances, which are generally short-term and over-collateralized, minimizing the credit risk on these loans. In addition, the FHLBanks benefit from their statutory lien priority with respect to pledged member assets. The FHLBanks also purchase mortgage loans, principally 15-30 year conventional and government-guaranteed or insured fixed-rate loans. The FHLBanks also invest in securities, principally MBS, subject to an investment limit of three times regulatory capital without approval by the FHFA. Some FHLBanks offer correspondent services to their member institutions, including wire transfer, security safekeeping, and settlement services.

Detailed rating considerations

Asset quality and credit risk management

Excluding a small non-agency MBS portfolio that has shrunk significantly in recent years, we believe the FHLBank System’s asset quality is exceptional. In particular, advances, which represent around two-thirds of total assets, are over-collateralized and have never resulted in a loss. This is reflected in the aa2 assigned score for Asset Risk in our scorecard, shown at the back of this report.

As shown in the table below, the eleven FHLBanks have modestly different asset mixes, but advances constitute the majority of assets at most of the banks. Each FHLBank has sole credit approval power and establishes its own underwriting standards and eligible collateral within FHFA guidelines. Eligible collateral includes current first-lien residential mortgages (overwhelmingly single-family) or securities backed by such mortgages, Federal Agency securities, FHLBank deposits and other real estate-related assets approved by the relevant FHLBank’s board of directors.

Investments, which are primarily high quality US government and agency guaranteed securities, comprise most of the remainder of the banks’ balance sheets. Although no FHLBank has purchased private-label mortgage-backed securities since 2008 and that portfolio is much reduced in size, in our view, the remaining exposures present some credit risk to the respective FHLBanks.

The FHLBanks’ conforming mortgage portfolio programs, MPF and MPP, provide members with an alternative to Fannie Mae and Freddie Mac execution. The FHLBank System’s mortgage portfolio represented 5.9% of total assets as of June 30, 2019 versus 5.7% as of December 31, 2018. The FHLBanks’ mortgage assets are more susceptible to credit losses, and in particular, carry heightened operational complexity relative to the FHLBanks’ core lending business. However, credit risk performances of MPF and MPP programs have been very good to date, exceeding that of similar programs of Fannie Mae and Freddie Mac. This excellent track record reflects the high quality of mortgage assets purchased and credit enhancements of the FHLBanks’ MPF and MPP programs.
Exhibit 3

Asset mix of the FHLBanks

As of 06/30/2019
Source: Company Filings

Capital adequacy
Each FHLBank is required by legislation to maintain minimum regulatory capital of 4% of its total assets. As of 30 June 2019, the capital ratio of the FHLBank System was 5.16%, down slightly from 5.36% at year end 2018. In our view, capital levels reflect the low risk profile of the FHLBank System’s asset base, which is primarily comprised of advances to members. The aa1 assigned score for Capital in our scorecard incorporates our estimate of the FHLBank System’s TCE ratio on a risk-weighted basis, which is very strong.

Profitability
FHLBank System’s low but consistent profitability (as measured by ROAA) reflects the primarily low risk profile of its asset base. For the six months ended June 2019, the FHLBank System’s ROAA was 0.30%, down slightly from 0.35% for the same period in the prior year, compared to a median of 1.20% for A-rated US Banks in the first half of 2019. The baa1 assigned score for Profitability in our scorecard reflects the extremely low earnings volatility.

Liquidity and Funding
The FHLBank System’s GSE status provides it with consistent and stable access to the debt markets and informs the baa1 assigned score for Funding Structure in our scorecard. The FHLBanks’ internal sources of liquidity are modest, but have strengthened with recent regulation.

Specifically, FHFA, the regulator of the FHLBanks, issued updated liquidity guidance in the summer of 2018 that will take full effect on 31 December 2019. Under the updated guidance, the FHFA established requirements for the FHLBanks’ base case liquidity and implemented new funding gap metrics for three-month and one-year maturity horizons. In addition, the guidance addressed liquidity stress testing and contingency funding plans. We expect that all FHLBanks will be in compliance with the updated liquidity requirements.

