

# **2015 Annual Stress Test Disclosure**

***Results of the Federal Housing Finance Agency  
Supervisory  
Severely Adverse Scenario***

**July 23, 2015**

**As Required by the Dodd-Frank  
Wall Street Reform and Consumer Protection Act**

# Executive Summary

## Stress Test Background

- The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) requires certain financial companies with total consolidated assets of more than \$10 billion, and which are regulated by a primary Federal financial regulatory agency, to conduct annual stress tests to determine whether the companies have the capital necessary to absorb losses as a result of adverse economic conditions.
- In September 2013, Federal Housing Finance Agency (FHFA), regulator of the Federal Home Loan Banks (FHLBanks), implemented annual stress testing rules for the FHLBanks as required by the Dodd-Frank Act.
- In accordance with these rules, the FHLBank Chicago is publicly disclosing the results of its stress test in this document.

## Stress Test Requirements

- FHFA provided inputs and key assumptions for the severely adverse scenario.
- Results are projected over the nine quarter period from the fourth quarter of 2014 to the fourth quarter of 2016, starting with actual balances as of September 30, 2014. This period is defined as the “plan horizon”.
- The stress test results under the FHFA severely adverse scenario, as disclosed in this document or otherwise, should not be viewed as forecasts of expected or likely outcomes of future results. Rather, these modeled projections are based solely on the FHFA’s severely adverse scenario and other specific required assumptions.

# Executive Summary (cont.)

## Stress Test Results

- Our stress test results demonstrate capital adequacy under the FHFA's severely adverse economic conditions as of December 31, 2016, and reflect compliance with all regulatory capital requirements throughout all nine quarters covered by the stress test.
  - Our regulatory capital ratio (which is the sum of capital stock and retained earnings divided by total assets) at December 31, 2016, is 6.82%, compared to the regulatory requirement of 4.00%. Regulatory capital increases by \$265 million over the plan horizon as projections for net interest income and other non-interest income offset estimated credit losses, counterparty default losses, and mark-to-market losses on the Bank's trading securities.
  - Our regulatory leverage capital ratio (which is the sum of capital stock and retained earnings multiplied by 1.5 divided by total assets) at December 31, 2016, is 10.23%, exceeding the regulatory requirement of 5.00%.
  - Total GAAP<sup>1</sup> Capital at December 31, 2016, is \$2.14 billion. GAAP capital declines by \$2.2 billion driven by the impact on Other Accumulated Comprehensive Income of the global market shocks applied to the Bank's Available-for-Sale portfolio and certain private label mortgage-backed securities classified as Held-to-Maturity.
  - The severely adverse scenario results assume we declare dividends and repurchase excess capital stock during the nine quarter period consistent with our current business plan. However, any distribution of dividends or repurchases of excess capital stock remain subject to the approval of our board of directors.

## Stress Test Use/Governance

- Stress testing has evolved as an important analytical tool for evaluating capital adequacy under severely adverse economic conditions. We regularly use such stress tests, including those annual stress tests required by the Dodd-Frank Act, in our capital planning to measure our exposure to material risks and evaluate the adequacy of capital resources available to absorb potential losses arising from those risks.
- We take the stress test results into account when making changes to our capital structure; when assessing our exposures, concentrations and risk positions; and in improving our overall risk management.
- The overall stress test process and these results have been reviewed with our board of directors.

<sup>1</sup> Generally Accepted Accounting Principles in the United States.

# Stress Test Components

## Net interest income + other non-interest income, net

- Net interest income (expense), operating expenses, and other non-interest income (expense).

## (Provision) benefit for credit losses on mortgage loans

- Provisions for credit losses related to mortgage loans held for portfolio.

## OTTI credit losses

- Other-than-temporary impairment (OTTI) credit losses for investment securities.

## Mark-to-market gains (losses)

- Mark-to-market gains (losses) related to changes in fair value of derivatives, trading securities, and other gains (losses) on assets and liabilities held at fair value.

## Global market shocks

- Instantaneous global shocks of interest rates, volatility, agency mortgage-backed securities (MBS) option-adjusted spreads (OAS), and non-agency MBS prices applied to trading securities, available-for-sale (AFS) securities, and held-to-maturity (HTM) securities that are deemed to have OTTI losses in the stress test scenario. Global shocks applied to AFS and OTTI HTM securities are included in other comprehensive income (loss).

