PMI market trends and highlights: 3Q 2022

Credit performance remains strong, reserve releases continue, but future macro uncertainty remains. Some PMIs discuss selective pricing increases. Two PMIs issue ILNs at historically wide pricing.

Trends highlighted in 2Q 2022 generally continued in 3Q 2022: IIF loan performance remains strong and persistency on in-force policies continues to increase. The PMIs continue to release previously established reserves—most PMIs posting their fourth straight quarters with a negative loss ratio. Despite this strength, the PMIs faced many questions on recession risks and housing slowdowns; many mentioned selective pricing increases to account for this uncertainty. Two Capital Markets ILNs were issued in the quarter; pricing was historically wide.

The U.S. private mortgage insurer (PMI) market is made of up six insurers—Arch, Enact, NMI, Radian, MGIC, and Essent. As part of their financial disclosures, the PMIs summarize new insurance written (NIW) during a given reporting period, the size and performance of their insurance in force (IIF), and other financial items.

Milliman has compiled this data to build an aggregate view of the quarter for each PMI company and for the industry as a whole. Furthermore, key statements from the PMIs' earnings calls are summarized to provide additional insight into industry trends and developments. The following update highlights key trends Milliman identified during the most recent quarter.

The PMIs reported third quarter (3Q) 2022 earnings in early November 2022. While strong performance continues, the PMIs faced questions on recession risks and housing slowdowns in their earnings calls—some PMIs discussed selective pricing increases. Salient excerpts on this topic from the PMIs' earnings calls are included in the Appendix.

Lastly, two PMIs issued capital markets mortgage insurance-linked notes (ILNs). Pricing levels were markedly wider than early 2022 and 2021 levels. Additional information on the PMIs' insurance-linked note (ILN) issuance and performance (e.g., collateral composition and cash flow estimates from both the collateral and securities) can be obtained from Milliman Mortgage Platform for Investments and Reinsurance (M-PIRe™).

For 3Q 2022, this report provides a:

- Summary of NIW
- Summary of IIF
  - Volume/persistency
  - Performance
- Summary of capital markets ILN issuances
  - New issuances
- Appendix: Additional excerpts from earnings calls
  - Recession risk and pricing

Introduction

Milliman provides consulting services and an analytic platform (Milliman M-PIRe) to mortgage investors. Both Milliman M-PIRe and associated consulting services provide fundamental analysis on the risk profile and valuations of mortgage investments, including government-sponsored enterprise (GSE) credit risk transfer (CRT) securities, ILNs, and whole loans. Many of our clients either insure mortgage credit risk (direct or through reinsurance) and/or are investors in CRT and ILNs. This report is created and published to help summarize key trends in the mortgage insurance industry to help our clients make informed decisions on their participation in the sector.

Quarterly NIW results and IIF trends

SUMMARY OF QUARTERLY RESULTS

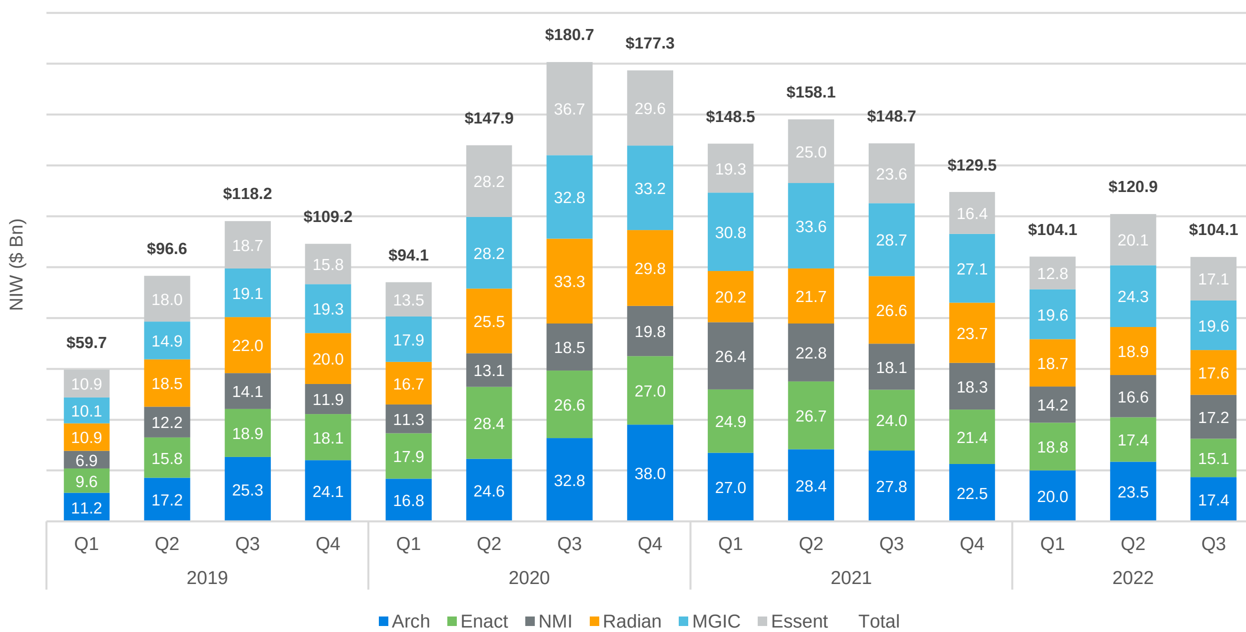
Consistent with 2Q, sustained rises in mortgage rates have shifted NIW to almost entirely purchase originations—NIW consisted of over 98% purchase originations in 3Q 2022. As detailed in past editions of this report, high interest rates and high house prices (brought on by high appreciation over the past several years) will likely continue to weigh on NIW as housing affordability is strained. However, the 30-year fixed mortgage rate has decreased 59 basis points (bps) off 2022 highs.[1] Sustained decreases in rates can lead to refinance opportunities for existing mortgages and better affordability for new buyers—both can lead to increased NIW.

NIW VOLUME AND MARKET SHARE

Primary NIW in 3Q 2022 was $104.1 billion, a decrease of 14% quarter-over-quarter and a decrease of 30% year-over-year. The $104.1 billion is comprised of $102.3 billion of purchase mortgages (98%) and $1.7 billion of refinance mortgages (2%).

MGIC reported the largest market share in the quarter, writing $19.6 billion (18.8%), followed by Radian ($17.6 billion, 16.9%), Arch ($17.4 billion, 16.7%), NMI ($17.2 billion, 16.6%), Essent ($17.1 billion, 16.4%), and Enact ($15.1 billion, 14.5%).

