GuyCarpenter

Mortgage Credit Risk Transfer – The Reinsurance Market

Jonathan Berenbom, FCAS, MAAA
Managing Director, Guy Carpenter

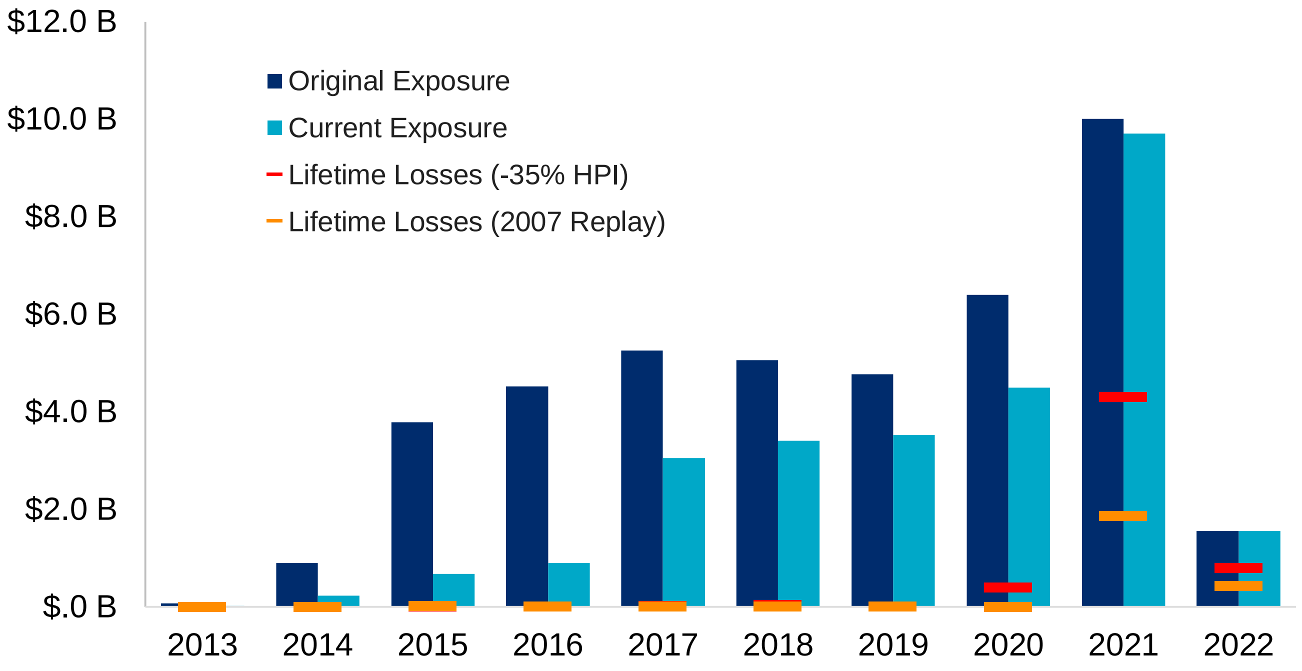
CAS Spring Meeting
May 17, 2022

A business of Marsh McLennan

Discussion Topics

- Impact of Home Price Growth on Reinsurer Portfolios
- Primary Mortgage Insurer Demand for Reinsurance
- Additional Impact of FHFA Regulatory Changes