## Counterparty default losses

- Instantaneous and unexpected default of largest counterparty across secured and unsecured lending, repurchase/reverse repurchase agreements, and derivatives exposures.

# Severely Adverse Scenario Results

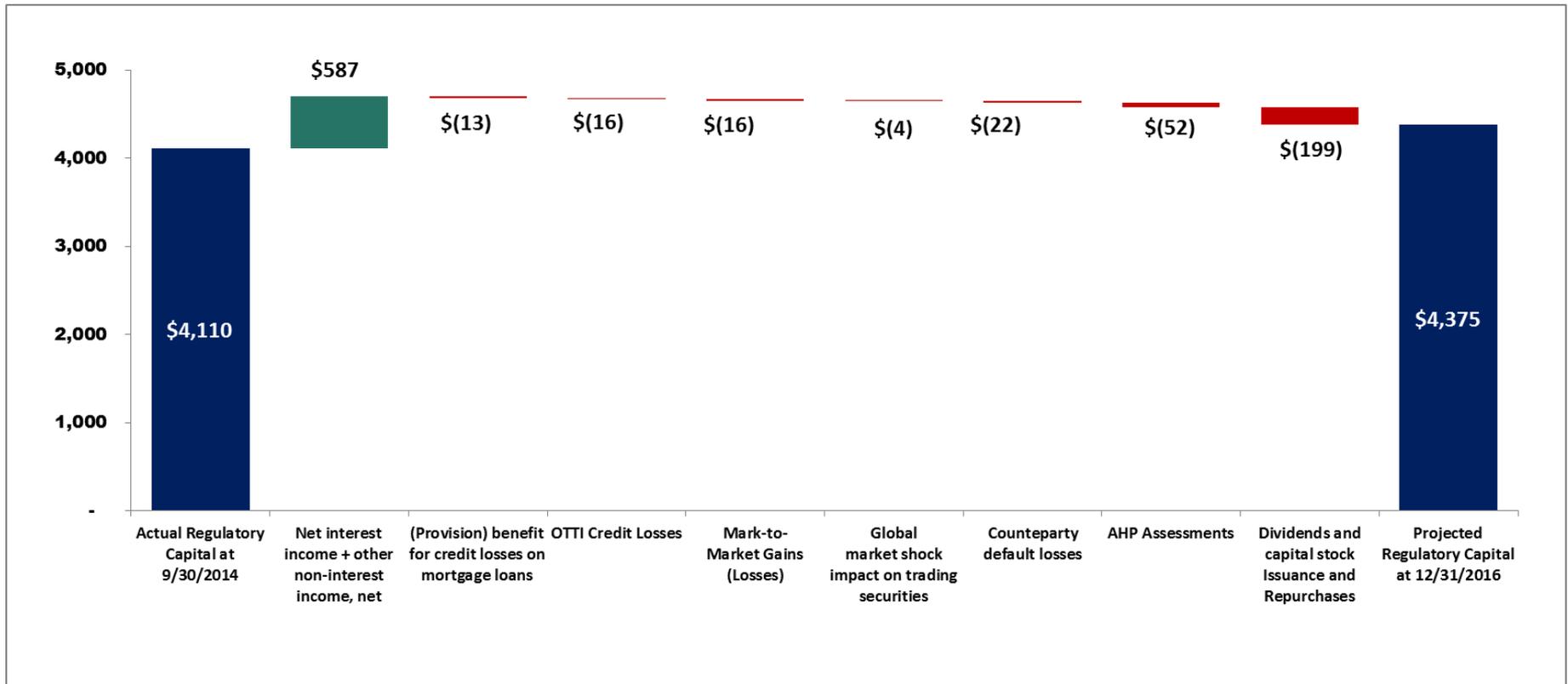
## FHLBank Dodd-Frank Stress Test Template - SEVERELY ADVERSE (Disclosure to Public)