Special role as a provider of liquidity to US financial institutions
As GSEs, the FHLBanks’ ability to access funding throughout the cycle underpins their importance to the financial system. This is particularly true during times of extreme market disruption when they become a primary source of contingent liquidity for their members. As shown below, at the height of the recent financial crisis, advances (specifically to regulated depository members, excluding insurance company members and other non-members) climbed a few hundred billion dollars for the system as a whole before receding as the financial markets and overall economy recovered.
Environmental, social and governance considerations

The FHLBank System’s exposure to environmental risks is low, consistent with our general assessment for the global banking sector. See our Environmental risk heatmap for further information.

Overall, we consider banks to face moderate social risks. The most relevant social risks for banks arise from the way they interact with their customers. Social risks are particularly high in the area of data security and customer privacy, which is partly mitigated by sizeable technology investments and banks’ long track record of handling sensitive client data.

Governance is highly relevant for the FHLBank System, as it is to all players in the banking industry. Corporate governance weaknesses can lead to deterioration in a bank’s credit quality, while governance strengths can benefit a bank’s credit profile. Governance risks are largely internal rather than externally driven, and for the FHLBank System we do not have any particular governance concerns. Nonetheless, corporate governance remains a key credit consideration and requires ongoing monitoring.

GSE reform

On 5 September, the U.S. Department of the Treasury published recommended housing reforms. Although the focus of the recommendations were centered on Fannie Mae and Freddie Mac, if implemented, the proposals would result in reduced market share for those entities. As a consequence, traditional banks’ market share of US mortgages would increase, which would enhance the FHLBanks’ market position.

The recommendations also suggested that the regulatory rule excluding captive insurance companies from FHLBank membership should be revisited in light of the continued evolution of the housing finance system. Allowing non-bank mortgage companies FHLBank membership would likely be credit negative for the FHLBanks as captive insurance companies and their affiliates are financially weaker than traditional FHLBank bank and insurance members. The timing and likelihood of all these proposals is uncertain.

Methodology and scorecard

Our BCA scorecard is designed to capture, express and explain in summary form our Rating Committee’s judgment. When read in conjunction with our research, a fulsome presentation of our judgment is expressed. As a result, the output of our BCA scorecard may materially differ from that suggested by raw data alone (though it has been calibrated to avoid the frequent need for strong divergence). The BCA scorecard output and the individual scores are discussed in rating committees and may be adjusted up or down to reflect conditions specific to each rated entity. We also assess the level of support and, consequently, the ratings uplift from the US Government (Aaa stable) using our Government-Related Issuers methodology.
### Exhibit 5

**Rating Factors**

**Federal Home Loan Banks**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Historic Ratio</th>
<th>Initial Score</th>
<th>Expected Trend</th>
<th>Assigned Score</th>
<th>Key driver #1</th>
<th>Key driver #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solvency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset Risk</td>
<td>0.1%</td>
<td>aa1</td>
<td>→</td>
<td>aa2</td>
<td>Long-run loss performance</td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>19.7%</td>
<td>aa1</td>
<td>→</td>
<td>aa1</td>
<td>Risk-weighted capitalisation</td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>0.1%</td>
<td>ba2</td>
<td>→</td>
<td>ba1</td>
<td>Earnings quality</td>
<td></td>
</tr>
<tr>
<td><strong>Combined Solvency Score</strong></td>
<td></td>
<td></td>
<td></td>
<td>aa3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Liquidity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funding Structure</td>
<td>94.1%</td>
<td>caa3</td>
<td>→</td>
<td>ba1</td>
<td>Market funding quality</td>
<td></td>
</tr>
<tr>
<td>Liquid Resources</td>
<td>19.7%</td>
<td>ba2</td>
<td>→</td>
<td>ba2</td>
<td>Expected trend</td>
<td></td>
</tr>
<tr>
<td><strong>Combined Liquidity Score</strong></td>
<td></td>
<td></td>
<td></td>
<td>b2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Financial Profile**

**Qualitative Adjustments**

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Business Diversification</th>
<th>Opacity and Complexity</th>
<th>Corporate Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Total Qualitative Adjustments**

0

**Source:** Moody’s Investors Service

### Exhibit 6

**Ratings**

**Category**

**FEDERAL HOME LOAN BANKS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Moody’s Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlook</td>
<td>Stable</td>
</tr>
<tr>
<td>Senior Unsecured</td>
<td>Aaa</td>
</tr>
</tbody>
</table>

**ST Issuer Rating**

P-1

**Source:** Moody’s Investors Service