Reinsurer Capacity Freeing Up as Older Vintages Season



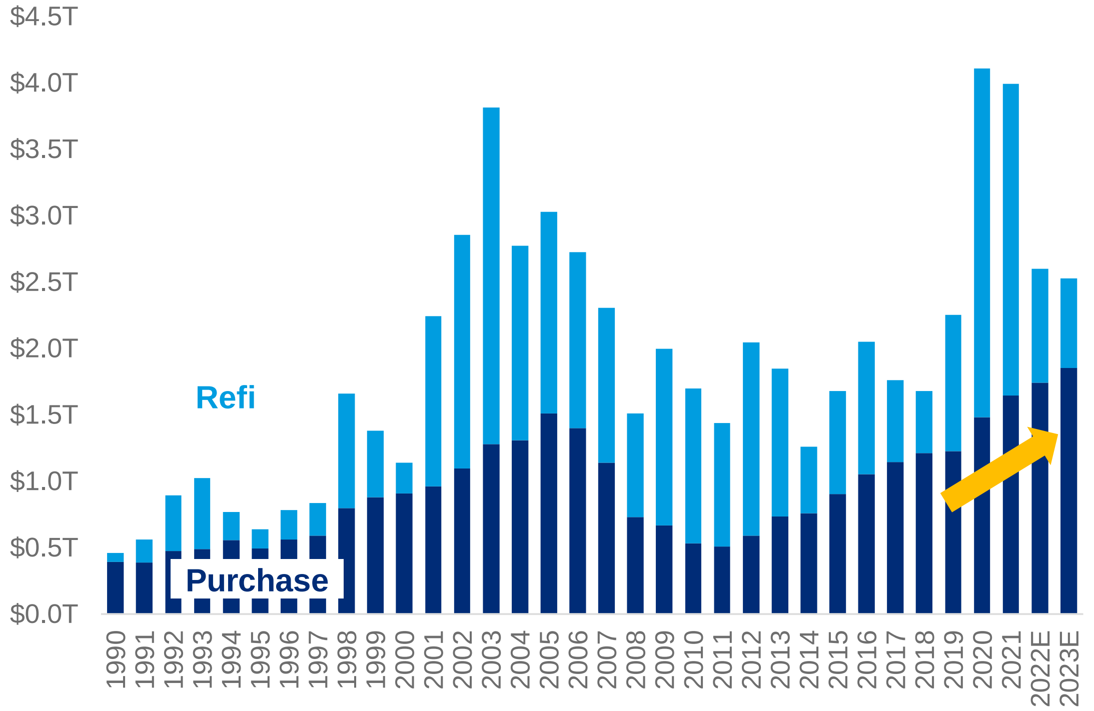
Notes: Modeled scenarios are based on M-PIRe modeling as of March 2022, assuming an economic call

Vintage	Original Limit	Remaining Limit	Ultmate Losses (-35% HPI)	Ultimate Losses (2007 Replay)
2013	$.1 B	$.0 B	$.0 B	$.0 B
2014	$.9 B	$.2 B	$.0 B	$.0 B
2015	$3.8 B	$.7 B	$.0 B	$.0 B
2016	$4.5 B	$.9 B	$.0 B	$.0 B
2017	$5.3 B	$3.1 B	$.0 B	$.0 B
2018	$5.1 B	$3.4 B	$.0 B	$.0 B
2019	$4.8 B	$3.5 B	$.0 B	$.0 B
2020	$6.4 B	$4.5 B	$.4 B	$.0 B
2021	$10.0 B	$9.7 B	$4.3 B	$1.9 B
2022	$1.6 B	$1.6 B	$.8 B	$.4 B
Total	**$42.3 B**	**$27.6 B**	**$5.6 B**	**$2.3 B**

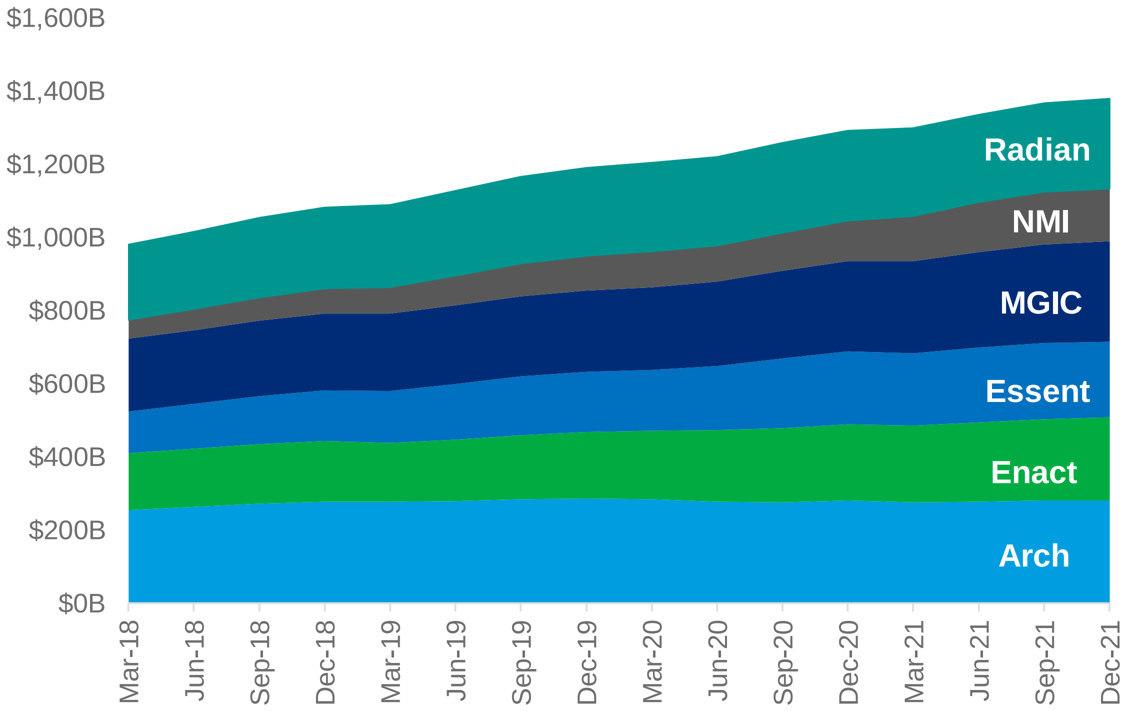
- Reinsurers GSE CRT portfolios have materially de-risked, as 35% of limit has runoff since program inception
- ULR of -35% HPI is 88% and the 2007 Stress Replay is 35%, underscoring historical profitability of temporally diversified participation
- All vintages 2019 and prior have virtually no expected losses in both severe stress scenarios