(Dollars in millions)	Projected Financial Metrics	
	<u>(Q4 2014 - Q4 2016)</u>	
Net interest income + other non-interest income, net	\$	587
(Provision) benefit for credit losses on mortgage loans		(13)
OTTI Credit Losses		(16)
Mark-to-market gains (losses)		(16)
Global market shock impact on trading securities		(4)
Counterparty default losses		(22)
AHP Assessments		(52)
<b>Net Income (loss)</b>	<b>\$</b>	<b>464</b>
Other comprehensive income (loss)		(2,470)
Total comprehensive income (loss)		(2,006)
Total Capital (GAAP) - Starting		4,344
Total Capital (GAAP) - Ending		2,144
Regulatory Capital Ratio - Starting		5.71%
Regulatory Capital Ratio - Ending		6.82%

*These projections represent hypothetical internal estimates based on applying rules and conditions set forth in the FHFA's Severely Adverse scenario. These estimates are not forecasts of FHLB-Chicago expected results and any distribution of dividends remains subject to approval by the FHLB-Chicago Board of Directors.*

# Severely Adverse Results – Regulatory Capital Analysis

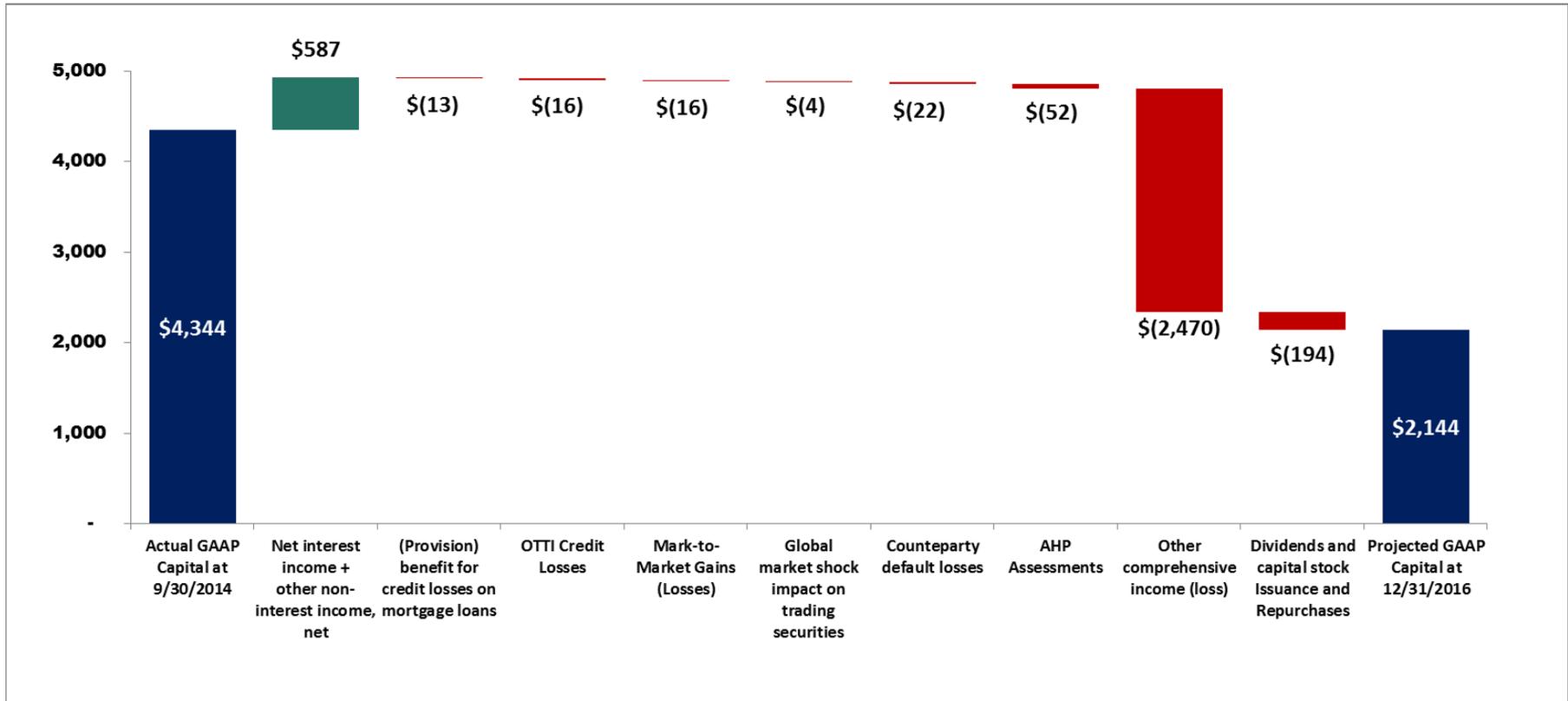
- Regulatory capital, which is defined as the sum of capital stock, retained earnings and mandatorily redeemable capital stock, increases from \$4.1 billion at 9/30/2014 to \$4.4 billion at 12/31/2016.
- All results shown below are modeled projections, except for actual regulatory capital at 9/30/2014.