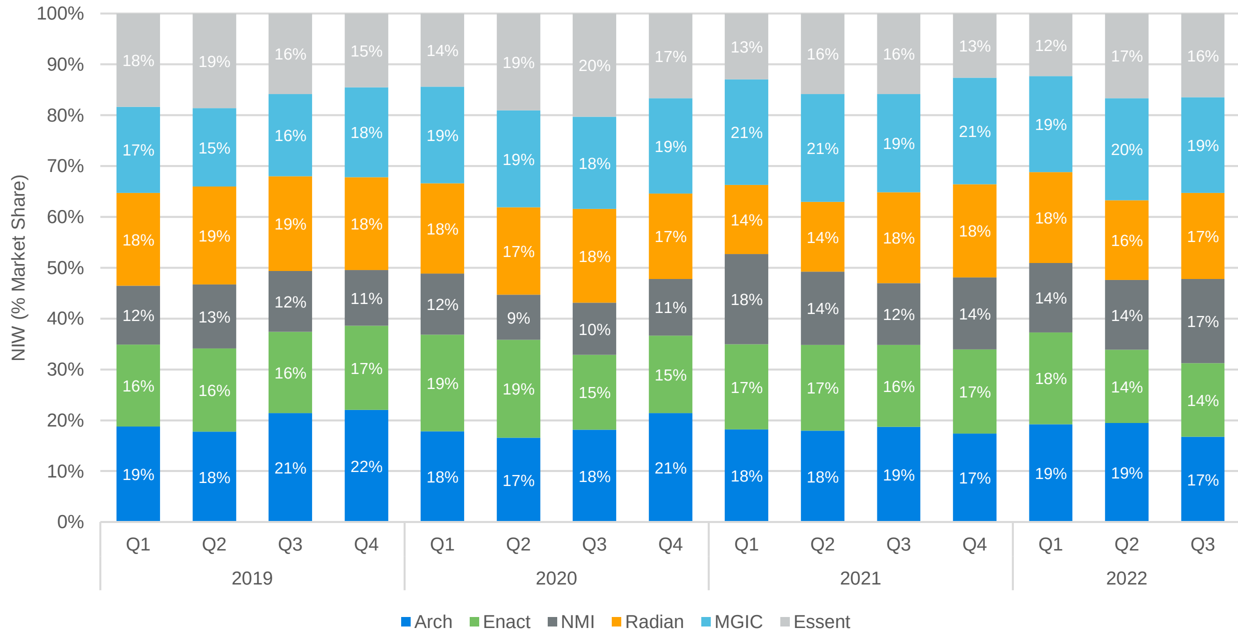
FIGURE 1: QUARTERLY NEW INSURANCE WRITTEN, $ BILLION BY PMI, 2019-2022



Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

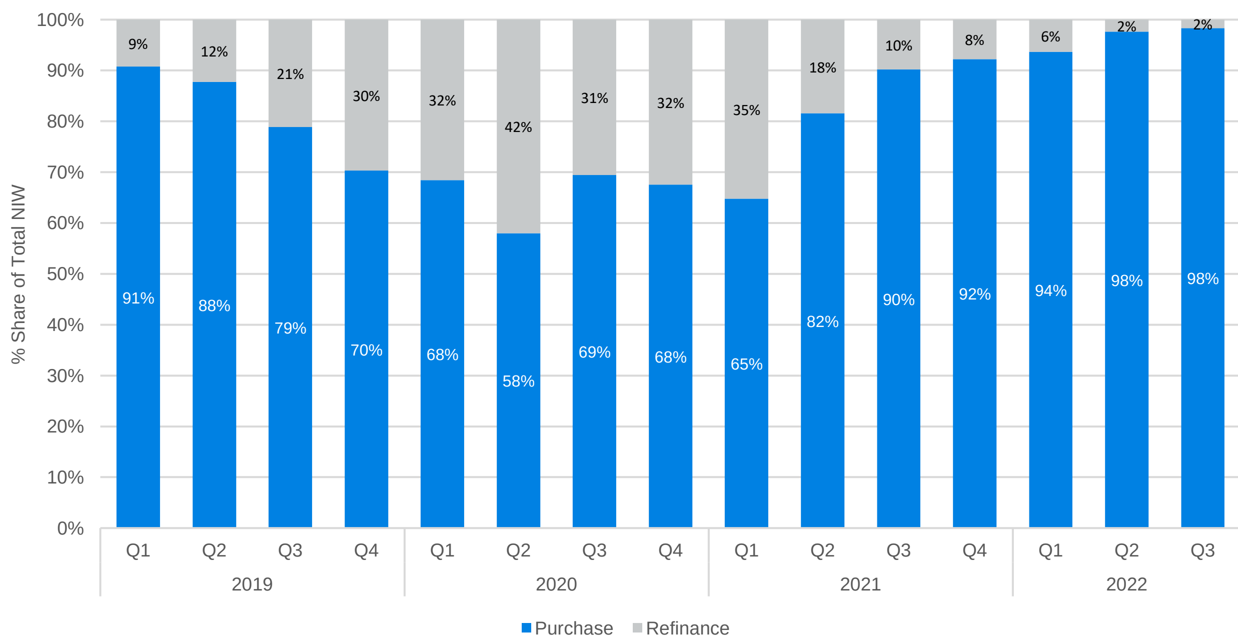
[1] Freddie Mac (December 1, 2022). Mortgage Rates. Retrieved December 3, 2022, from http://www.freddiemac.com/pmms/#.

FIGURE 2: QUARTERLY NEW INSURANCE WRITTEN, % MARKET SHARE BY PMI, 2019-2022



Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

FIGURE 3: QUARTERLY PURCHASE VS. REFINANCE SHARE, NIW MARKET, 2019-2022



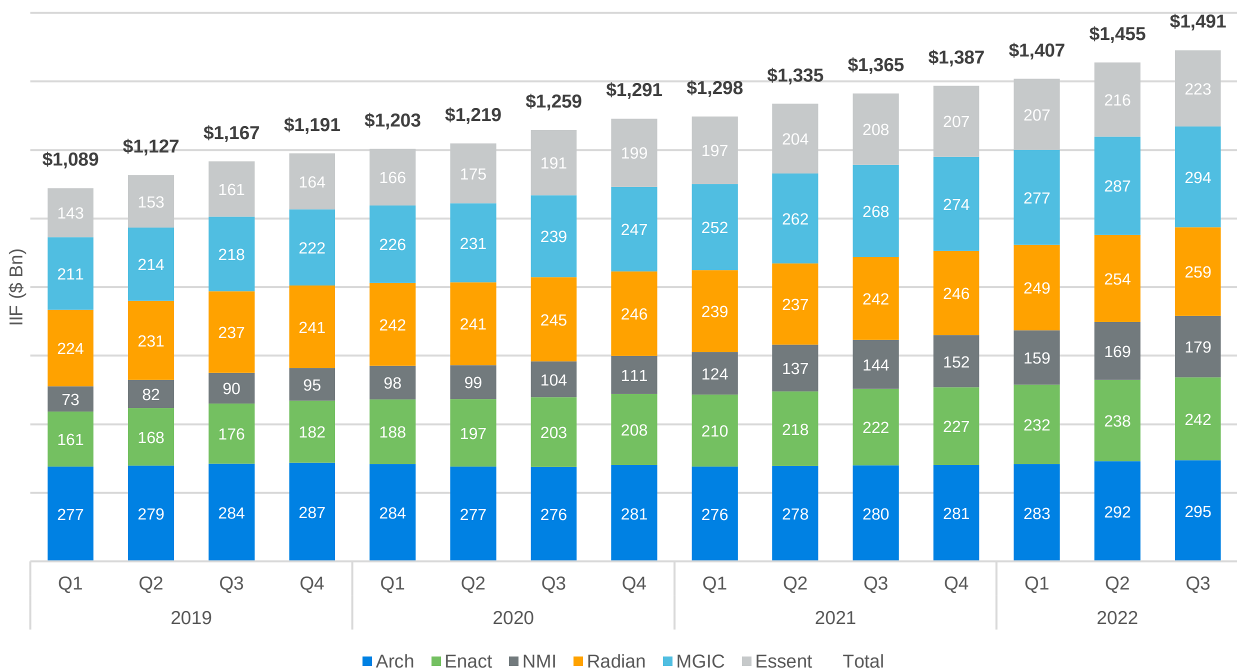
Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

Figure 3 shows the percentage makeup of purchase versus refinance originations. 3Q 2022 marks the smallest share of refinances (2%) since at least 2018.[2]

MARKET-LEVEL IIF TRENDS

Primary IIF in 3Q 2022 was $1,491 billion, an increase of 2% quarter-over-quarter and an increase of 9% year-over-year. All six insurers increased IIF from the prior quarter. IIF market share in 2Q 2022 was Arch 19.8%, MGIC 19.7%, Radian 17.4%, Enact 16.2%, Essent 14.9%, and NMI 12.0%.