Positive Backdrop for MIs to Continue Growth

Record Purchase Mortgage Originations to Support MI Growth



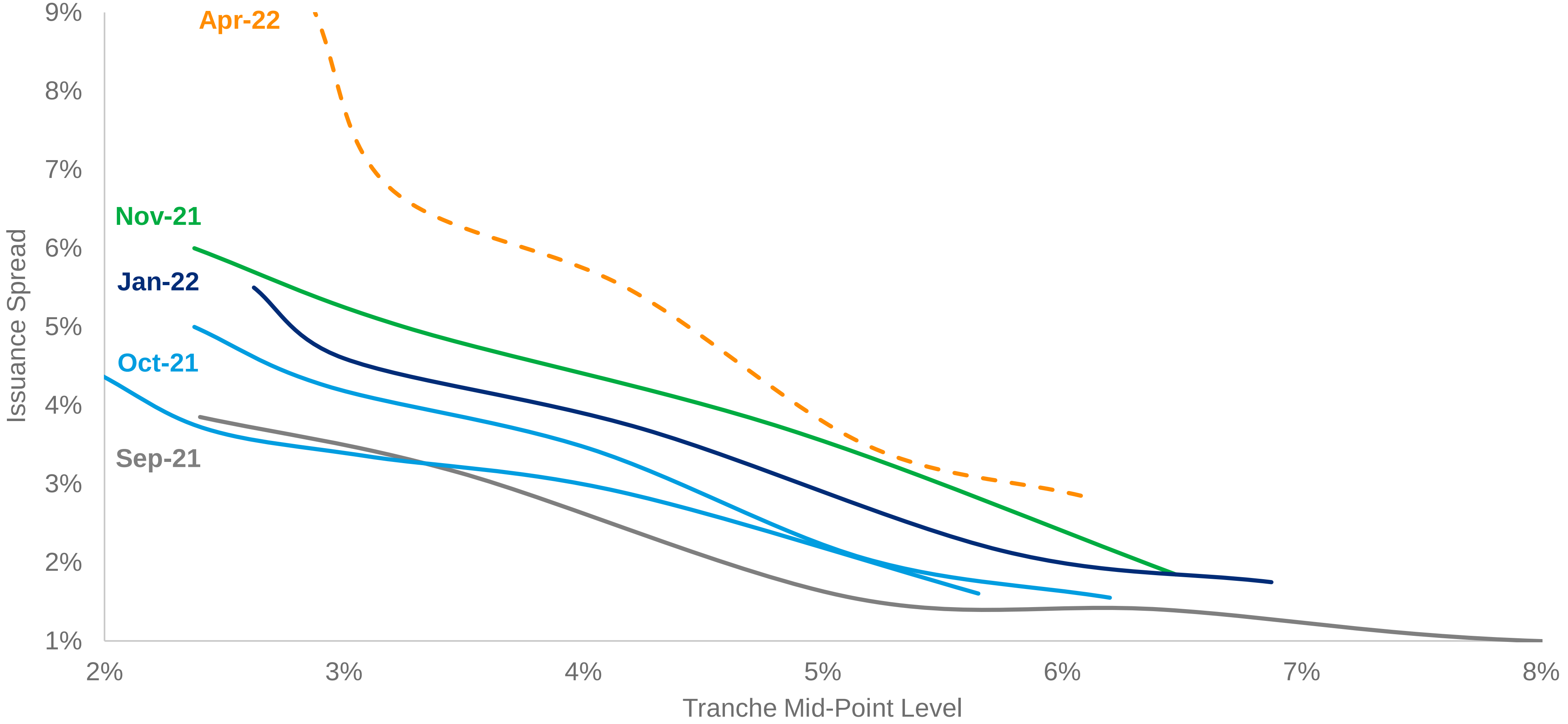
MI Insurance In Force Continues to Increase



