

Milliman Response
FHFA Proposal Capital Framework
Treatment of Credit Risk Transfer Securities and Reinsurance

Executive Summary

Milliman recognizes the significant efforts of the Federal Housing Finance Agency (FHFA) in developing the proposed capital rule. The proposed rule is broad in scope and thorough.

With respect to credit risk transfer (CRT) transactions, there are aspects of the proposed capital framework that result in uneconomical capital charges for CRT transactions and may not fully recognize the benefits of CRT as an effective source of capital. As documented by other commentators including Moody's Economy.com¹, Freddie Mac and Fannie Mae transfer interest rate and market risk to third party market participants and retain mortgage credit risk. CRT is an effective tool for Freddie Mac and Fannie Mae to manage and transfer their mortgage credit risk to market participants and provides many benefits to the mortgage market including: transparency on the lending activities of Freddie Mac and Fannie Mae, independent credit risk assessments and real-time market pricing of the risk, diverse sources of capital dedicated to providing mortgage credit, and a proven mechanism to attract such capital during stress periods.

The capital framework should give additional credit to CRT as a source of capital and particularly the reinsurance execution of CRT:

- Reinsurers serve as a long-term source of capital for mortgage credit risk; and
- Reinsurers provide a check and balance for the underwriting quality of insured mortgages as they are less able to move in and out of positions after underwriting the policy.

The remainder of this response provides support and considerations for FHFA to incorporate into recognizing the amount and quality of capital provided to the Enterprises through CRT.

Introduction

FHFA is the regulator of Freddie Mac and Fannie Mae (together, "the Enterprises"). In September 2008, FHFA placed the Enterprises into conservatorship due to mounting actual and forecast credit losses, and the Enterprises have been in conservatorship since then. FHFA recently published a proposed capital rule for the Enterprises in advance of recapitalizing and releasing the Enterprises from conservatorship. In the proposed capital rule, FHFA requested comment and feedback on specific items related to the proposed rule. This response provides a primer on reinsurance capital and responses to FHFA's specific questions on the proposed capital framework.

Primer on reinsurance capital in the mortgage market

Reinsurance is a recognized source of capital and tool for capital management for various financial institutions.^{2,3} Reinsurance companies are sophisticated investors providing capital to diverse types of exposures (e.g., cyber security, life insurance, flood insurance, mortgage insurance, and others). Generally, when evaluating opportunities, reinsurance treaties are viewed with an expectation of some level of loss and an in-depth analysis is performed on what is known as the "probable maximum loss" (PML). This

¹ Zandi, M. et al. (July 2020). FHFA's Capital Rule is a Step Backward. Retrieved July 26, 2020, from <https://www.economy.com/economicview/analysis/380509/FHFAs-Capital-Rule-Is-a-Step-Backward>

² Comerford, E. et al. (June 2020). Reinsurance as a Capital Management Tool for Life Insurers. Milliman Research Report. Retrieved July 15, 2020, from <https://ie.milliman.com/en-gb/insight/Reinsurance-as-a-capital-management-tool-for-life-insurers>.

³ U.S. Department of the Treasury (December 2014). The Breadth and Scope of the Global Reinsurance Market and the Critical Role Such Market Plays in Supporting Insurance in the United States. Retrieved July 15, 2020, from <https://www.treasury.gov/initiatives/fio/reports-and-notice/Documents/FIO%20-%20Reinsurance%20Report.pdf>.

represents a reasonable expectation of the maximum loss for a given exposure. This metric is often used to allocate capital and estimate returns as a function of it, and the reinsurance industry devotes substantial resources to quantify tail risk and estimate adequate capital to pay future claims.

With respect to mortgage reinsurance transactions (including Freddie, Fannie, and private mortgage insurance transactions), the CRT market has placed over \$40 billion of reinsurance limit on mortgage credit risk exposures since 2013. This capital is a long-term commitment to the mortgage industry with transaction terms often extending 10 years or more. Unlike the capital markets, reinsurers are less able to quickly enter and exit transactions; therefore, the analysis at transaction underwriting evaluates the long-term exposure under baseline expectations, stress scenarios, and probability confidence levels. Furthermore, once reinsurance companies evaluate and begin to write business for a given exposure, the companies build and invest in the necessary tools, teams, and expertise to evaluate and monitor the exposure. In other words, they become experts in the field and analyze the exposures as long-term “through the cycle” market participants.

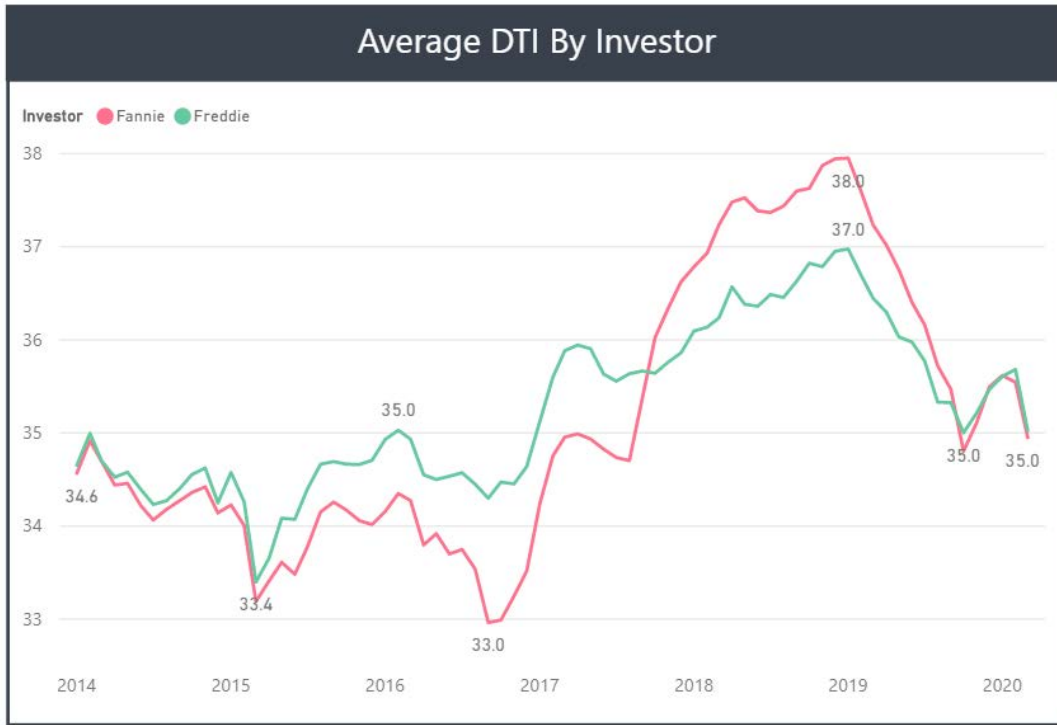
The current COVID-19 pandemic has highlighted this behavior and is a key differential between capital markets and reinsurance executions. A recent paper published by Milliman analyzes pricing differences and the volatility between capital markets bond spreads and reinsurance premiums for the CRT market.⁴ The paper finds more stability in the reinsurance market across economic periods relative to capital markets executions. In addition to price stability, the reinsurance market executed at least three private mortgage insurance transactions between March 2020 and June 2020, a period where capital markets pricing was not economical and credit risk transfer security issuance was placed on hold. In July and August of 2020, reinsurers also participated in CRT issuance from Freddie Mac. The fact that there has been transaction activity throughout the pandemic strengthens the argument that reinsurance capital is generally priced through the cycle and represents a long-term, committed source of capital.

Because reinsurers price the risk to be actuarially sound, the reinsurance industry serves as a check and balance on underwriting changes and guidelines from Freddie Mac and Fannie Mae. As an example, revised underwriting processes from the Enterprises in late 2017 resulted in increased debt-to-income (DTI) ratios for new originations, as shown in Figure 1. The mortgage insurance and reinsurance industry pushed back on the increases in DTI as increasing the risk profile of mortgages, and the underwriting guidelines and automated approval process was later refined, resulting in lower DTIs for subsequent originations.⁵

⁴ Schmitz, M.C., Glowacki, J.B., & Netter, A. (May 15, 2020). In It for the Long Haul: A Case for the Expanded Use of the GSEs' Reinsurance CRT Executions. Retrieved July 15, 2020, from <https://www.milliman.com/en/insight/In-it-for-the-long-haul-A-case-for-the-expanded-use-of-the-GSEs-reinsurance-CRT-executions>.