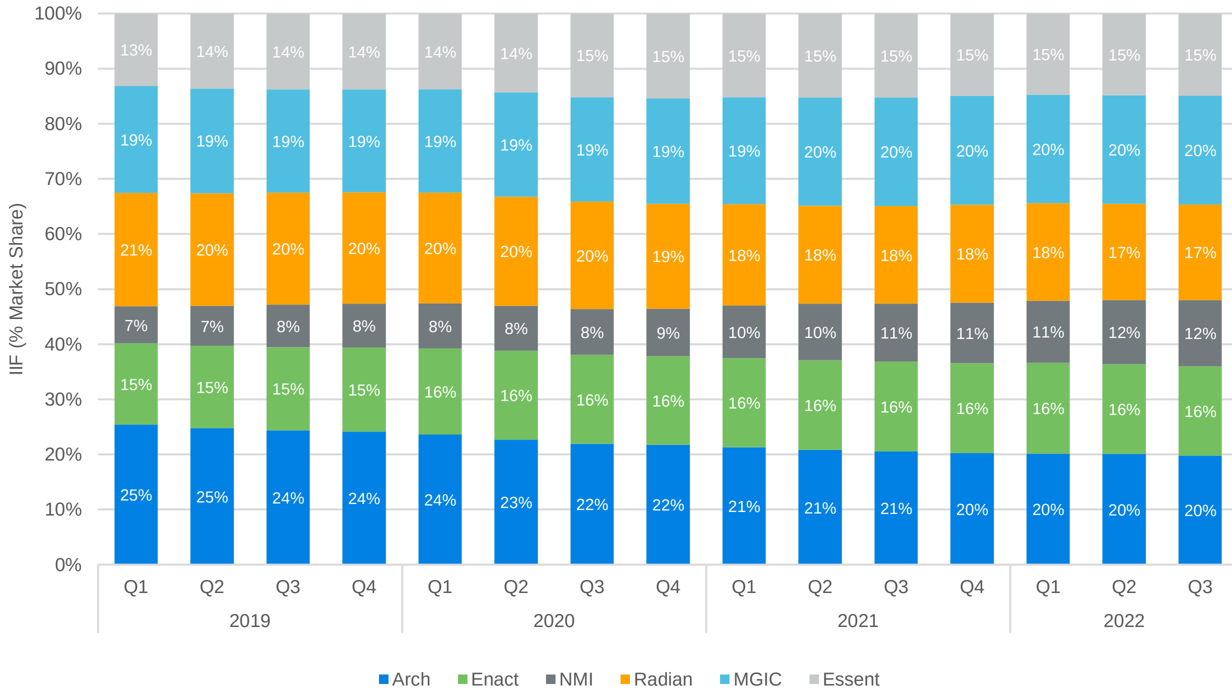
FIGURE 4: REPORTED INSURANCE IN FORCE, BY QUARTER, 2019-2022



Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

[2] Milliman began tracking PMI quarterly performance in 1Q 2018.

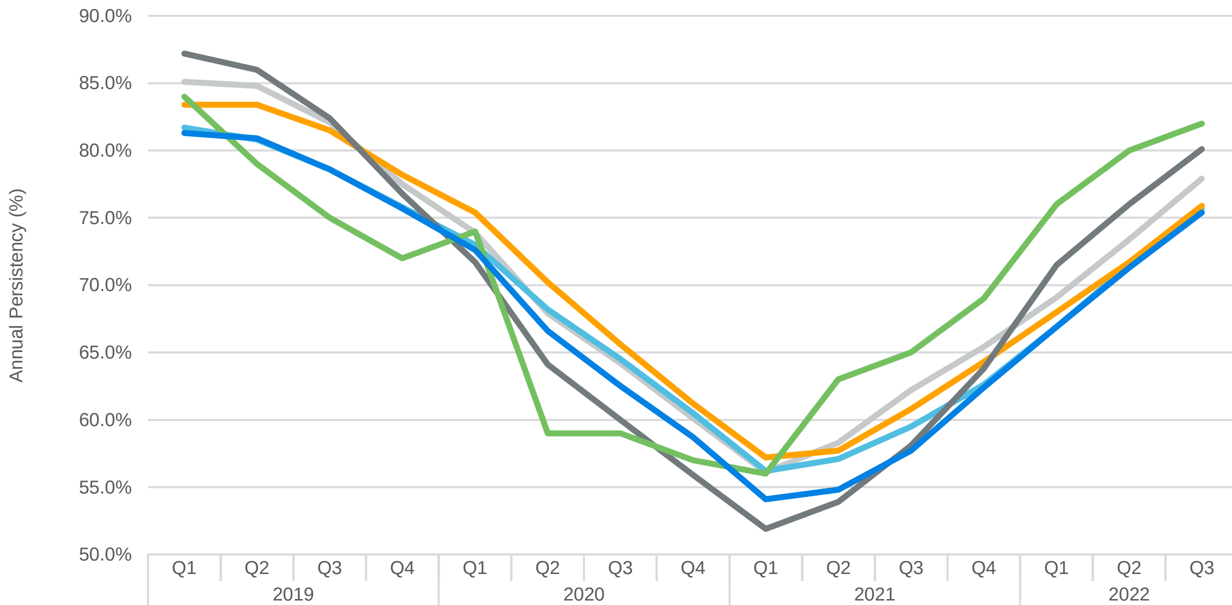
FIGURE 5: REPORTED INSURANCE IN FORCE, % MARKET SHARE BY PMI, 2019-2022



Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

In 3Q 2022 IIF persistency measured 77.6%; while persistency is currently still lower than 2018 (82%), the 3Q 2022 rate is now in line with the 2H 2019 rate (78%) and continuing to trend higher. Persistency is defined as the percentage of IIF that remained in force after the trailing 12-month period. The increase in persistency is consistent with increases in interest rates and few refinance opportunities for existing borrowers, as discussed above. It is anticipated persistency will continue to remain elevated for the next several quarters as the effects of higher mortgage rates continue to impact prepayment speeds.

FIGURE 6: ANNUAL PERSISTENCY RATES, % OF IIF REMAINING IN FORCE AFTER THE TRAILING 12-MONTH PERIOD, BY QUARTER, 2019-2022



	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Essent	85.1%	84.8%	82.1%	77.5%	73.9%	67.9%	64.2%	60.1%	56.1%	58.3%	62.2%	65.4%	69.1%	73.4%	77.9%
MGIC	81.7%	80.8%	78.6%	75.8%	73.0%	68.2%	64.5%	60.5%	56.2%	57.1%	59.5%	62.6%	66.9%	71.5%	75.7%
Radian	83.4%	83.4%	81.5%	78.2%	75.4%	70.2%	65.6%	61.2%	57.2%	57.7%	60.8%	64.3%	68.0%	71.7%	75.9%
NMI	87.2%	86.0%	82.4%	76.8%	71.7%	64.1%	60.0%	55.9%	51.9%	53.9%	58.1%	63.8%	71.5%	76.0%	80.1%
Enact	84.0%	79.0%	75.0%	72.0%	74.0%	59.0%	59.0%	57.0%	56.0%	63.0%	65.0%	69.0%	76.0%	80.0%	82.0%
Arch	81.3%	80.9%	78.6%	75.7%	72.6%	66.6%	62.5%	58.7%	54.1%	54.8%	57.7%	62.4%	66.9%	71.3%	75.4%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

Delinquent loan performance

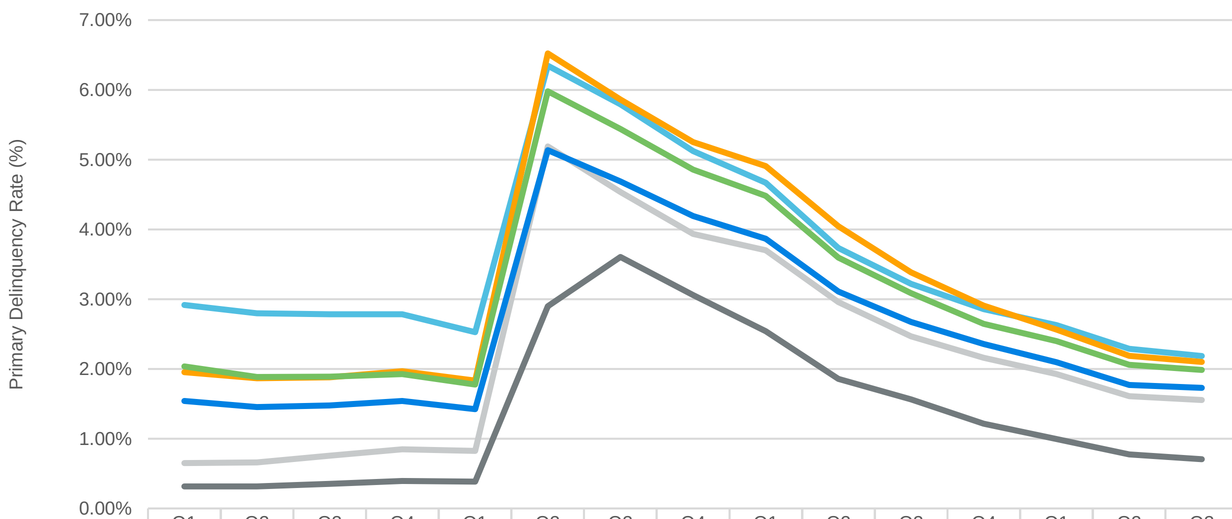
The PMIs reported a high level of incurred losses in 2Q 2020 due to the initial wave of COVID-19-related delinquencies. However, the delinquent inventories of all six PMIs have decreased every quarter since. The inventories as of 3Q 2022 (i.e., the cumulative number of delinquent loans) are now nearly in line with pre-COVID-19 levels. This section provides an update on signals from the PMIs' delinquent inventories (e.g., new notices, cures, claims paid).