- Historically high mortgage originations have supported MI growth, with IIF up nearly 30% from 3 years ago
- MBA forecasts purchase mortgage originations to continue to increase through 2023, with materially lower refinance volume
- High purchase originations + low refinancing = MI growth

Source: Mortgage Bankers Association, MI Company Filings

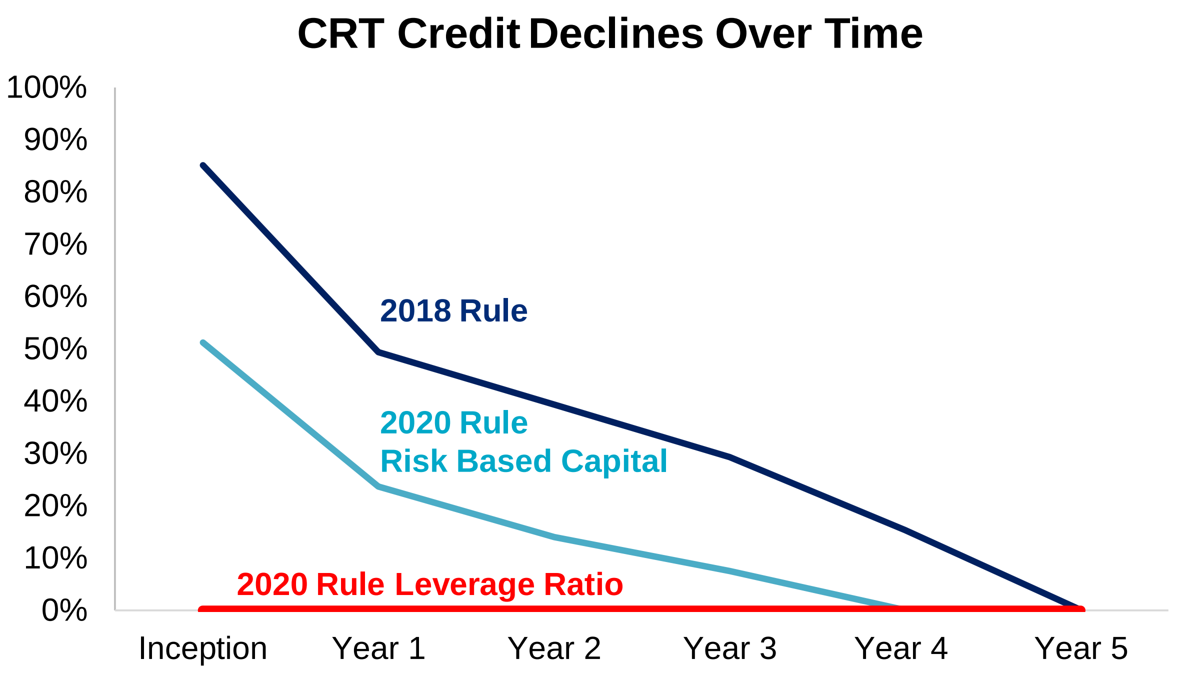
MI Insurance Linked Notes Rates Increasing