⁵ Ramirez, K. (March 2, 2018). Mortgage insurance companies push back against 50% DTI. HW. Retrieved July 15, 2020, from <https://www.housingwire.com/articles/42664-mortgage-insurance-companies-push-back-against-50-dti/>.

Figure 1: Average DTI for Fannie Mae and Freddie Mac Originations by Calendar Month



Source: Milliman M-PIRe⁶

Reinsurers have demonstrated an appetite for both single family and multifamily risk and provide a check / balance on the risk-taking activities of the GSE’s. Note, reinsurers have the option of alternative exposures to deploy capital. Therefore, if the risk profile for mortgage credit increases beyond an acceptable tolerance level, the reinsurers can deploy capital into other exposures. Other sources of non-equity capital, such as loan-level credit enhancement, are monoline insurance companies with fewer alternatives to deploy capital. Mortgage originators generally originate mortgages consistent with the underwriting guidelines of the Enterprises (i.e. if Freddie Mac or Fannie Mae will take the loan, they will originate the loan). Therefore, if the Enterprises change their underwriting guidelines, there are fewer checks and balances in the system without reinsurance participation.

Finally, the CRT market provides a mature and economical marketplace for this capital to be deployed in the housing market. A private-label security market would require significant levels of due diligence on each servicer and originator by the reinsurance companies, which is currently fulfilled by Freddie Mac and Fannie Mae through a tried and tested platform.

⁶ Milliman M-PIRe is a cloud-based mortgage analytics platform designed to evaluate mortgage opportunities for investors and reinsurance companies, including whole loan and structured securities / insurance.

Objectives of the response

The proposed capital treatment for CRT is overly punitive and does not recognize the above benefits of an active mortgage reinsurance market. While there is a capital benefit to CRT executions in terms of reduced capital requirements relative to a whole loan exposure, the capital benefit is repeatedly given haircuts and reduced to the extent that the cost of CRT will exceed the capital benefit. Under this scenario, the amount of CRT transactions and participation will likely decrease, and the housing market will no longer benefit from the advantages of an active market for CRT.

The responses to FHFA's questions in the next section of this response highlight areas where additional consideration should be made for the capital benefit of reinsurance and CRT transactions.

One item that is not included in the text below is the discussion of equity capital versus CRT to absorb unexpected losses. The proposed capital rule strongly prefers equity capital to absorb unexpected losses. Equity capital, it is argued, is the most efficient source of capital as equity capital can absorb credit losses, operational losses, and other unexpected losses not covered by CRT. While this is a valid argument to consider, one issue not discussed in the proposed capital rule is the amount and source of capital available to support the mortgage market from existing investors. Reinsurers, and other CRT participants, are a significant source of capital to support the housing market and lending. As mentioned above, reinsurance has placed over \$40 billion of mortgage limit since 2013.

Reinsurers can support this market because they are able evaluate the risk profile of each transaction, and the transactions are largely similar with respect to contractual rules and requirements. The CRT market has developed into an efficient method of transferring mortgage credit risk to a diversified pool of investors and reinsurers, which in addition to reducing unexpected losses for the Enterprises, also serves as a check and balance to underwriting changes. Without such a model or market for CRT securities, the reinsurance community would not be able to participate in or support the housing market with the same magnitude of capital. This is because many reinsurance companies, for conservatism and to protect policy holders, have restrictions on the amount of capital that can be invested in equities. Furthermore, equities are subject to market price risk (i.e., fluctuations in the stock market) and do not necessarily represent the intrinsic value of the underlying mortgage exposure, potentially making the investment less attractive and predictable for reinsurance companies.

Therefore, under the proposed capital rule and assumption that CRT transactions become less prevalent as a source of capital, the Enterprises would no longer have access to the capital currently provided by the reinsurance industry. Additionally, the level of transparency being provided to support the CRT market could decline, removing insight and independent reviews of the activities and underwriting changes within the Enterprises. To support the CRT market, the Enterprises have released significant amounts of data, analytics tools, and support to provide transparency into underwriting guidelines and risk management. Without the need to support a CRT market, this level of transparency would likely decrease. While equity capital may have the most flexibility in absorbing various *sources* of loss, there are other considerations in capital sources FHFA should look at in finalizing the proposed capital rule.

Response to FHFA questions

The sections below are Milliman’s responses to the specific questions asked in the proposed rule. The responses are ordered as they appear in the proposed rule.

Question 67: Is the 10 percent prudential floor on the risk weight for a retained CRT exposure appropriately calibrated?

The proposed framework includes multiple capital buffers and/or haircuts for CRT transactions that, when added together, reduce the capital benefit to below a level of economic reasonability. Specific to the 10% floor, the value is overly conservative and does not adjust with the economics of the transaction. As discussed below, we recommend FHFA remove the 10 percent prudential floor from the proposed capital framework.

For demonstrative purposes, assume a simple reinsurance transaction with two layers: a subordinate layer equal to 10% of the original unpaid balance that is fully reinsured (with the exception of a 5% retention) and a senior layer equal to 90% of the original unpaid balance that is retained by the Enterprises. Further assume the subordinate layer only amortizes due to paid losses, and all principal repayments are allocated to the senior layer until the tranche is fully paid off. Exhibit 1 provides a visual of the structure. For the senior tranche of this structure, the probability of economic loss is close to zero, based on the historical performance of the types of loans guaranteed by the Enterprises. As support for this probability, the table in Figure 2 provides estimates of loss rates using Milliman M-PIRe and historical actual loss rates from publicly available data as of May 2020 using a 2008 repeat as a severe stress event.

Figure 2: Loss Rate Estimate Ranges

Estimate	Data Source	Loss Rate
Milliman M-PIRe Baseline Scenario	www.millimanmpire.com	0.25%
Milliman M-PIRe 2008 Repeat*	www.millimanmpire.com	2.0%
Freddie Mac Single- Family Loan-Level Performance Data (2007 Originations)	http://www.freddiemac.com/fmac-resources/research/pdf/summary_statistics.pdf	4.2%
Fannie Mae Single- Family Loan-Level Performance Data (2007 Originations)	https://loanperformancedata.fanniemae.com/lppub-docs/FNMA_SF_Loan_Performance_Stat_Summary_Primary.pdf	3.6%

* Milliman M-PIRe results reflect increased underwriting standards for 2020 originations relative to the loan product mix observed in 2007. Changes in underwriting are the main difference between actual loss rate experience and modeled loss rate experience for a repeat of the same economic environment.

The Milliman M-PIRe loss rate estimates in Figure 2 are representative of recent 2020 Agency Credit Insurance Structure (ACIS) and Credit Insurance Risk Transfer (CIRT) transactions, with forecasts performed at transaction inception. Exhibit 2 provides a visual of the loss rates relative to the 10% subordinate tranche.

From Figure 2 and Exhibit 2, historical loss rates are highest for 2007 originations from Freddie Mac at 4.2%; the comparable loss rate for 2007 originations from Fannie Mae is 3.6%. The loan-level dataset published by Freddie Mac includes additional loans not included in the Fannie Mae data, most notably

Home Affordable Refinance Program (HARP) loans and other loans with a loan-to-value (LTV) above 97.⁷ Using the loan-level performance models in Milliman M-PIRe (which is estimated using the Freddie Mac and Fannie Mae data), we estimate a 2008 repeat economic scenario would result in a loss rate of approximately 200 basis points. For all stress loss rate indications in Figure 2, the loss rate is significantly lower than the 10% attachment point. Therefore, we would reasonably anticipate that all losses would be absorbed by the subordinate tranche, and no losses would accrue to the senior tranche, except for an economic scenario much more severe than a 2008 repeat scenario.