*These projections represent hypothetical internal estimates based on applying rules and conditions set forth in the FHFA's Severely Adverse scenario. These estimates are not forecasts of FHLB-Chicago expected results and any distribution of dividends remains subject to approval by the FHLB-Chicago Board of Directors.*

# Severely Adverse Results – Total GAAP Capital Analysis

- Total GAAP capital, which is defined as the sum of capital stock, retained earnings and accumulated other comprehensive income (loss), decreases from \$4.3 billion at 9/30/2014 to \$2.1 billion at 12/31/2016.
- All results shown below are modeled projections, except for actual Total GAAP Capital at 9/30/2014.



*These projections represent hypothetical internal estimates based on applying rules and conditions set forth in the FHFA's Severely Adverse scenario. These estimates are not forecasts of FHLB-Chicago expected results and any distribution of dividends remains subject to approval by the FHLB-Chicago Board of Directors.*

# Severely Adverse Scenario

## Key Assumptions Provided by FHFA

Macroeconomic Variables	
Residential House prices ( <i>Peak to trough decline with no recovery over the plan horizon</i> )	-25%
Commercial Real Estate prices ( <i>Peak to trough decline with no recovery over the plan horizon</i> )	-35%
Real Gross Domestic Product ( <i>Annual GDP growth rate</i> )	-3.7% (2015), +2.1% (2016)
Unemployment Rate ( <i>Peak</i> )	10.1% (Q2 2016)
Interest Rate Variables	
30-yr Mortgage Rate ( <i>Average over the plan horizon</i> )	4.7%
10-yr Treasury Rate ( <i>Average over the plan horizon</i> )	1.4%
Global Market Shock	
Instantaneous price shocks on non-agency securities	-14.2% to -76.2%
Instantaneous OAS shocks on:	
Agency security pass-throughs	MBS OAS +150bps
Agency security CMOs and DUS bonds	CMO OAS +190bps
Agency security HECMs	HECM OAS +300bps

# Component Methodologies

## Net interest income + other non-interest income, net

### Description

- Reflects projections of net interest income (expense), operational expenses, and other non-interest income (expense) over the nine-quarter period.
- Material risks covered include interest-rate risk, operational risk, and business risk.

### Methodologies

- Estimates net interest income by projecting portfolio balances, funding mix, and spreads using the macroeconomic variables provided by the FHFA and management assumptions.
- Non-interest income and expense estimated at the business level.
- Estimates of operational risk losses informed by the Bank's historical operational loss experience, internal risk assessments and relevant external data.

## (Provision) benefit for credit losses on mortgage loans

### Description

- Reflects credit loss provisions related to estimated losses on mortgage loans held for portfolio.
- Captures mortgage credit risk.

### Methodologies

- Loan loss reserves forecasted by projecting defaults on the entire loan population and corresponding loss severity over the nine-quarter forecast period. Specifically:
  - Forecasts the amortized balances for the affected population under the FHFA-provided macroeconomic scenario.
  - Forecasts loss severity based on the stressed HPI curves.
- Combines the projected amortized balances and loss severities to compute projected losses.

## OTTI credit losses

### Description

- Reflects credit-related OTTI losses for non-agency investment securities.
- Material risks covered include credit risk associated with the investment portfolio.

### Methodologies

- Estimates OTTI of non-agency MBS, by projecting cash flow shortfalls. Incorporates FHFA provided and internal assumptions for:
  - Housing prices, interest rates, mortgage rates, and monoline insurer performance.

# Component Methodologies (cont.)

## Mark-to-market gains (losses)

### Description

- Reflects mark-to-market gains (losses) from changes in fair value of derivatives, trading securities and assets and liabilities held at fair value due to changes in interest rates.
- Material risk covered includes interest rate risk.