Rising ILN Spreads Increase Attractiveness of Traditional Reinsurance

Source: MI Company Filings, Bloomberg

2020 FHFA Capital Rule Disincentivized CRT



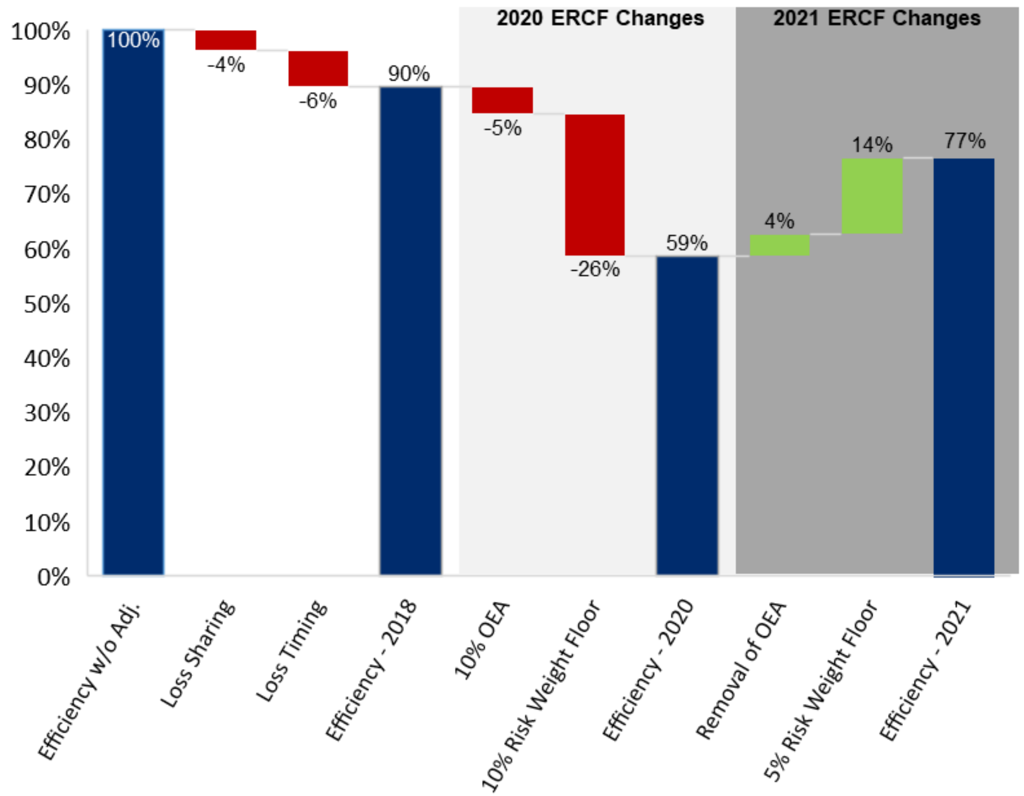
- The Federal Housing Finance Agency (FHFA) finalized a new Enterprise Regulatory Capital Framework (ERCF) in November 2020, causing significant reductions in CRT risk-based capital benefit
- CRT capital credit declined rapidly under the ERCF, increasing cost of capital to uneconomic levels
- After a June 2021 change in leadership at the FHFA, amendments to the ERCF increased the capital credit, but not to pre-2020 amounts
- ERCF amendments were sufficient for Fannie Mae to resume issuing CRT in late 2021.

Notes: CRT Credit = Capital Benefit from CRT / Remaining CRT Limit
Assumed 5% Annual Home Price Appreciation, 15% Annual Prepayments, 1 bp Annual Paid Losses