If the proposed capital framework is applied to this structure, the Enterprises would be required to hold capital of approximately 1.25% (low-LTV transaction) to 1.96% (high-LTV transaction) of the original UPB of the pool.⁸ These assumptions are based on Milliman M-PIRe expected loss estimates for a 2020 ACIS transaction, a 30% risk-weight for the mortgage collateral, a 7.5% counterparty haircut for loss sharing, and a 5% vertical retention by the Enterprises. Exhibit 3 provides a “waterfall” of the capital requirements for a low-LTV ACIS transaction for this sample structure. The exhibit is segmented into the following components:

1. Starting Required Capital

This represents the amount of capital required for the 5% retention on the subordinate tranche and the capital required for the 100% retained senior tranche without consideration for the loss timing adjustment, counterparty haircuts, the 10% senior tranche risk-weight, or the 10% overall effectiveness adjustment (OEA).

2. Loss Timing Adjustment

This step adds the loss timing adjustment in the proposed rule. For this transaction, the loss timing adjustment factor is assumed to be 93%.

3. Counterparty Haircuts

This step adds capital for counterparty haircuts. Counterparty haircuts include both the counterparty haircut for the underlying loans (i.e. private mortgage insurance or loan-level credit enhancement) and the counterparty haircut for loss sharing (i.e. default probability of the reinsurer).

4. 10% Senior Retention

This step adds capital for the 10% senior retention amount by adding a 10% risk-weight for the 90% senior retained portion of the transaction.

5. 10% OEA

This step adds the 10% factor for the overall effectiveness adjustment in the proposed capital rule.

⁷ Note, that Fannie Mae does publish performance data on HARP transactions, but this data is in a separate dataset and not included in the summary statistics used for Figure 2.

⁸ Milliman relied upon an edited version of the credit risk transfer tool published by FHFA to develop these estimates. The tool is available at <https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Publishes-Credit-Risk-Transfer-Tool.aspx>

Based on the above waterfall, the starting capital requirement is estimated at 0.12%, or 12 basis points, representing the 5% retention amount of the subordinate tranche. To benchmark this calculation against a stress loss scenario using the proposed rules' risk-weight methodology, the risk-weight for the collateral is assumed to be 30%. Applying an 8% capital requirement to this risk-weight results in a capital level of 2.4% ($2.4\% = 30\% * 8\%$) for the pool. This is the capital that would be required if the loans were held on the balance sheet and is generally consistent with the Milliman M-PIRe 2008 repeat scenario shown in Exhibit 1. Multiplying this amount by 5% for the retention portion of the tranche results in a required capital amount of 0.06% ($0.06\% = 2.4\% * 5\%$). The 0.12% shown in Exhibit 2 is more conservative relative to 0.06% because of various adjustments and tranche-level risk-weights applied in the structure.

Layering in the loss timing adjustment increases the required capital by 0.18% to 0.30%. Adding the counterparty haircut increases the capital requirement by 0.02% to 0.32%. This level of capital could be appropriate for the retained portion of the subordinate tranche and operational risks of the structure, as discussed in the proposed rule. However, the proposed rule would layer in two additional and significant capital requirements for the transaction: the senior retention amount and the "overall effectiveness adjustment" of the structure. In this example, the senior retention amount increases the required capital amount by 0.72%, from 0.32% to 1.04%, and the overall effectiveness adjustment increases the capital amount further to 1.25%. From the economics of the transaction, the entire credit risk of the collateral would be covered by the subordinate tranche, and there is virtually no probability of credit loss (expected or unexpected) to the senior tranche. Nevertheless, the proposed capital rule more than triples the capital required for this transaction for retaining the senior tranche of the sample structure (increasing the capital from 0.32% to 1.04%). We also note that, if the loans were retained, then the capital requirement would be 2.4%. Therefore, although for all intents and purposes 100% of the unexpected losses and need for a capital buffer would be transferred to the private market, the proposed rule only reduces the required capital by 52% ($52\% = 1.25 / 2.4$).

Exhibit 4 provides a similar waterfall sample using a high-LTV transaction. This exhibit results in a demonstration similar to the one presented in Exhibit 3—the 10% retention amount for the senior layer reduces the capital benefit of CRT to below a level of economic reasonability.

The 10% minimum risk-weight is overly conservative, and Milliman recommends FHFA remove the 10% risk-weight floor from the proposed rule. The proposed rule includes sufficient equity capital to absorb unexpected losses in excess of CRT without consideration of the 10% risk-weight floor.

If FHFA concludes there must be some level of capital on senior retained tranches, we propose a more dynamic approach to estimating capital requirements for these tranches that is based on the level of risk of the collateral. FHFA developed and calibrated a loan-level risk-weight approach to estimate capital requirements for whole loan mortgages retained by the Enterprises. FHFA could leverage this methodology to calculate an economic estimate on capital requirements and loss. Tranches with attachment points above a given multiple of the whole loan capital requirement could be assigned a lower (or no) capital requirement. For example, a table similar to Figure 3 could be relied upon to provide a more dynamic estimate of required capital (note, that the table in Figure 3 is for demonstrative purposes only—additional analytics based on historical performance data would be required to calibrate this table).

Figure 3: Tiered Risk-Weights for Senior Retained Tranches

	Multiple of Whole Loan Capital Requirement	Risk-Weight
A	1.0 - 1.5	10.0%
B	1.5 - 2.0	5.0%
C	2.0 - 2.5	2.5%
D	2.5 +	0.0%

Using the values in Exhibit 3, the table in Figure 4 provides a demonstration of the capital requirement for the representative structure discussed in this response:

Figure 4: Tiered Risk-Weight Application Example for Senior Retained Tranches

		Value	Calculation
A	Risk-Weight on Collateral	30%	From Proposed Rule
B	Capital Requirement	8%	From Proposed Rule
C	Whole Loan Capital Requirement	2.4%	$C = A * B$
D	Catastrophic Risk-Weight Range		
	2.4% – 3.6%	10%	From above table
	3.6% - 4.8%	5%	
	4.8% - 6.0%	2.5%	
	6.0% +	0%	
E	Risk-Weight for the Senior Tranche	0%	In this instance, the risk-weight for the senior tranche is 0% as the senior tranche attachment point is greater than 2.5 times the whole loan capital requirement.

For this sample transaction, the rest of the framework would still apply, and the required capital would be estimated at 0.53%. If the senior retained layer had a lower attachment point consistent with prior ACIS and CIRT transactions, the above framework would increase the capital requirement commensurate with the lower attachment point. The table in Figure 4 should be calibrated using historical data in such a way that the resulting capital requirements are commensurate with the risk retained.

This approach is similar to the concept of “probable maximum loss” (PML) used in reinsurance.⁹ Often times, reinsurance exposures, known as the Limit, exceed a reasonable maximum loss from the transactions. In order to efficiently allocate capital to their various exposures, reinsurance companies estimate a PML for capital allocation. This approach looks at the underlying exposures, applies a consistent methodology to estimate the loss, and allocates capital based on the maximum probable loss. This concept can be applied to CRT transactions, producing a reasonable estimate of capital required for senior retained tranches. Milliman can assist and provide more information on this recommendation upon request.

Question 70: Is the proposed approach to determining the credit risk capital requirement for retained CRT exposures appropriately formulated?

The proposed framework provides an uneconomical haircut for CRT capital. Using Exhibits 3 and 4 for illustrative purposes, the largest contributors to excess capital requirements are the counterparty risk-weights for loan-level credit enhancement (discussed in more detail in the response to Question 71 below), the 10% risk-weight requirement for retained layers (discussed in more detail in the response to Question 67 above), and the 10% OEA (discussed in more detail in the response to Question 73 below). Other adjustments and risk-weights in the proposed framework are conservative; this is supported by the 0.32% of required capital post-CRT transaction shown in Exhibit 3 before layering in these three adjustments and in recognition that the probability of credit losses in the sample transaction would be near 0% for the senior retained tranche. However, a 0.32% capital requirement on this structure is more reasonable relative to the 1.25% capital requirement from the proposed rule.

The responses to Questions 67, 71, and 73 highlight specific details of the proposed framework for additional consideration by FHFA. Where appropriate, alternative methodologies are proposed in this response.

