

PMI market trends and highlights: 4Q 2020

Continued strong NIW, accommodative borrower forbearance policies extended, focus on reserving and ultimate outcomes of delinquent inventory, and 2021 MILN issuances begin



Both purchase and refinance volume remained high in 4Q 2020—driving continued strong NIW. In addition, FHFA continues to be accommodative to borrowers by extending forbearance policies. These two trends contribute to IIF growth and gradual declines in the PMIs' delinquent inventories. The focus is now turning to forecasting the ultimate outcome of delinquent inventories and new notices of default (which remain slightly elevated from pre-COVID-19 levels). PMIs continue to transfer risk via capital markets mortgage insurance-linked notes and traditional reinsurance.

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

Milliman has compiled this data to build an aggregate view of the quarter in terms of NIW and performance data. 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 fourth quarter (4Q) 2020 earnings in February. This quarter continued to deliver historically high NIW for the industry, with many PMIs setting 4Q NIW records. In addition to the high volume, IIF performance improved, and the primary delinquency rate decreased for all the PMIs. During earnings calls, Milliman noted increased discussion with analysts on loss-reserving methodologies. These methodologies can shed light on a PMI's expectations of ultimate resolutions of the active delinquency inventory (reserve developments) as well as new notices (reserves for new defaults).

As of this publication, three of the six PMIs have issued capital markets insurance-linked notes (ILNs) transactions in 2021. Given the historically high 2020 NIW, and expectation for continued high 2021 NIW, we anticipate additional mortgage ILN issuance.

For 4Q 2020, this report provides a:

- Summary of trends in NIW
- Summary of IIF performance
- Summary of delinquent inventory, covering themes of:
 - Forbearance/foreclosure moratoriums
 - Loss reserving
- Summary of recent capital markets ILN issuances
- Appendix: Additional excerpts from earnings calls

Quarterly NIW results and IIF trends

SUMMARY OF QUARTERLY RESULTS

Low interest rates and strong purchase demand continues to lead to historically high NIW. Further contributing to the high NIW volume is the large share of conventional purchase mortgages that have private mortgage insurance. Since 2018, approximately 50% of conventional purchase mortgages have had PMI; in 2014, the share of conventional purchase mortgages with PMI was approximately 40%.¹

Looking across insurers, Milliman notes a larger degree of NIW variation, with respect to credit quality, purchase/refi mix, etc., after 2019 relative to prior to 2019. Note that, starting in 2019, there was generally industry-wide adoption of “black box” risk-based pricing engines.

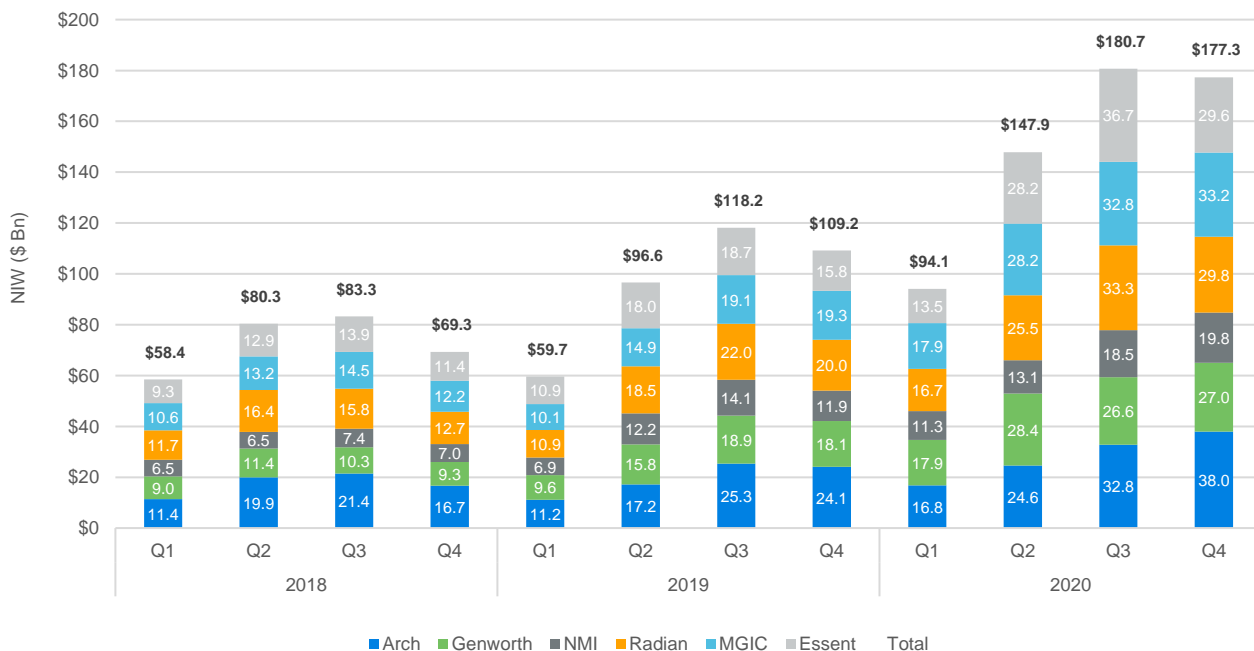
Growth in IIF is offset by fast prepayment speeds and, correspondingly, low policy persistency rates. The current low interest rate environment continues to provide a refinance incentive for a large percentage of existing policies in force—resulting in policy persistency rates at three-year lows.² This dynamic has led to only modest growth in insurance in force year-over-year and a large percentage of the PMIs’ insured portfolios being comprised of 2020-vintage loans. To the extent that interest rates continue to rise—the Freddie Mac 30-year FRM Primary Mortgage Market Survey rate is up 37 basis points (bps) from the 2021 lows³—persistency could also increase and increase the weighted-average life of 2020 vintage policies relative to prior vintages.