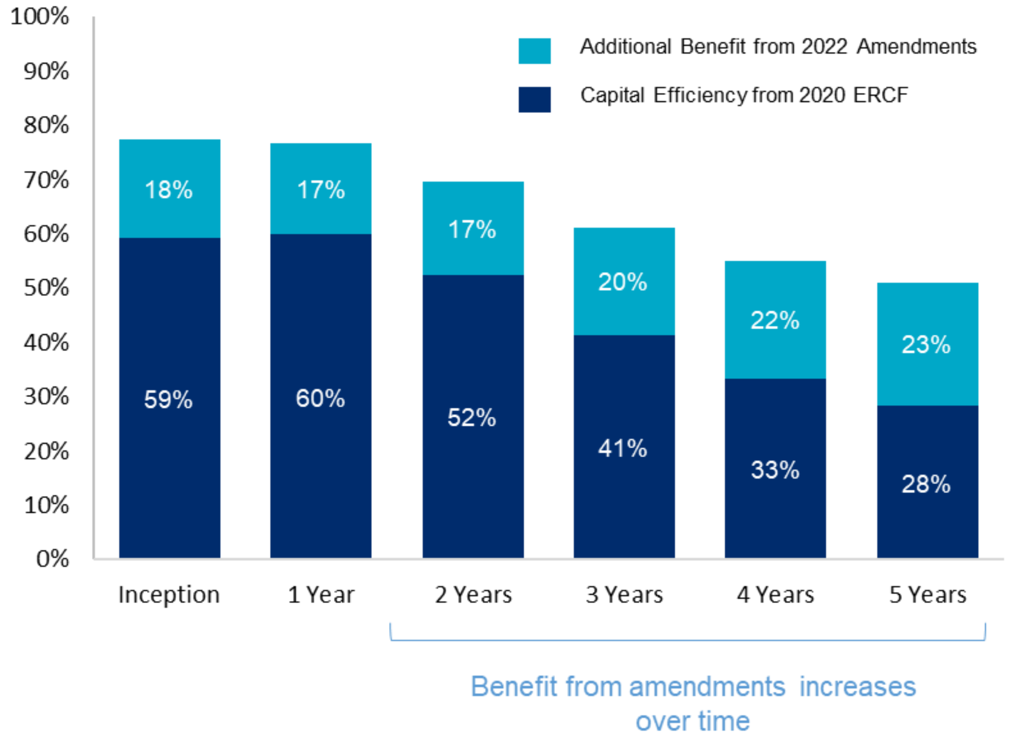
Source: GC Analytics

2022 ERCF Amendments Improved CRT Efficiency

CRT Efficiency Adjustments Under ERCF



CRT Capital Efficiency Erodes Quickly Under ERCF



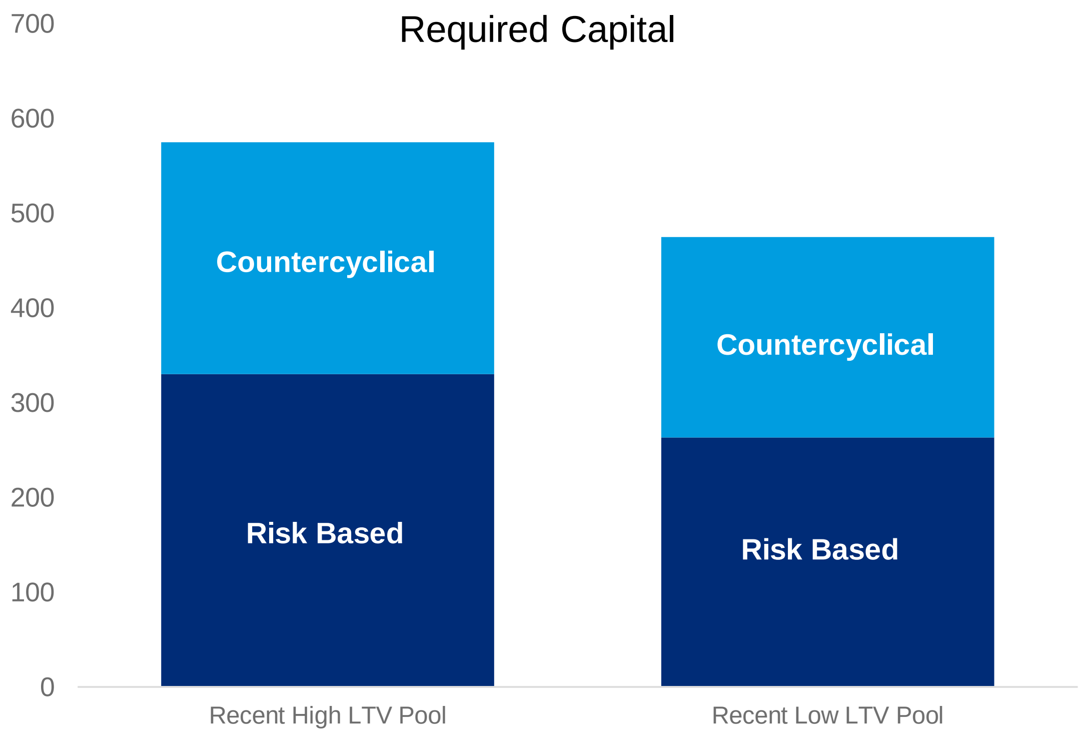
Source: GC Analytics modeled results
Assumptions: CIRT 2020-1 pool and structure, 300bps RBC at inception, 3% Annual HPI, 10% Annual CPR, 1% of Loans DQ at all times, 35bps expected loss, 1bp of annual paid losses