### Methodologies

- Applies FHFA-specified interest rates and internal interest rate assumptions through the use of valuation models to estimate changes in fair value of derivatives, trading securities, and assets and liabilities held at fair value.

## Global market shocks

### Description

- The Global market shock is an instantaneous decline in market value of trading securities, AFS securities, and those HTM securities that are deemed to have OTTI losses. The instantaneous losses and corresponding reduction of capital are taken in the first quarter of the testing horizon without any future recoveries during the nine-quarter planning horizon. This shock is treated as an add-on to the macroeconomic and financial market environment specified in the stress test. Global shocks applied to AFS and OTTI HTM securities are included in other comprehensive income (loss).

### Methodologies

- Applies FHFA-specified shocks, taken in the first quarter of the forecast horizon, to trading securities, AFS securities, and also used to calculate the non-credit component of OTTI associated with HTM securities:
  - Non-Agency Securitized Products: Relative Market Value Shock
  - Municipals: Spread Widening
  - Agencies: OAS Widening

## Counterparty default losses

### Description

- Reflects instantaneous and unexpected default of largest counterparty net exposure.
- Material risks covered include unsecured and secured lending, repurchase/reverse repurchase agreements, and derivative exposures, but excludes advances and overnight positions.

### Methodologies

- Estimates credit loss arising from largest counterparty net stressed exposure by applying global market shock to non-cash securities/collateral held or received and derivatives positions including non cash collateral exchanged.
- Incorporates FHFA-provided and management assumptions for:
  - Interest rates;
  - Credit spreads; and
  - Recovery rates.

# Key Risks Considered

## Market Risk

- The risk to earnings or capital arising from changes in the market value of mortgage loans, investment securities, or other financial instruments due to changes in the level, volatility, or correlations among financial market rates or prices, including interest rates. Specifically, market risk to the FHLBank includes the risk that the market value, or estimated fair value, of the FHLBank's portfolio will decline as a result of changes in interest rates and/or changes in spreads.

## Credit Risk

- The risk to earnings or capital arising from the default, inability, or unwillingness of a borrower, obligor, or counterparty to meet the terms of any financial obligation with the FHLBank or otherwise perform as agreed. Specifically, credit risk to the FHLBank as it pertained to the stress test includes the risk of loss due to defaults on principal and interest payments on advances, MBS and other investments, interest-rate exchange agreements, mortgage loans and unsecured extensions of credit. Based on the FHLBank's collateral management practices and further analysis of existing and supplemental collateral support, the FHLBank projected no credit losses on advances. This is consistent with the history of the FHLBank System which has never experienced a loss on a member advance, even through highly stressful economic environments.

## Operational Risk

- The risk of loss resulting from inadequate or failed processes, systems, human factors or external events. Operational risk is inherent in the FHLBank's business activities and can manifest itself in various ways, including accounting or operational errors, business interruptions, fraud and technology failures. This definition includes legal risk, which is the risk of loss arising from defective transactions, litigation or claims made, or the failure to adequately protect company-owned assets.

## Business Risk

- The risk of an adverse effect on the FHLBank's profitability resulting from external factors that may occur in both the short and long term. Business risk includes the impact of regulatory risk. Declines in business may affect the FHLBank's capital levels by reducing its activity-based capital stock balance and slowing the pace at which the FHLBank can build retained earnings. Additionally, the reduction in capital levels will limit the FHLBank's ability to purchase additional investments, thereby further limiting potential income and growth.

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This report contains forward-looking statements and projections that involve risk or uncertainty. Forward-looking statements in this report include projections of our financial results and conditions under a hypothetical scenario incorporating a set of assumed economic conditions prescribed by our regulator. These projections are not intended to be our forecast of expected future economic or financial conditions or a forecast of our expected future financial results or conditions, but rather reflect possible results under the prescribed hypothetical scenario. Our future financial results and conditions will be influenced by actual economic and financial conditions and various other factors, including but not limited to, those described in our reports filed with the Securities and Exchange Commission and available on our website at [www.fhlbc.com](http://www.fhlbc.com). In addition, certain information included here speaks only as of the particular date or dates included in this report, and the information in the report may have become out of date. We do not undertake an obligation, and disclaim any duty, to update any of the information in this report.