Overall, cures still outpaced new notices of default, resulting in an aggregate decline in the delinquent inventory. However, the cure-to-notice ratio for 3Q 2022 was only 105%—meaning cures only marginally outpaced new delinquencies in the quarter. Given the macroeconomic uncertainty, there is the possibility for an uptick in delinquencies in future quarters.

DELINQUENT INVENTORY TRENDS

The charts in Figures 7 through 11 display rates that influence the primary delinquency rate (e.g., new notice rate, cure rate, paid claims rate). These rates provide information on the inflow of new delinquencies, the outflow of cured delinquencies, and the outflow of paid claims on delinquencies, respectively. Decomposition of the changes in the primary delinquency rate into these other rates can provide information on the drivers of the headline change (e.g., a decrease in the primary delinquency rate could be due to cures outpacing delinquencies, or it could be driven by minimal changes in the delinquent inventory and simply a rise in policies in force, leading to a decrease in the rate relative to the population).[3]

FIGURE 7: QUARTERLY PERCENTAGE OF IIF IN DELINQUENCY, PERCENTAGE OF ENDING POLICIES IN FORCE, COUNT-WEIGHTED, BY PMI, 2019-2022



	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Essent	0.65%	0.66%	0.75%	0.85%	0.83%	5.19%	4.54%	3.93%	3.70%	2.96%	2.47%	2.16%	1.93%	1.61%	1.55%
MGIC	2.92%	2.80%	2.78%	2.78%	2.53%	6.35%	5.79%	5.12%	4.67%	3.73%	3.22%	2.86%	2.63%	2.29%	2.18%
Radian	1.95%	1.87%	1.88%	1.97%	1.83%	6.52%	5.86%	5.25%	4.91%	4.04%	3.38%	2.91%	2.56%	2.19%	2.10%
NMI	0.32%	0.32%	0.35%	0.40%	0.38%	2.90%	3.60%	3.06%	2.54%	1.86%	1.56%	1.22%	0.99%	0.77%	0.71%
Enact	2.04%	1.88%	1.89%	1.93%	1.78%	5.98%	5.44%	4.86%	4.48%	3.60%	3.08%	2.65%	2.40%	2.06%	1.99%
Arch	1.54%	1.45%	1.48%	1.54%	1.42%	5.14%	4.69%	4.19%	3.86%	3.11%	2.67%	2.36%	2.09%	1.77%	1.73%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

[3] Note that, for more current data, most of the PMIs release monthly operating statistics that provide monthly updates to the delinquency trends discussed in this section.

The weighted-average primary delinquency rate decreased from 5.65% in 2Q 2020 to 1.80% in 3Q 2022 (Figure 7). During this time, the new notice of default rate decreased from 5.07% to less than 1% (Figure 8). In 2Q 2021 the new notice rate of 0.68% declined below the weighted-average quarterly rate reported from 1Q 2018 through 1Q 2020 of 0.88%. From the 2Q 2021 level of 0.68%, new notices have broadly remained in line with or lower than 2018-2019 levels (0.84% as of 3Q 2022). New notices at this level should contribute to further declines in the primary delinquency rate, all else equal, as the older, larger cohorts of new notices cure and are replaced with these newer, smaller cohorts.

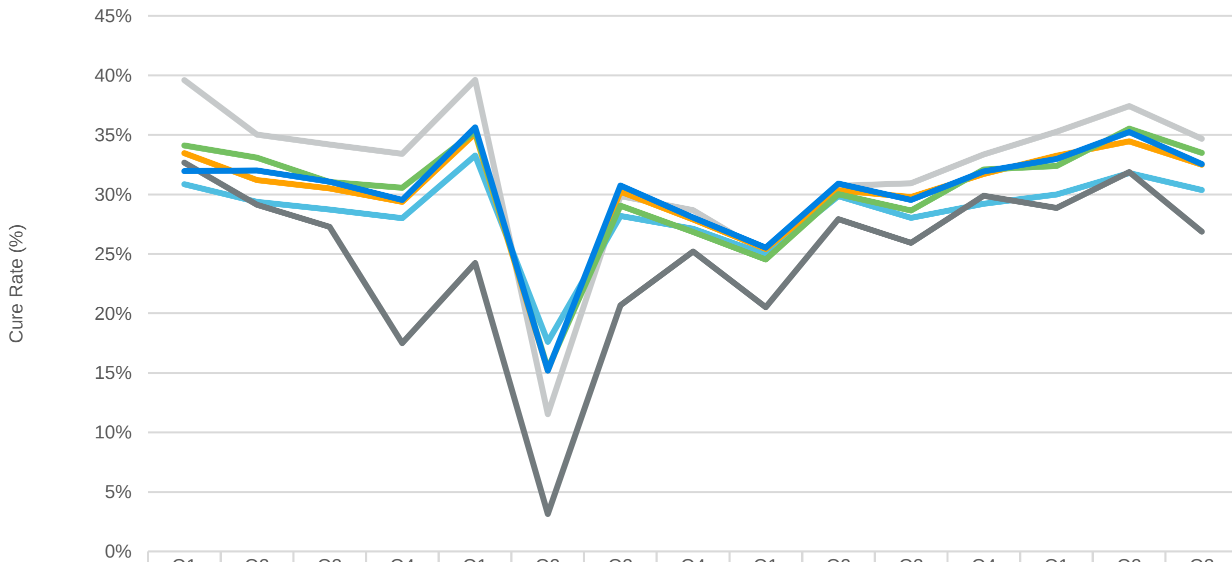
FIGURE 8: QUARTERLY NEW NOTICE OF DEFAULT RATE, % OF STARTING POLICIES IN FORCE, COUNT-WEIGHTED, BY PMI, 2019-2022

	2019				2020				2021				2022		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Essent	0.48%	0.45%	0.56%	0.55%	0.56%	5.29%	1.72%	1.12%	0.93%	0.63%	0.65%	0.73%	0.79%	0.71%	0.82%
MGIC	1.29%	1.22%	1.32%	1.27%	1.15%	5.31%	1.92%	1.37%	1.16%	0.80%	0.86%	0.91%	0.92%	0.81%	0.94%
Radian	1.00%	0.91%	1.00%	1.01%	0.92%	5.84%	1.92%	1.36%	1.12%	0.80%	0.81%	0.94%	0.94%	0.81%	0.96%
NMI	0.20%	0.18%	0.22%	0.17%	0.14%	2.59%	1.77%	0.68%	0.44%	0.25%	0.34%	0.25%	0.23%	0.20%	0.25%
Enact	1.08%	0.97%	1.06%	1.04%	0.95%	5.57%	1.86%	1.30%	1.09%	0.74%	0.80%	0.88%	0.93%	0.83%	0.96%
Arch	0.75%	0.69%	0.78%	0.79%	0.72%	4.51%	1.59%	1.17%	0.88%	0.61%	0.67%	0.76%	0.75%	0.69%	0.81%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

The weighted-average cure rate was 15% in 2Q 2020 as the initial stress of the pandemic led to many borrowers entering into, and remaining in, a state of delinquency during the quarter (Figure 9). Since that low, the cure rate improved sequentially to the low 30s% (32% in 3Q 2022). This has generally been in line with or higher than the weighted-average cure rate of 31%, reported from 1Q 2018 through 1Q 2020.