Question 71: Are the adjustments for counterparty risk appropriately calibrated?

⁹ For more information see <https://www.casact.org/pubs/proceed/proceed83/83213.pdf>

There are two adjustments in the proposed rule for counterparty risk. The first is the counterparty risk-weight for loan-level credit enhancement, and the second is the counterparty risk-weight for a panel of insurers or reinsurers. The response in this section addresses the counterparty risk-weight for loan-level credit enhancement with respect to CRT.

The counterparty risk-weight for loan-level credit enhancement increases the required capital for a transaction with high-LTV loans (i.e., above 80 LTV). The parameter for the loan-level counterparty risk-weight is the aggregate credit risk-weighted assets due to counterparty default on loan-level credit enhancements (i.e., the risk that mortgage insurance payments are not collected on a claim). It is calculated as the difference between (i) whole loan risk-weighted assets, and (ii) aggregate credit risk-weighted assets associated with the underlying mortgage exposures where the counterparty haircut for loan-level credit enhancement is set to zero. Specifically, the proposed rule calculates the loan-level counterparty risk-weights as shown in the table in Figure 5¹⁰:

Figure 5: Loan-level Counterparty Risk-Weight Calculation Example

		Whole Loan Risk-Weighted Asset	Adjustment for Counterparty Risk	Counterparty Risk-Weighted Asset
		(i)	(ii)	
Assumed Risk-Weight	A	30%	30%	N/A
Credit Enhancement Multiplier	B	25%	25%	N/A
Counterparty Haircut	C	7.5%	0%	
Risk-Weighted Asset Formula	D	$A * (1 - (1-B) * (1-C))$	$A * B$	(i)-(ii)
Risk-Weighted Asset		9.75%	7.50%	2.25%

In effect, the above calculation passes the capital required under the proposed rule for loan-level counterparty risk to the CRT structure. The proposed rule allocates capital requirements by tranche for loan-level counterparty risk-weights using the following logic:

1. Calculate the counterparty risk-weighted assets

In Figure 5, that is 2.25%

2. Allocate this amount across the structure proportional to the size of the tranche

Using the two-tranche demonstration, the allocation would be 0.225% (10% * 2.25%) to the subordinate tranche and 2.025% (90% * 2.25%) to the senior tranche.

¹⁰ <https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Publishes-Credit-Risk-Transfer-Tool.aspx>

3. This amount is *additive* to the *Adjusted Exposure Amount*. Therefore, in addition to having a 10% risk-weight for the senior layer, the proposed rule further increases the required capital by requiring capital for non-payment of mortgage insurance to the senior tranche. This is visually demonstrated in Exhibit 4 under the waterfall step “Add Counterparty Haircuts.” From Exhibit 4, the counterparty capital requirement increases the required capital from 0.41% to 1.01%, and the 10% senior retention amount increases the required capital further from 1.01% to 1.73%.

As an alternative to the proposed allocation method, we suggest FHFA incorporate the risk of non-payment on loan-level credit enhancement by adding the counterparty risk-weight to the risk-weighted assets of the underlying loans. This approach is consistent with the fact that counterparty risk on loan-level credit enhancements is independent from CRT and exists on all loans that have loan-level credit enhancements regardless of whether they are in CRT or not.

Exhibit 5 provides an example of the results of this methodology using the same representative transaction and structure as the transaction in Exhibit 4. For Exhibit 5, the proposed methodology for allocating risk-weights to individual tranches was removed. Instead, the counterparty risk-weight was added to the aggregated risk-weighted assets of the collateral, and the counterparty risk-weight was allowed to “flow through” the proposed capital rule. For demonstration purposes, assume the risk-weight for the collateral was calculated as 30% of the original UPB of the mortgages. If the counterparty risk-weight was calculated at 2.25%, a value of 32.25% was input for the risk-weights of the collateral for this step of the capital waterfall.

This approach leverages the existing proposed rule but re-allocates the capital required for counterparty risk-weights. This methodology increases required capital by 0.22% relative to the 0.60% under the proposed methodology.

Question 72: Are the adjustments for loss-timing and other maturity-related risk appropriately calibrated?

The response to this question relates to the Adjusted Exposure Amount. The Adjusted Exposure Amount is calculated in a manner that can result in *greater* capital amounts with *higher* attachment points for senior retained tranches. In other words, if more risk is transferred to the private market, the Enterprise may be required to hold more capital relative to structures where less risk is transferred to the private market.

This occurs when the weighted-average requirement of the underlying collateral (K_A) adjusted for the Loss Timing Effectiveness ($LTK_{A,LS}$) exceeds the attachment point. This section provides a demonstration of the observation. For this analysis, we used the following assumptions:

- $K_A = 2.75\%$;
- $LTK_{A,LS} = 2.54\%$; and
- Subordinate tranche layer varies from 0.0% to 5.0% in increments of 0.50%.

Exhibit 6 provides a visual of the resulting post-CRT risk-weighted asset for the subordinate tranche by varying the attachment size of the subordinate tranche from 0.0% (i.e. no CRT) to 5.0% in the blue bars. From the exhibit, the capital requirement increases as the subordinate tranche size *increases* from 2.5% to 3.0%. The increase is a function of the Loss Timing Effectiveness adjustment and 10% minimum capital requirement for the senior retained tranche. If the 10% minimum capital requirement is removed, then this observation does not occur. However, with the floor, as the attachment and detachment points for tranches move in relation to the expected and stress loss, the proposed framework can result in increases in post-CRT capital requirements even though the retained risk is reduced.

To correct for this in the proposed framework, Milliman recommends FHFA removed the 10% minimum risk-weight for senior retained tranches. The comparable post-CRT benefit is shown in the grey bars on the exhibit.

Question 73: Is the 10 percent adjustment for the general effectiveness of CRT appropriately calibrated?

The proposed 10% adjustment for the general effectiveness of CRT is redundant and results in uneconomical capital requirements for CRT transactions. Many aspects of the proposed capital rule are conservative with respect to capital requirements for CRT transactions. Additionally, as discussed in the Introduction section of this response above, there are benefits to an active CRT market that should be encouraged by FHFA. Specifically, a functioning CRT market requires a healthy amount of transparency on both the loans that collateralize the transaction and the general underwriting and on business practices of the Enterprises. As CRT reinsurance participants' interests are directly aligned with the Enterprises, the CRT market participants serve as a check and balance to potential loosening underwriting trends. Such benefits do not appear to be considered in the proposed framework.

In addition to the benefits of an active CRT market, the proposed capital rule includes operational effectiveness requirements that reduce the need for a 10% adjustment for the general effectiveness of CRT. Specifically, the proposed rules require:

1. The CRT is of a category of CRT structures that has been approved by FHFA as effective in transferring credit risk.
2. The terms and conditions in the CRT do not include provisions that might undermine the effectiveness of the transfer of the credit risk.
3. Clean-up calls relating to the CRT are limited to specified circumstances.
4. The Enterprises publicly disclose the material recourse or other risks that might reduce the effectiveness of the CRT in transferring credit risk.
5. Each operational criterion for a traditional securitization or a synthetic securitization that is not satisfied by the CRT and the reasons that each such condition is not satisfied.

As each CRT structure must be approved by FHFA, FHFA has the ability to monitor structural features and changes over time. If needed, additional capital requirements can be placed on a per transaction basis for operational effectiveness, but a standard 10% haircut is not supported by data or empirical analysis. Finally, the proposed capital framework is theoretically a long-term capital requirement that will govern capital levels for the Enterprises for the foreseeable future. Applying adjustments such as the 10% overall effectiveness adjustment (OEA) potentially reduces the credibility and reliability of the proposed capital framework.

Question 74: Is the 10 percent adjustment for the general effectiveness of CRT appropriate in light of the proposed rule's prudential floor on the risk weight for retained CRT exposures?

Previously in this response, we recommended removing the prudential floor on the risk weight for senior retained CRT exposures. Assuming the prudential floor is removed, the proposed rule still includes multiple levels of conservatism for many aspects of CRT transactions. An adjustment for the effectiveness of a given CRT transaction can be incorporated and supported into the capital framework, but the effectiveness adjustment should vary with the terms of the transaction and be set upon review and approval by FHFA for specific shortcomings on individual transactions.