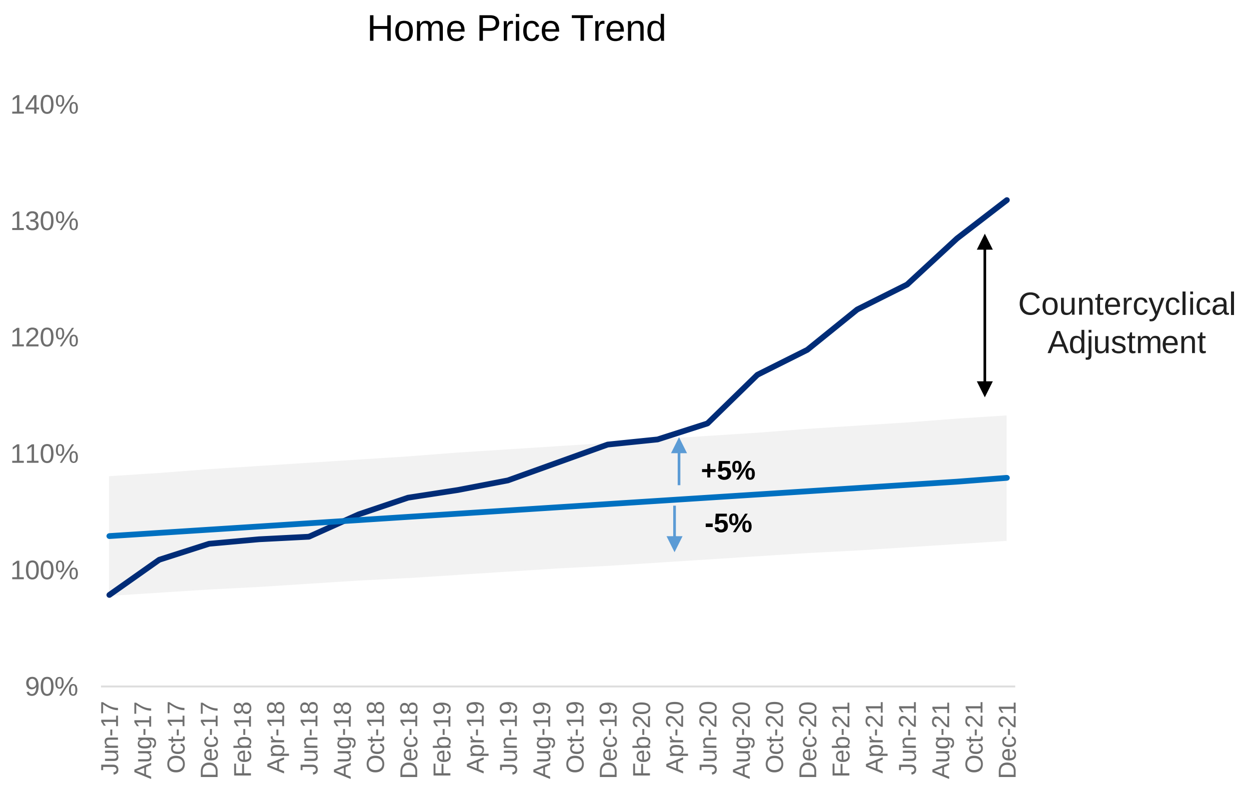
GuyCarpenter

Countercyclical Adjustment Adding Required Capital

CCA Increases Required Capital by 75%

Current HPA Well Outside Corridor





Source: Guy Carpenter Analytics., FHFA

Countercyclical Adjustment Adding Required Capital

Current CCA adds approximately 16% to LTV

	Adjusted MTMLTV													
Credit Score	<= 30	>30, <=40	>40, <=50	>50, <=60	>60, <=70	>70, <=75	>75, <=80	>80, <=85	>85, <=90	>90, <=95	>95, <=100	>100, <=110	>110, <=120	> 120
<620	2%	10%	18%	34%	49%	72%	105%	129%	159%	188%	218%	247%	275%	317%
620 - 639	2%	8%	14%	27%	39%	58%	84%	102%	127%	151%	178%	208%	237%	282%
640 - 659	2%	7%	12%	23%	34%	51%	73%	89%	111%	133%	159%	186%	214%	258%
660 - 679	2%	6%	10%	20%	29%	44%	63%	78%	98%	119%	141%	168%	194%	236%
680 - 699	2%	6%	9%	18%	26%	38%	55%	67%	88%	109%	125%	150%	176%	215%
700 - 719	2%	5%	8%	15%	22%	33%	47%	57%	75%	94%	110%	134%	158%	194%
720 - 739	2%	4%	6%	13%	19%	28%	41%	50%	66%	84%	96%	118%	140%	172%
740 - 759	2%	4%	5%	11%	16%	23%	33%	40%	54%	69%	80%	99%	119%	147%
760 - 779	2%	3%	4%	9%	13%	19%	27%	32%	43%	56%	65%	82%	99%	122%
>= 780	2%	3%	3%	7%	10%	14%	21%	25%	33%	43%	50%	63%	77%	96%

Before CCA

Today

Source: Guy Carpenter Analytics., FHFA

Disclaimer

GC Analytics® Disclaimer

The data and analysis provided by Guy Carpenter herein or in connection herewith are provided "as is," without warranty of any kind whether express or implied. The analysis is based upon data provided by the company or obtained from external sources, the accuracy of which has not been independently verified by Guy Carpenter. Neither Guy Carpenter, its affiliates, nor their officers, directors, agents, modelers, or subcontractors (collectively, "Providers") guarantee or warrant the correctness, completeness, currentness, merchantability, or fitness for a particular purpose of such data and analysis. The data and analysis is intended to be used solely for the purpose of the company's internal evaluation and the company shall not disclose the analysis to any third party, except its reinsurers, auditors, rating agencies and regulators, without Guy Carpenter's prior written consent. In the event that the company discloses the data and analysis, or any portion thereof, to any permissible third party, the company shall adopt the data and analysis as its own. In no event will any Provider be liable for loss of profits or any other indirect, special, incidental and/or consequential damage of any kind howsoever incurred or designated, arising from any use of the data and analysis provided herein or in connection herewith.