FIGURE 9: QUARTERLY CURE RATE, % OF STARTING DELINQUENCIES PLUS NEW NOTICES, COUNT-WEIGHTED, BY PMI, 2019-2022

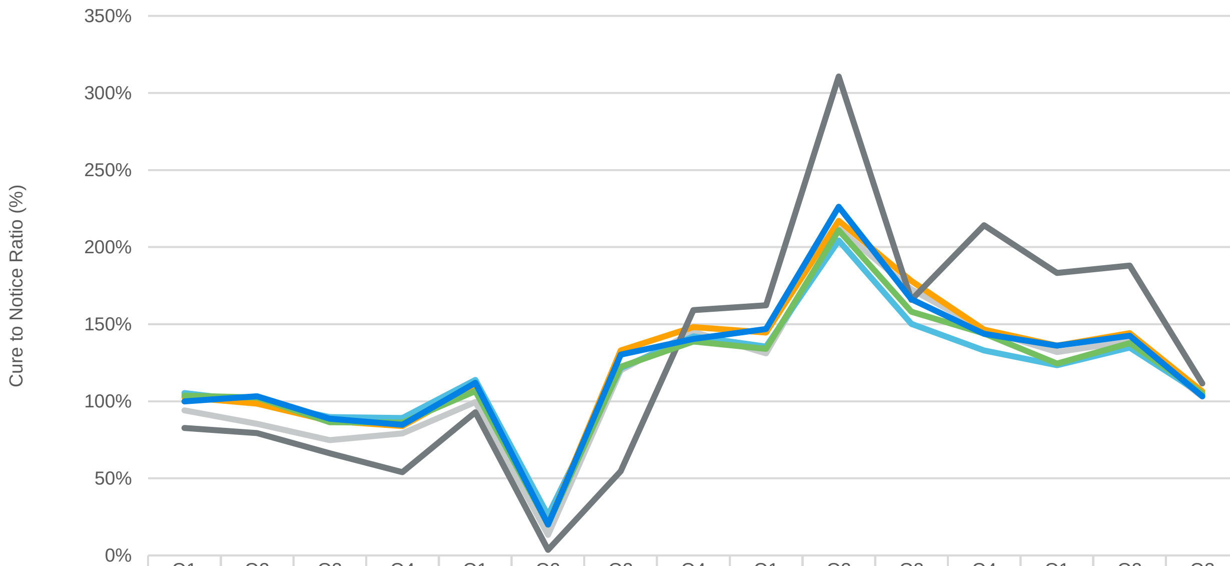


	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Essent	40%	35%	34%	33%	40%	12%	30%	29%	25%	31%	31%	33%	35%	37%	35%
MGIC	31%	29%	29%	28%	33%	18%	28%	27%	25%	30%	28%	29%	30%	32%	30%
Radian	33%	31%	31%	29%	35%	15%	30%	28%	25%	30%	30%	32%	33%	34%	32%
NMI	33%	29%	27%	18%	24%	3%	21%	25%	21%	28%	26%	30%	29%	32%	27%
Enact	34%	33%	31%	31%	35%	15%	29%	27%	25%	30%	29%	32%	32%	36%	33%
Arch	32%	32%	31%	30%	36%	15%	31%	28%	26%	31%	30%	32%	33%	35%	33%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

Comparing the number of loans curing to the number of new notices in the quarter, we can obtain a ratio that generally expresses whether the delinquent inventory is growing or shrinking in the quarter. Ignoring paid claims, rescissions, and denials, a ratio over 100% indicates a net decrease in the delinquent inventory over the quarter. In 3Q 2022, the ratio of cures to defaults was 105% (Figure 10). Although still over 100%, and broadly in line with the pre-COVID-19 levels (102% average from 1Q 2018 through 1Q 2020), this is the lowest level of this metric since 2Q 2020.

FIGURE 10: QUARTERLY CURE TO NEW NOTICE RATIO, CURE COUNT DIVIDED BY NEW NOTICE COUNT, BY PMI, 2019-2022



	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Essent	94%	85%	75%	79%	100%	13%	120%	145%	131%	212%	173%	147%	132%	139%	103%
MGIC	105%	100%	90%	89%	114%	26%	122%	142%	135%	204%	150%	133%	123%	135%	105%
Radian	103%	98%	87%	84%	110%	20%	133%	148%	145%	217%	178%	146%	136%	144%	106%
NMI	83%	79%	66%	54%	93%	4%	55%	159%	162%	311%	166%	214%	183%	188%	112%
Enact	104%	102%	86%	86%	107%	20%	122%	139%	134%	211%	158%	144%	124%	138%	105%
Arch	100%	103%	89%	85%	112%	20%	130%	140%	147%	226%	166%	144%	136%	142%	103%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

Lastly, foreclosure moratoriums reduced the number of paid claims during the pandemic (Figure 11). Given that PMI claims are generally not submitted until a property title is transferred from the borrower to the lender via foreclosure, the foreclosure moratoriums—which were in place from 2Q 2020 through part of 3Q 2021—directly reduced claims paid since the introduction of the foreclosure moratorium.

In 2022, PMIs have largely commented that they expect foreclosure and claim activity to gradually return to pre-COVID-19 levels. However, we have not seen such dynamics reflected in the data, as claim counts remain well below pre-COVID-19 levels.

Essent[4]

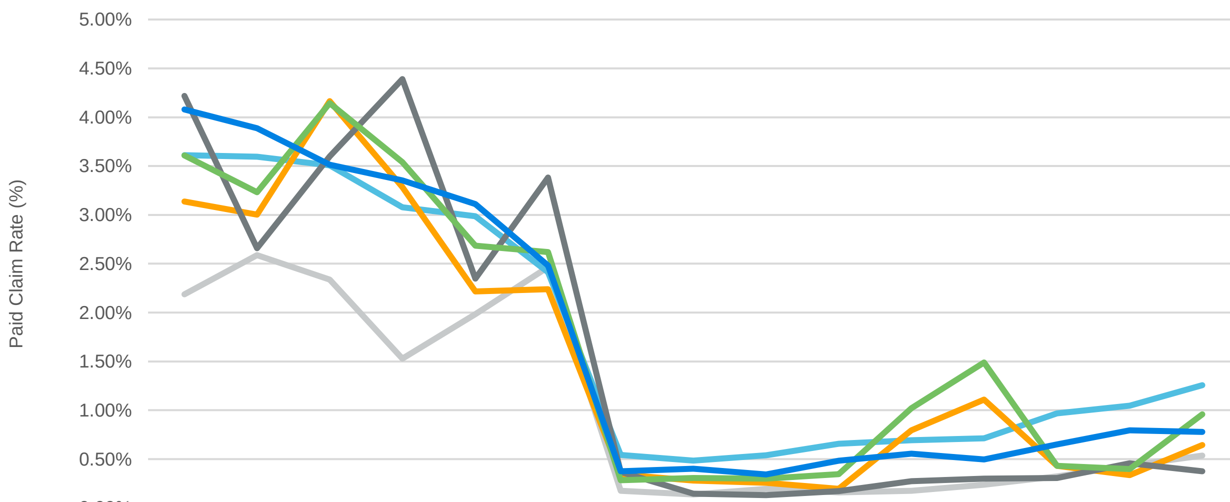
David Weinstock

… we are seeing really not a return to normalcy for foreclosures and for claims. So foreclosure moratoriums kind of ended at the end of the first quarter. And not surprisingly we hadn't seen a lot of foreclosure activity in the second quarter, but we thought that might start picking up in the third quarter and really did not significantly change much from the second quarter. Same thing really with claims activity.

So we are – as we said, we're seeing a kind of a build-up of some late stage delinquencies. And so that along with what's happening in the environment with what you're seeing with interest rates and maybe how that may affect borrowers and their options, especially severely delinquent borrowers. It just – it was something where we felt that clearly risk is building on these later stage delinquencies. And so that really drove an increase in the average reserve for default in the quarter.

We still did have prior period – prior year favorable development. It was probably more muted than we've had in the prior quarters. And some of that's going to be some of the timing things I think that Mark referred to.

FIGURE 11: QUARTERLY PAID CLAIMS RATE, % OF STARTING DELINQUENCIES, COUNT-WEIGHTED, BY PMI, 2019-2022



	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022
Essent	2.19%	2.59%	2.34%	1.53%	1.98%	2.47%	0.18%	0.14%	0.19%	0.16%	0.17%	0.24%	0.32%	0.44%	0.54%
MGIC	3.61%	3.60%	3.51%	3.08%	2.99%	2.41%	0.54%	0.48%	0.54%	0.66%	0.69%	0.71%	0.97%	1.05%	1.25%
Radian	3.14%	3.00%	4.16%	3.28%	2.21%	2.24%	0.34%	0.28%	0.26%	0.20%	0.79%	1.11%	0.43%	0.34%	0.64%
NMI	4.22%	2.66%	3.60%	4.39%	2.35%	3.38%	0.37%	0.15%	0.13%	0.17%	0.27%	0.30%	0.31%	0.46%	0.37%
Enact	3.61%	3.23%	4.14%	3.54%	2.68%	2.62%	0.28%	0.31%	0.30%	0.35%	1.02%	1.49%	0.43%	0.40%	0.96%
Arch	4.08%	3.89%	3.51%	3.35%	3.11%	2.48%	0.38%	0.40%	0.34%	0.48%	0.55%	0.50%	0.65%	0.80%	0.78%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

[4] See https://seekingalpha.com/article/4553218-essent-group-ltd-esnt-q3-2022-earnings-call-transcript.