Further, while one criticism of CRT transactions and their effectiveness as sources of capital can be that the market for new issuance disappears or is prohibitively expensive during periods of economic stress, this criticism did not hold during the current pandemic for the reinsurance market. Between March 2020 and June 2020, the reinsurance market has executed at least three mortgage reinsurance transactions with private mortgage insurance companies, providing a reliable source of capital during a period of great uncertainty. In July and August of 2020, reinsurers also participated in CRT issuance from Freddie Mac.

As discussed in the Introduction to this response above, reinsurance participants have invested significant resources to understanding mortgage credit risk, and tools to evaluate the data, and they are generally unable to enter and exit transactions over a short time frame. In other words, reinsurance capital represents a source of long-term capital that is committed to the exposure. When policies are underwritten, there is an expectation of loss on the transaction.

Finally, the proposed capital rule will increase the amount of equity capital held by the Enterprises. As the Enterprises transfer interest rate risk and market risk to third parties, capital for the Enterprises is generally retained for credit risk and operational risk. With an active CRT market, the Enterprises are able to manage credit risk, so the capital that is retained by the Enterprises is largely available for operation risks and credit risk net of mortgage insurance and CRT. The proposed minimum capital levels and buffers are much greater than the economic amount of the retained risk and are more than sufficient to cover any operational risks in CRT. An explicit 10% adjustment for operation risk on CRT is redundant under the proposed framework.

Milliman suggests FHFA remove the operational effectiveness adjustment from the proposed framework. Any haircut for operational deficiencies should be justified and supported by specific shortcomings on individual transactions.

Question 75: Should FHFA impose any restrictions on the collateral eligible to secure CRT that pose counterparty risk?

The insurance and reinsurance markets are heavily regulated markets, and (re)insurance companies themselves are conservative in the types of collateral placed in trusts for collateralized reinsurance agreements. This conservatism applies to both the ceding company and the assuming company. Each party is entering the reinsurance transaction to optimize its use of capital, and the capital is meant to be exposed to underwriting risk. To the extent possible, insurers and reinsurers try to minimize asset risk on reinsurance transactions, or the risk the collateral available to pay claims deteriorates due to changes in market prices.

For collateralized reinsurance agreements, the treaty typically details the amount of collateral required to be held in a trust account and how that capital can be released over time, based on actual claims and reserve development. Additionally, the treaties often provide a schedule of acceptable collateral and haircuts for the collateral, where the haircuts vary by the quality of the assets and duration of the assets. For this reason, most collateralized reinsurance transactions are supported by highly rated collateral with minimum price risk (e.g., U.S. Treasuries). Therefore, the reinsurance companies' interests are aligned to support collateralized reinsurance treaties with high quality collateral. To-date, most, if not all, reinsurance CRT transactions place restrictions on the type of eligible collateral used to collateralize the transactions.

Finally, many reinsurance companies active in CRT are domiciled in Bermuda, and the Bermuda Monetary Authority (i.e. the regulating entity of reinsurers) is currently evaluating collateralized reinsurance requirements. A consultation paper on the topic was published in October of 2019¹¹. As the use of collateralized reinsurance increases, the Bermuda Monetary Authority wants to ensure the treaties have the necessary support of and protection for policyholders.

Milliman suggests FHFA review the consultation paper produced by the Bermuda Monetary Authority to understand considerations and future regulations for reinsurance companies with respect to collateralized reinsurance agreements. Additionally, FHFA can review and comment on the collateral requirements from Freddie Mac and Fannie Mae for CRT transactions to minimize counterparty risk; however, Milliman does not believe additional collateralization restrictions are necessary from FHFA. Such restrictions could result in inconsistent regulations with other regulatory bodies and cause potential confusion or complexity within the market.

Conclusion

Milliman recognizes the significant efforts of FHFA in developing the proposed capital rule. The rule is comprehensive and contains various aspects of regulating large and systemically important market participants in the housing market.

With respect to CRT transactions, Milliman agrees with the general framework proposed by FHFA. However, there are three aspects of the proposed capital framework that result in uneconomical capital charges for CRT transactions. Milliman respectfully requests FHFA:

1. Remove the 10% risk-weight for senior retained tranches.
2. Adjust the methodology for allocating counterparty risk-weights for loan-level credit enhancement.
3. Remove the 10% overall effectiveness adjustment.

This response details the reasoning and support for a revision of these aspects of the capital framework for CRT transactions, using a sample structure whereby the entirety of the credit risk of a pool of mortgages is transferred to the private market.

In finalizing the treatment of CRT in the capital framework, FHFA should fully evaluate and consider the benefits of an active capital markets and reinsurance market for mortgage credit risk. As discussed in this response:

1. Reinsurers provide an independent viewpoint of risk and have demonstrated the ability to price and provide capital through economic cycles.
2. Reinsurers provide a large, dedicated capital base, which if accounted for properly can lower the cost of capital for Freddie Mac and Fannie Mae.
3. Reinsurers have demonstrated an appetite for both single family and multifamily risk and provide a check and balance on the risk-taking activities of the Enterprises.
4. The Enterprises provide an economical way for this capital to be deployed in the housing market.

The proposed capital framework does not recognize the above benefits of CRT and is overly conservative relative to the risk reduction provided by the transactions.

¹¹ Bermuda Monetary Authority (October 31, 2019). Collateralized Insurers Accounts, Returns, and Solvency Rules 2019. Consultation Paper. Retrieved July 16, 2020, from <https://www.bma.bm/viewPDF/documents/2019-10-31-13-25-22-CP-Collateralized-Insurers-Accounts>Returns-and-Solvency-Rules.pdf>.

About Milliman

For more than 70 years, Milliman has pioneered strategies, tools and solutions worldwide. As one of the largest consulting and actuarial firms in the world, we are recognized leaders in the markets we serve. Milliman insight reaches across global boundaries, offering specialized consulting services in employee benefits, healthcare, life insurance and financial services, and property and casualty insurance. Within these specialties, Milliman consultants serve a wide range of current and emerging markets. Clients know they can depend on us as industry experts, trusted advisors, and creative problem solvers.

We serve a full spectrum of business, financial, government, union, education, and nonprofit organizations. In addition to our consulting actuaries, Milliman's body of professionals includes numerous other specialists, ranging from clinicians to economists.

We serve our clients to protect the health and financial well-being of people everywhere. One part of this mission is to provide our clients with analytic tools and consulting services that assist them in developing and maintaining an affordable and sustainable housing system both domestically in the United States and internationally. Our analytic tools and consulting services help clients with two key aspects to achieve this goal: ensuring they hold adequate capital to maintain the availability of credit through economic cycles and ensuring mortgage credit risk is priced commensurate with the risk, i.e. that the prices are actuarially sound. By actuarially sound, we mean the credit risk charge is reasonable and not excessive, and the expected value of the risk premium is sufficient to cover expected losses and expenses plus a reasonable rate of return.

Recent work by Milliman in providing such consulting services include:

- Assisting the National Association of Insurance Commissioners ("NAIC") in developing a countercyclical and risk-based capital framework for the mortgage insurance industry;
- Providing actuarial services to the Federal Housing Administration;
- Providing actuarial services to State Housing Finance Agencies with mortgage insurance funds;
- Providing actuarial services to various mortgage insurance companies; and
- Licensing Milliman M-PIRe to various participants providing capital or otherwise engaged in the CRT market.

For the last item on the above list, Milliman developed a web-based mortgage analytics tool, the Mortgage Platform for Investments and Reinsurance, or M-PIRe, which is a turnkey solution to analyzing mortgage investment opportunities, including credit risk transfer. The platform includes the data, models (loan-level performance models and cash flow waterfalls), business intelligence dashboards, and other reporting tools to holistically manage and value a portfolio of mortgage exposures. The platform is updated monthly with revised economic information and mortgage performance data for the \$1.3 trillion (5.7 million by loan count) of original unpaid principal balance (UPB) underlying the CRT market. Milliman relied upon and extracted analytics from Milliman M-PIRe for analysis presented in this response. Among Milliman's core clients for the platform are various reinsurance companies. These companies are committed sources of long-term capital to the mortgage market.