Statements or analysis concerning or incorporating tax, accounting or legal matters should be understood to be general observations or applications based solely on our experience as reinsurance brokers and risk consultants and may not be relied upon as tax, accounting or legal advice, which we are not authorized to provide. All such matters should be reviewed with the client's own qualified advisors in these areas.

There are many limitations on actuarial or modeling analyses, including uncertainty in the estimates and reliance on data. We will provide additional information regarding these limitations upon request.

As with any analysis, the results presented herein are subject to significant variability. While these estimates represent our best professional judgment, it is probable that the actual results will differ from those projected. The degree of such variability could be substantial and could be in either direction from our estimates.

Reliances and Limitations

- These slides are for general informational purposes only. Action should not be taken solely on the basis of the information set out herein without taking specific advice.
- No portion of this presentation or supporting material may be provided to any other party without Milliman's prior written consent.
- Neither the presenter, his employer, nor the Casualty Actuarial Society shall have any responsibility or liability to any person or entity with respect to damages alleged to have been caused directly or indirectly by the content of this presentation.
- Any Milliman estimates referenced herein, including M-PIRe estimates, make no provision for extraordinary future emergence of new classes of losses or types of losses not sufficiently represented in historical mortgage performance databases or that are not yet quantifiable, including the potential impact of the emerging situation regarding the COVID-19 pandemic. There is substantial uncertainty regarding the impact of COVID-19 on the level of mortgage default, prepayment, and severity rates. Exposures, claim frequency, and claim severity will likely be affected in ways we cannot currently estimate. It is important to recognize that actual losses may emerge significantly higher or lower than the estimates in this analysis. It is unknown how the COVID-19 pandemic may affect the timeliness of future default losses.
- Milliman should be contacted directly in order to license M-PIRe and have a proper understanding of forecasts contained therein and all the inputs, methodologies, assumptions and qualifications and limitations surrounding such estimates.