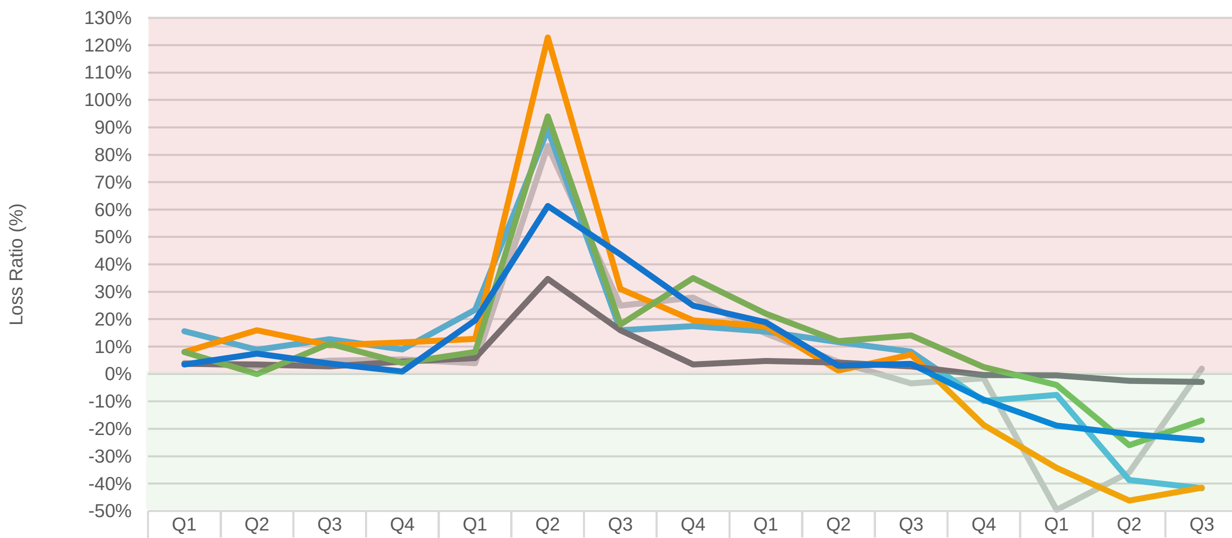
LOSS RESERVES

Under GAAP, the loss reserves of the PMIs are established for policies only after the loan becomes delinquent. Generally, the PMIs are notified upon a 60-day delinquency, and the reserves reflect the current delinquency episode. The PMIs estimate the liability for losses related to the outstanding delinquent inventory and establish that amount as loss reserves. The underlying claim rate and claim severity estimates used in the reserving process are typically based on historical experience but can fluctuate based on current economic circumstances (e.g., the COVID-19-caused economic disruption).

Given the high level of new notices in 2Q 2020 and 3Q 2020, a large portion of the PMIs' reserves are from notices occurring in those quarters. The PMIs began to release reserves from some cohorts of pre- and early COVID-19-related delinquencies in 4Q 2021. This was driven largely by the to-date performance of the loans—beginning to match, and eclipse, the PMIs' original cure rate assumptions (i.e., it is becoming clear that more loans will revert to "performing" than the PMIs originally assumed). This has continued in 3Q 2022 as indicated by the loss ratios displayed in Figure 12.

Loss ratios are generally defined as losses incurred in the quarter (which are a function of the number of loans that went delinquent in the quarter, the assumed claim rate, and the assumed loss severity) divided by the premium earned in the quarter. However, when a PMI releases reserves from prior periods, they are netted out of the new, incurred losses established in the quarter.

FIGURE 12: QUARTERLY REPORTED LOSS RATIO, BY PMI, 2019-2022



	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Essent	4.0%	2.6%	4.9%	5.3%	3.9%	83.2%	24.9%	27.9%	14.8%	4.4%	-3.4%	-1.6%	-49.6%	-35.9%	2.0%
MGIC	15.6%	8.8%	12.7%	8.9%	23.4%	89.2%	15.9%	17.5%	15.5%	11.6%	8.1%	-9.9%	-7.6%	-38.7%	-41.7%
Radian	8.0%	15.9%	10.5%	11.5%	12.8%	122.8%	31.0%	19.6%	17.3%	1.3%	7.1%	-18.6%	-34.3%	-46.2%	-41.5%
NMI	3.7%	3.5%	2.8%	4.5%	5.8%	34.7%	15.9%	3.5%	4.7%	4.2%	2.8%	-0.4%	-0.5%	-2.5%	-2.9%
Enact	8.0%	0.0%	11.0%	4.0%	8.0%	94.0%	18.0%	35.0%	22.0%	12.0%	14.0%	2.5%	-4.0%	-26.0%	-17.0%
Arch	3.5%	7.4%	3.8%	0.9%	19.6%	61.3%	43.6%	24.9%	18.9%	3.0%	3.7%	-9.4%	-18.9%	-21.9%	-24.1%

Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

Risk transfer: Capital markets ILN issuances

In 2020 and 2021, 12 and 14 PMI insurance-linked notes (ILNs) transactions were issued, respectively. Through December 11, only four ILNs have been issued in 2022. Two of those issuances took place since the last edition of this report.

The lower to-date issuance in 2022 is attributable to market pricing—weighted-average (WA) spread over the Secured Overnight Financing Rate (SOFR). Spreads have widened considerably from 2021 levels and have generally been regarded as uneconomical as compared to obtaining traditional reinsurance. The two issuances that took place since the last edition of this report further reinforce this. Lastly, we include excerpts from Essent's and Radian's earning calls for additional context on the ILN market.

Figure 13 provides a summary of recent PMI capital markets ILN issuances in 2021 and early 2022.[5] Row 2 indicates whether a vertical slice of the structure was executed via the reinsurance market in tandem with the bond offering.[6]

FIGURE 13: RECENT PMI CAPITAL MARKETS ILN TRANSACTIONS

	Enact TMIR 21-2	Radian EMIR 21-1	NMI OMIR 21-1	Arch BMIR 21-2	Essent RMIR 21-1	MGIC HMIR 21-2	Enact TMIR 21-3	Arch BMIR 21-3	NMI OMIR 21-2	Radian EMIR 21-2	Essent RMIR 21-2	Arch BMIR 22-1	MGIC HMIR 22-1	Essent RMIR 22-1	Arch BMIR 22-2
Settle Date	4/16	4/22	4/27	6/17	6/23	8/3	9/2	9/28	10/26	11/9	11/10	1/31	4/26	9/21	9/30
ILN Reinsurance Co-Participation?	No	No	No	**Yes**	No	No	No	**Yes**	No	No	No	**Yes**	No	No	**Yes**
Total Bonds Issued ($M)	303	498	367	523	558	398	372	512	364	484	439	284	474	238	201
Coverage Attachment Point %	2.25	2.00	1.85	1.90	2.00	2.10	2.50	2.25	1.85	2.25	2.25	2.50	2.75	3.25	2.50
Coverage Detachment Point %	7.00	6.50	6.00	9.50	6.00	6.50	6.75	12.00	6.45	6.75	7.25	7.50	6.75	6.50	6.50
Min CE %	8.25	7.50	6.75	10.50	7.50	7.25	7.75	10.00*	7.45	7.75	7.75	8.50	7.50	7.00	7.50
WA Spread (bps)	452	361	312	222	262	272	317	207	299	302	424	350	545	731	801
Term (yrs)	12.5	12.5	12.5	10.0	12.5	12.5	12.5	10.0	12.5	12.5	10.0	10.0	12.5	10.0	10.0
Optional Call (yrs)	7	7	5	7	7	7	7	6	5	7	6	5	6	6	5

Source: Milliman M-PIRe, Bloomberg, DBRSMorningstar, Moodys.

Since the last publication, Essent RMIR 22-1 and Arch BMIR 22-2 have been issued. Two notable characteristics of these issuances were smaller issuance size—driven by both more risk retained in each issued class as well as by issuing a smaller vertical span of Risk-In-Force (RIF)—and historically wide pricing.