Submitted by:

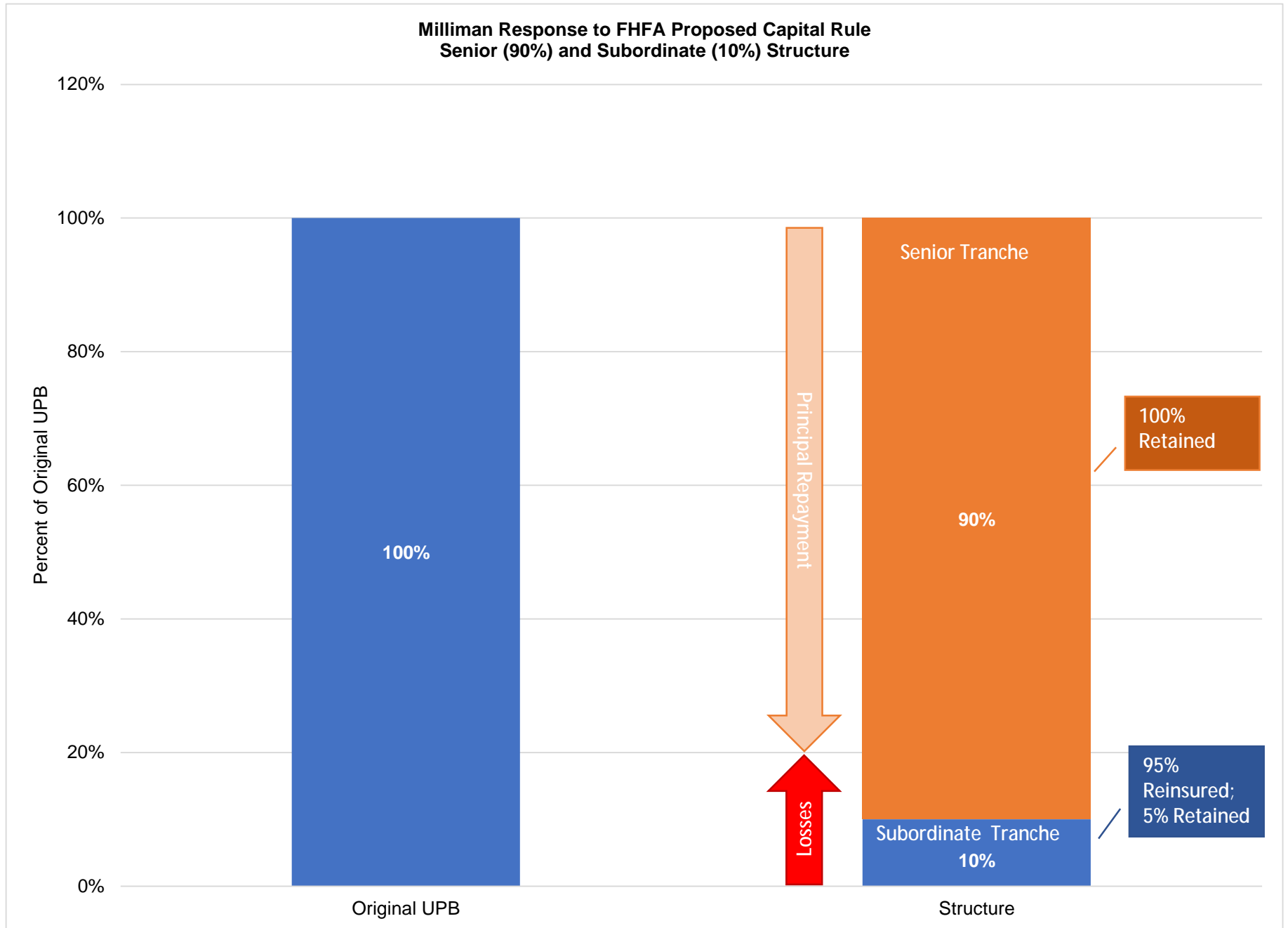
Jonathan B. Glowacki, FSA CERA MAAA
Principal and Consulting Actuary

Kenneth A. Bjurstrom
Principal and Financial Consultant

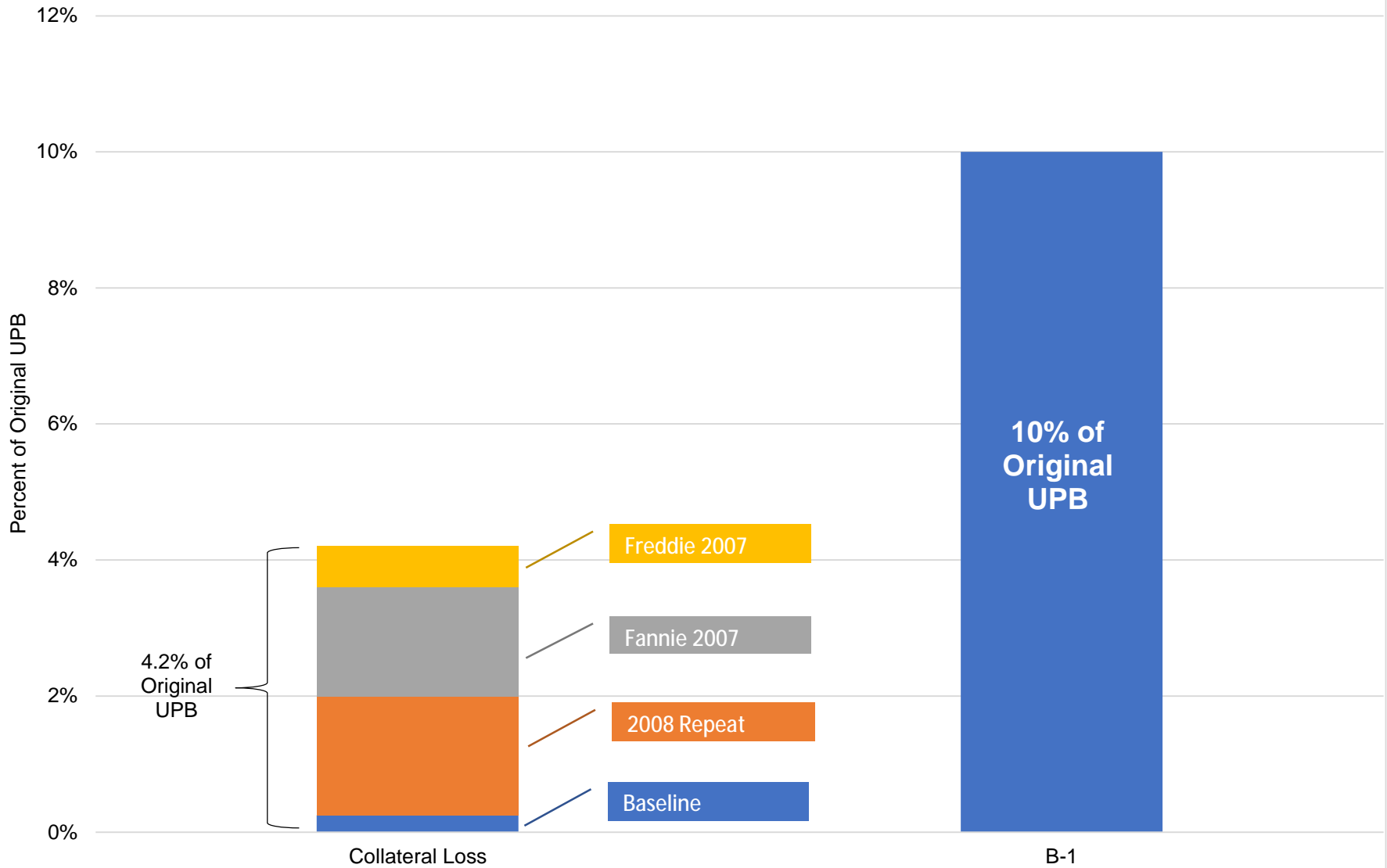
Andrew Netter
Senior Financial Consultant

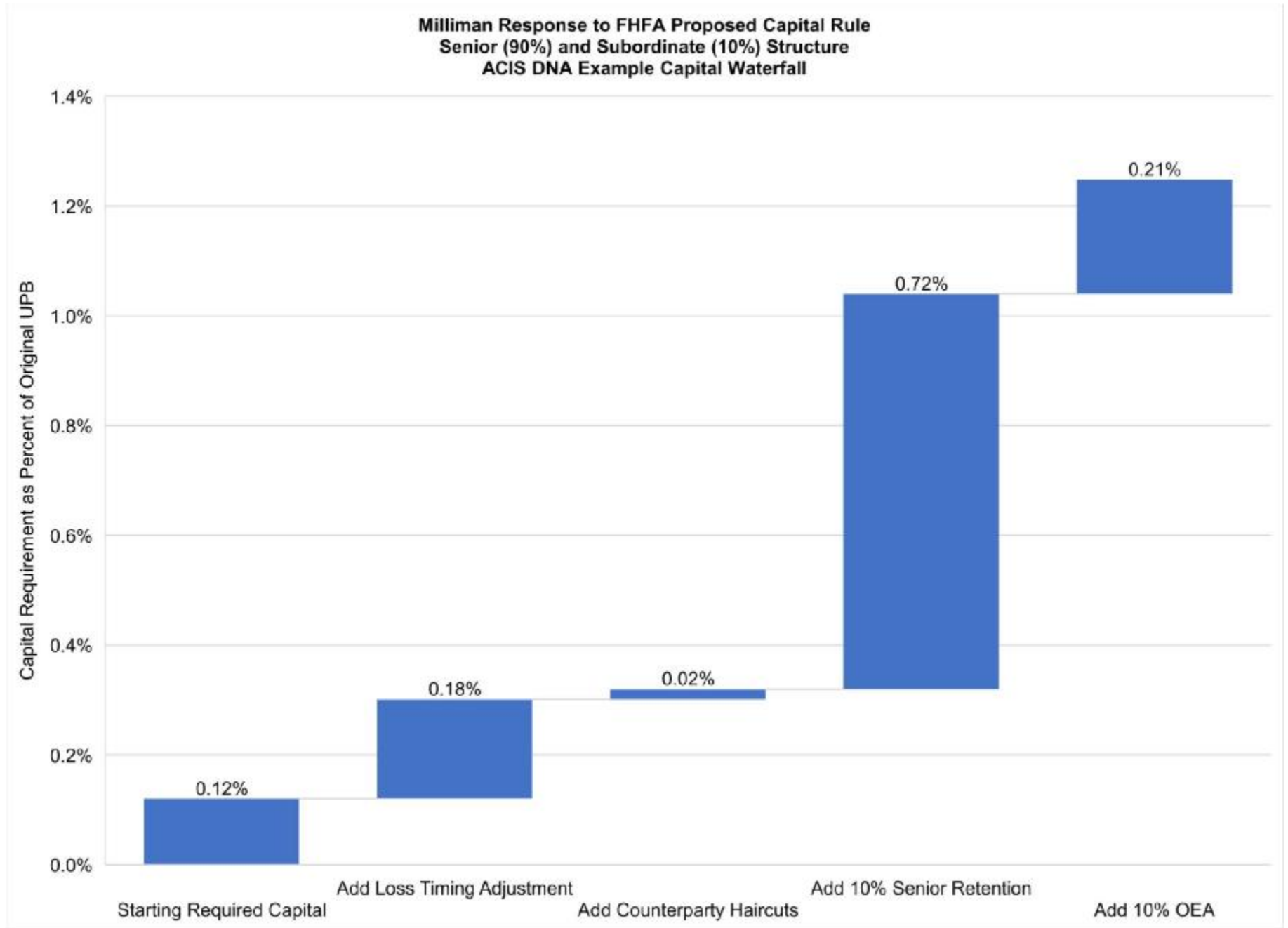
Michael C. Schmitz, FCAS, MAAA
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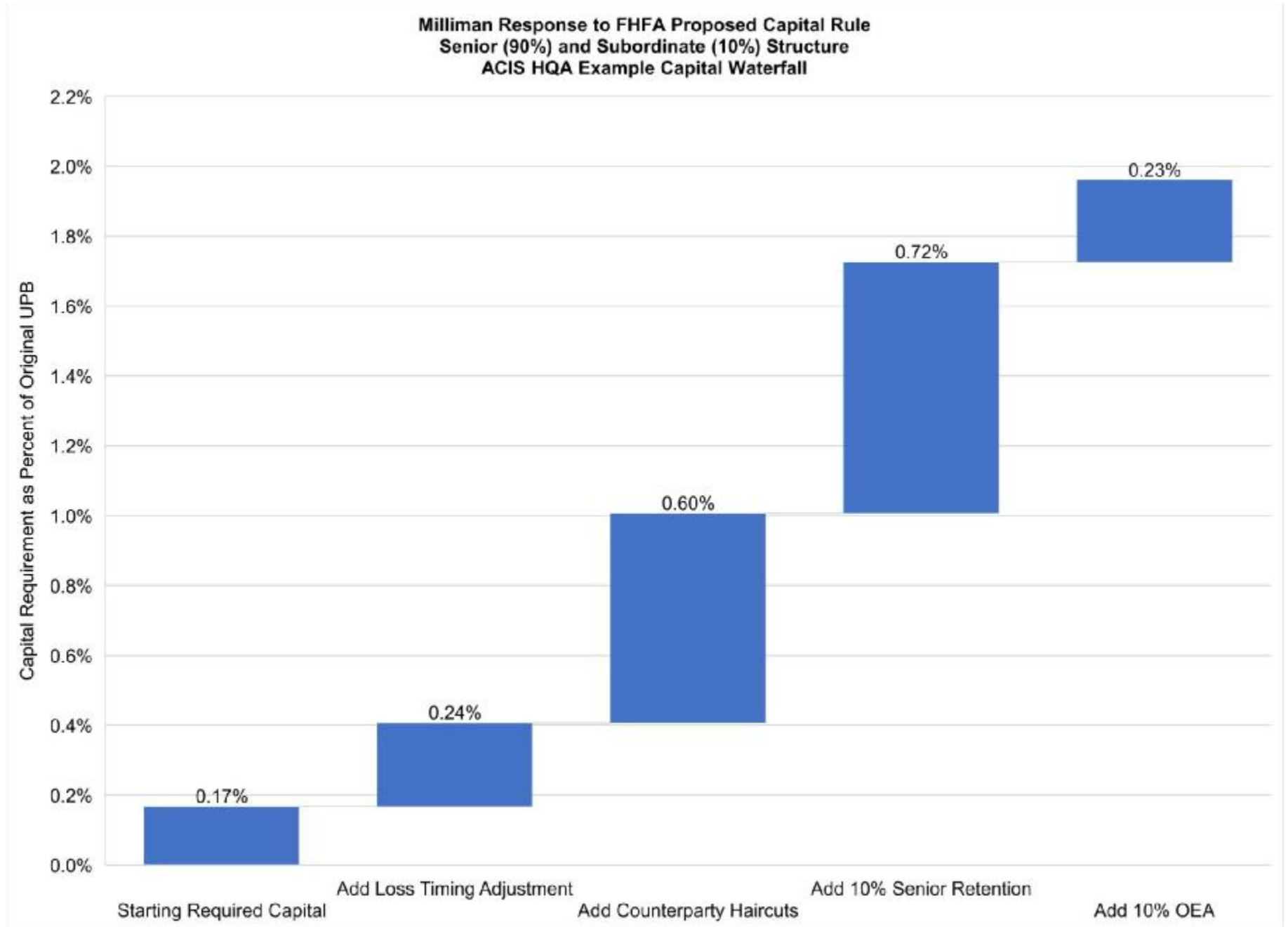
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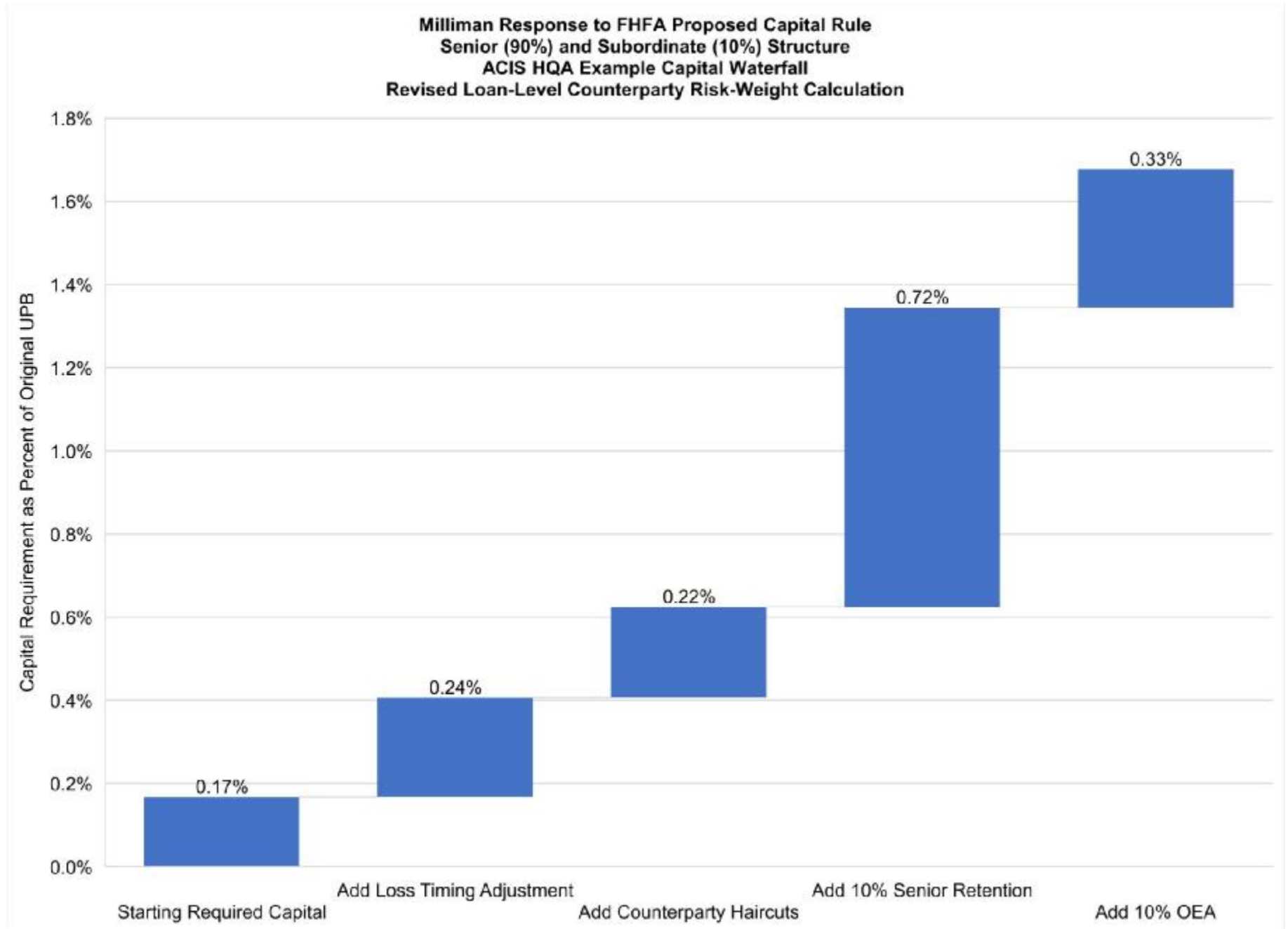