Essent's transaction issued notes from an attachment point of 3.25% to a detachment point of 6.50%, or 3.25% of risk. Its prior transaction issued from 2.25% to 7.25%, or 4% of risk. Additionally, of the 3.25% of risk issued, Essent retained a larger percentage of the risk than in prior transactions—i.e., not issuing the entire class of notes. Both factors led to a total issuance amount of over $200 million less than RMIR 21-2.

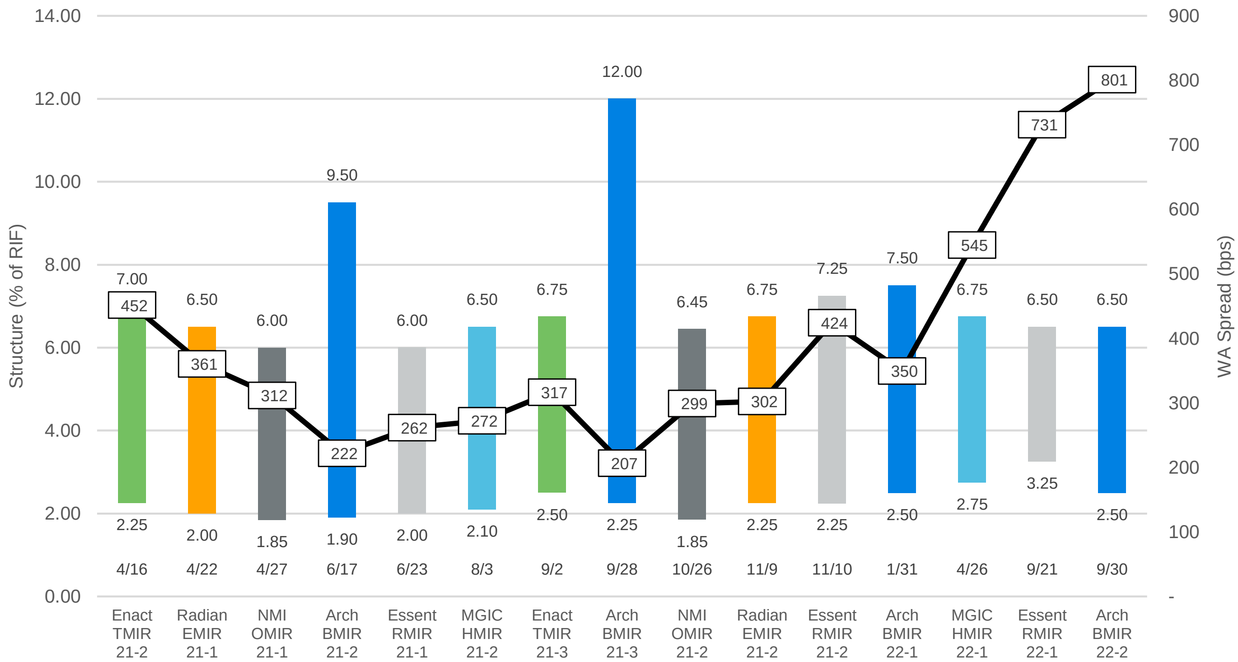
Figure 14 visually displays coverage attachment and detachment points along with the weighted-average (WA) spread for the transactions.[7] These two recent transactions shows spread levels that have not been seen on new issues since the ILN market was established.

[5] Note that, for consistency, TMIR 21-1 is not shown in the exhibits. TMIR 21-1 was based on an "off-the-run" seasoned reference pool.

[6] Several PMIs have reinsurance programs that cover a portion of the risk in their ILNs. The co-participation field refers specifically to transactions where reinsurers are offered a portion of the reference pool risk in a structure consistent with the capital markets (i.e., similar to the Freddie Mac STACR/ACIS-linked transactions).

[7] Weighted-average spread calculated as = SUMPRODUCT(Size, WAL, Spread) / SUMPRODUCT(Size, WAL) across all issued tranches. Weighted-average lives (WALs) not displayed for EMIR 20-1, OMIR 20-1, EMIR 20-2, EMIR 21-1, OMIR 21-1, and BMIR 21-3 on Bloomberg—WALs for same-named tranches on RMIR 20-1, BMIR 20-2, TMIR 20-1, HMIR 21-1, HMIR 21-1, and EMIR 21-2, respectively, were used as proxies.

FIGURE 14: RECENT PMI CAPITAL MARKETS ILN TRANSACTIONS (BARS: CEDED RISK, LINE: WA SPREAD)



Source: Milliman M-PIRe, Bloomberg, DBRSMorningstar, Moodys.

Summary statistics of the reference pools are provided in Figure 15.

FIGURE 15: RECENT PMI CAPITAL MARKETS ILN TRANSACTIONS, REFERENCE POOL CHARACTERISTICS

	Enact TMIR 21-2	Radian EMIR 21-1	NMI OMIR 21-1	Arch BMIR 21-2	Essent RMIR 21-1	MGIC HMIR 21-2	Enact TMIR 21-3	Arch BMIR 21-3	NMI OMIR 21-2	Radian EMIR 21-2	Essent RMIR 21-2	Arch BMIR 22-1	MGIC HMIR 22-1	Essent RMIR 22-1	Arch BMIR 22-2
Number of Loans (K)	124	167	142	123	227	182	167	93	123	153	147	119	219	152	153
UPB ($B)	34.0	49.6	46.0	36.1	68.0	52.0	49.0	28.7	40.4	47.2	47.2	37.3	64.2	53.0	51.7
RIF ($B)	8.4	11.1	8.8	8.1	13.9	9.1	12.1	6.6	7.9	10.8	12.4	6.3	11.8	9.3	9.0
WA Coupon (%)	3.00	2.97	2.90	2.84	3.00	3.00	3.00	3.10	3.10	3.00	3.11	3.05	3.11	4.16	4.02
WA FICO	743	752	757	753	748	749	745	753	752	749	744	750	749	747	753
WA LTV (%)	91.3	90.5	91.0	91.1	90.8	90.7	91.0	91.6	91.6	90.7	92.3	91.8	92.2	92.5	92.2
WA DTI (%)	36.4	35.5	33.5	35.6	36.0	35.1	36.1	35.8	34.5	36.1	36.8	36.3	35.7	37.6	36.8

Source: Milliman M-PIRe, Bloomberg, DBRSMorningstar, Moodys.

The below excerpts provide more context on ILN pricing and market dynamics.

Essent[8]

Eric Hagen

… And then how are we thinking about bringing new ILN transactions with costs at their current level? Like how much flexibility do you think you have to tweak the structure like the attachment or detachment? Or is there just not that much flexibility there? And just how we're thinking about that in general. Thank you.

Mark Casale

…

In terms of the ILN, we issued back in the fourth quarter last year. We saw some tightening or some higher cost to execute. It clearly got worse this year. We were an issuer – another MI was an issuer. I'm a big believer in diversified capital sources. So again, reinsurance is a form of capital – levered capital, but still a form of capital. And I think you want to play in all areas. So we're pleased with our quota share programs, the XOL programs with the reinsurers have gone well. And we like ILNs. We think it's still an early – it's kind of early in the life cycle of that part of the market. It's almost nascent. It's only been around really in size the last five-plus years, and it needs to be strengthened in terms of number of investors.

So our team has done – they did a great job this year widening the investor base. It didn't really come to fruition given where the market is. And there's a lot of causes for that, right. I mean you have a two-year treasury rate of 4%. So these type of investors have other alternatives to put their capital in. There's obviously volatility around the credit, which we see. I mean they see the same things we see in terms of kind of clouds on the horizon. I think just there were victims of that swift increase in rates. So these guys are buying the bonds and having a mark-to-market loss the next day. So that makes it difficult. Doesn't mean you want to – we're still believers in it because it's – again, it's another form. It's in cash. We like the market longer term. Again, just like market share, these things ebb, and they flow.

And in terms of the structure, yes, you can certainly – you can tweak it. You can go – you can take more first loss position. You can tighten the bands. I mean, there's a lot of different things that you can do. But I do think it's important for our industry and the GSEs to be a participant longer term.

And again, if you just look at the execution, it hasn't been that great in the last two deals, but it's been excellent from the history. And so if you average it out, I think it's fine. And I think longer term, it's going to be a good market. So – and again, I think it looks like – in terms of the reinsurance market, there's obviously – you can't all – that's not a bottomless pit of capital with the reinsurers and probably worsening when you think about just their alternatives, right, with the P&C – with the pricing hardening so much in the P&C market, even heard one of our competitors saying, they're going to allocate more capital to that.