**Milliman Response to FHFA Proposed Capital Rule
Senior (90%) and Subordinate (10%) Structure
Collateral Loss Relative to Subordinate Tranche**

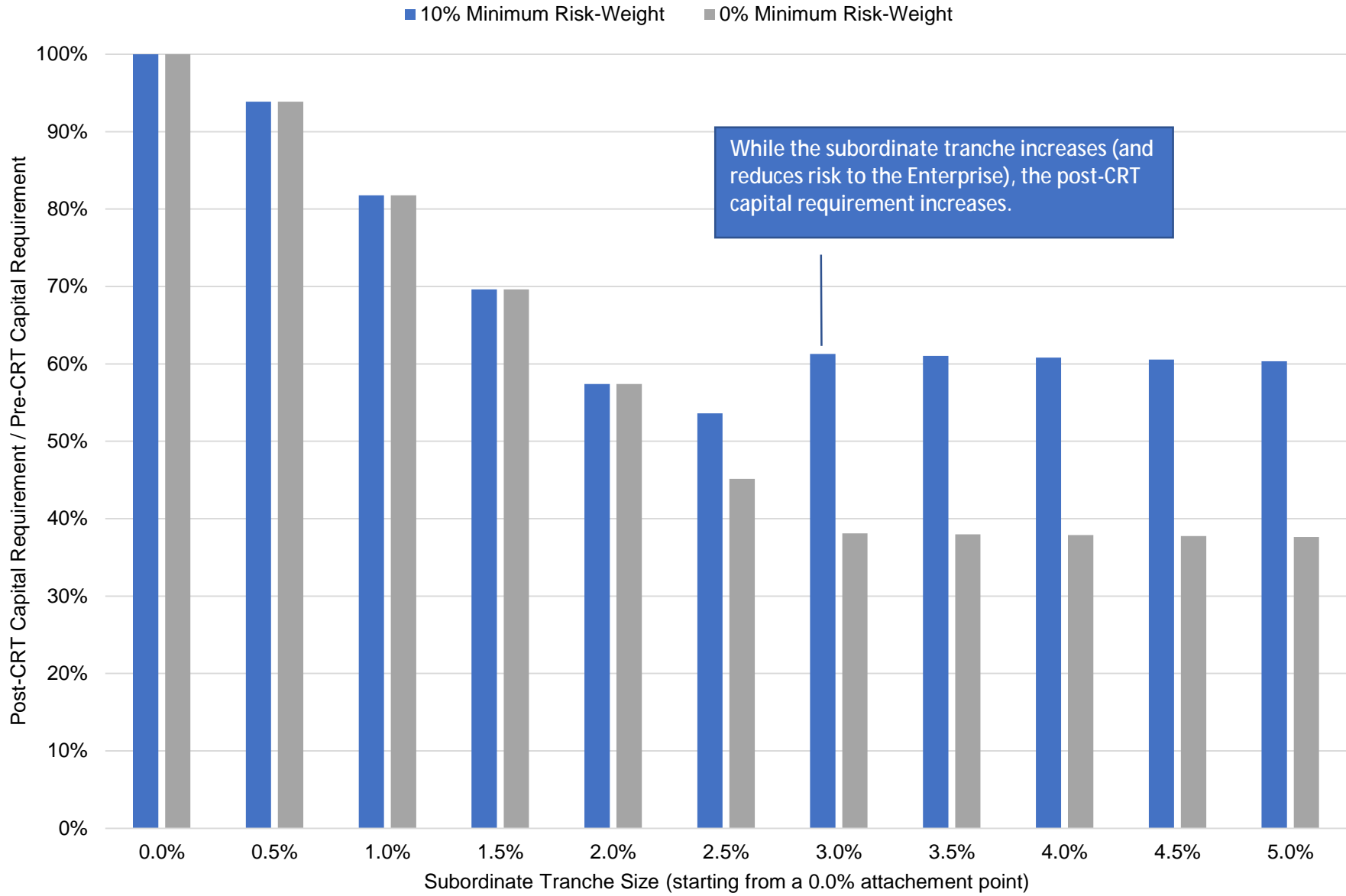








Milliman Response to FHFA Proposed Capital Rule Post-CRT Capital Requirement as a Function of Senior Attachment Point



While the subordinate tranche increases (and reduces risk to the Enterprise), the post-CRT capital requirement increases.