And you're hearing that with others. So that's just – like I said earlier, means less to the MI. So you just want to make sure you don't get stuck just on one execution. And again, financial services 101 diversified sources of capital.

[8] See https://seekingalpha.com/article/4553218-essent-group-ltd-esnt-q3-2022-earnings-call-transcript.

Radian[9]

Doug Harter

Thanks, Sticking with pricing. Can you just talk about the relative change in pricing that you've made on your policies and how that would compare to kind of the higher costs that you're seeing on ILNs or XOL reinsurance, just to kind of get a relative sense of how different parts of the market are pricing in the risk.

Derek Brummer

Sure. So in terms of that, and we've talked about this in the past, as we're sitting our pricing, we're not factoring in the cost of risk distribution. So really, the focus factoring in or change in terms of macroeconomic view, where we see market clearing levels. We're really trying to find the pieces or parts of the market that have the highest relative value and economic value, not factoring in risk distribution. Now that being said, certainly, what we've seen on the risk distribution side is a much wider kind of spreads on the ILN market. We haven't seen the traditional reinsurance market kind of price up as much.

You're starting to see a little bit of it. And I think from our perspective, certainly, what you've seen on the ILN side and the spread widening is not really warranted by what we view as the fundamentals in terms of the business we're writing and what we're seeing from a market clearing level perspective.

And I think that has caused us to certainly not issue in the ILN market recently in light of that. We just see the relative value is being more accretive for us to hold that risk given the market clearing levels that we see. And that's not terribly surprising. We're closer to the market. So sometimes you could see those who are further away from the market from our perspective over react in terms of the way they're repricing the market.

[9] See https://seekingalpha.com/article/4553004-radian-group-inc-rdn-q3-2022-earnings-call-transcript.

Appendix: Additional excerpts from earnings calls

The below call excerpts focus on pricing:

Essent[10]

Mark DeVries

Yes. Thank you. Mark, could you just discuss kind of what you're doing around pricing here with some of the growing uncertainties in the market? And what you're observing from competitors?

Mark Casale

Sure. I mean, I think it starts with the environment Mark. As we said in the script, we're clearly levered to unemployment. So it is a slowing economy as far as we're seeing. You're starting to see some weakness in the lower end consumer, particularly driven by inflation versus unemployment. Inflation is a very difficult for the unsecured borrower down kind of below 680, that's our renter. A lot of that shelter inflation is hitting those guys hard and obviously not with us.

But it's certainly something we have our eye on. FHA delinquencies are up a bit and you're starting to see some defaults in the single-family rental or at least delinquencies. And the single-family rental business, some of the larger ones that we follow their average FICO is kind of in that 660 to 680. So again, the environment's there, you're not really seeing it in unemployment. That's pretty much a lagging indicator.

But you're starting to see other signs, particularly even around the technology sector. So, because of that and also I think just the capital markets are a bit volatile. We saw that with our eye on execution, you're starting to see the Property and Casualty business harden, the pricing really hardened in that side of the business, which will probably draw capacity from the mortgage insurers.

So when you – so the cost of reinsurance is going up to, so when you talk about cost to capital going up, slowing economy, elevated HPA and probably, Mark, more of a normalized credit environment. If we're going to hold to 12% to 15%, longer-term returns, pricing just needs to come up. It's kind of simple math. We are – we do have some support with higher investment yields. But our view, pricing has to come up.

We kind of lag the market in the third and fourth quarter of last year, even in the first quarter of this year. And we kind of said we're a proxy for the market. We thought the pricing had gotten a bit too low as far as we're concerned. It's clearly has come up. I think that was reflected in the second and third quarters. Our share has gone up and we've raised pricing. We raised it in the second quarter. We did a couple additional raises in the third quarter. And given where we are with share, I wouldn't be surprised to see us raise it again in the fourth quarter.

So I think when you kind of look at those base average premium rates, I think at some point you're going to want to see a four handle on that longer-term. It's going to take a while to get to that because of where the pricing's been. And the rest of the industry is clearly raising pricing, which I think is a good thing. But again, it's – even when you get past this Mark, I think you have to look at a normalized credit environment, where we historically have said 2% to 3% claim rates, and it's been obviously below 1%.

So absent just all the other issues that we talked about, which were probably shorter-term in nature in terms of the economy, but longer-term 2% to 3% claim rates would argue for higher pricing. And again, to achieve those type of returns, if we don't have that pricing, then the industry is going to – it's going to be harder for the industry to maintain that 12% to 15% range.

[10] See https://seekingalpha.com/article/4553218-essent-group-ltd-esnt-q3-2022-earnings-call-transcript.

Enact[11]

Rohit Gupta

...

A key aspect of our growth and risk management strategy is our commitment to pursue high-quality business priced to maximize our returns on a risk-adjusted basis. With the increasing economic uncertainty, industry pricing trended upwards during the quarter and we implemented selective increases to adjust our pricing to reflect our view of the risk attributes of certain segments and geographies. In fact, we have continued these actions into the fourth quarter.

Overall, we remain confident in our ability to write new business that delivers attractive risk-adjusted returns and creates value for our shareholders.

The credit quality of our portfolio continues to be strong. And while there have been some signs of slowing in the broader housing market, the environment remains favorable for our business.

…

Radian[12]

Mark DeVries

Okay. That's helpful. And then -- thanks for the comments on what you're seeing in pricing. Just curious, are you adjusting pricing in a manner just to support your target returns across all businesses? Or are you selectively increasing pricing in certain areas to try and avoid positive risk that you don't want to get?

Derek Brummer

Yes, this is Derek again. So in terms of pricing, we've been adjusting pricing upward broadly really in Q3 and into October. And so when we think about pricing, we are really looking at relative value. So when we look at that, for instance, if we see less relative value, we'll adjust pricing up more.

So as we kind of look at the pricing, we adjusted pricing up more on the below 680 FICO, some of the layered risk segments, but certainly take into account increased macroeconomic uncertainty, potential for home price changes.

And so I would say, generally, what we've seen, I think, overall in the industry is pretty broad-based changes, some areas a bit more than others. I think some moving faster than others. I think we've probably been a bit more aggressive than the market overall in terms of our pricing changes, particularly in the latter half of Q3. And so as we think about Q4, we would expect to see a decrease probably in our NIW market share in light of that.

[11] See https://seekingalpha.com/article/4553735-enact-holdings-inc-act-q3-2022-earnings-call-transcript.

[12] See https://seekingalpha.com/article/4553004-radian-group-inc-rdn-q3-2022-earnings-call-transcript.

MGIC[13]

Mark DeVries

Okay. Thank you. Tim, I know you don't like to talk about pricing, but could you just talk kind of directionally how you are thinking about pricing here just given some of the macro uncertainties and also some of the pressure we are seeing on home prices here? And also kind of any observations you have made about what competitors are doing?

Tim Mattke

Yes. Mark, I appreciate the acknowledgment that we don't like to talk about pricing. And I will answer your questions in the way that I think is hopefully responsive for you. I think about deploying capital and the returns were required to get off of that in an environment where there is more uncertainty and more potential expectation for losses. You need to make sure that you can price accordingly to do that. I think we continue to remain focused on return expectations, and the environment that we are operating is obviously influences that. So, feel really good about the business we wrote this quarter. As we look forward, we will continue to adapt to what the environment is, but I would rather not comment on what we are seeing from competitors.

NMI[14]

Adam Pollitzer

…

We have been proactive doing even more through the year as the risk environment has evolved and took further steps to bolster our business in the third quarter and months since. We continue to increase policy pricing to reflect the evolving risk environment. We've made additional changes to further manage our mix of new business by risk cohort and geography, and we secured additional reinsurance protection and strengthened our PMIERs position.

…

More broadly, we have been encouraged by the discipline that we've seen across the private MI market. Underwriting standards remain rigorous and pricing has hardened in response to emerging risks. This is a time when Rate GPS and the broader adoption of rate engines across the mortgage insurance industry prove even more valuable. We have the ability to dynamically set our credit box and define our risk appetite and the flexibility to make the rate adjustments that we believe are appropriate in real time.

[13] See https://seekingalpha.com/article/4553012-mgic-investment-corporation-mtg-q3-2022-earnings-call-transcript.

[14] See https://seekingalpha.com/article/4551782-nmi-holdings-inc-nmih-q3-2022-earnings-call-transcript.

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