NIW VOLUME AND MARKET SHARE

Primary NIW in 4Q 2020 was \$177.3 billion, a decrease of 2% quarter-over-quarter and an increase of 62% year-over-year. This was comprised of \$119.8 billion of purchase mortgages (68%) and \$57.5 billion of refinance mortgages (32%).

Arch reported the largest market share in the quarter, writing \$38.0 billion (21.4%), followed by MGIC (\$33.2 billion, 18.7%), Radian (\$29.8 billion, 16.8%), Essent (\$29.6 billion, 16.7%), Genworth (\$27.0 billion, 15.2%), and NMI (\$19.8 billion, 11.2%).

FIGURE 1: QUARTERLY NEW INSURANCE WRITTEN, \$ BILLION BY PMI, 2018-2020



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

¹ Data from Milliman M-PIRe. See <https://www.milliman.com/en/products/milliman-m-pire>.

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

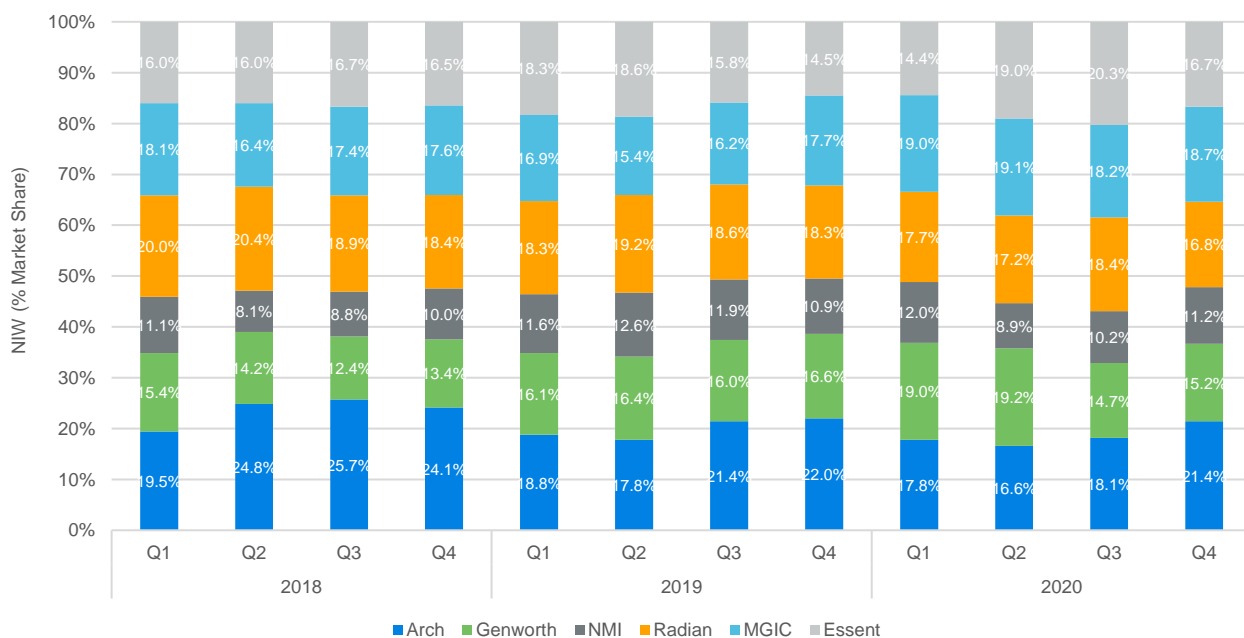
³ Freddie Mac (March 4, 2021). Mortgage Rates. Retrieved March 11, 2021, from <http://www.freddiemac.com/pmms/#>.

Primary NIW in full-year 2020 was \$600.0 billion, an increase of 56% over 2019 and an increase of 106% over 2018. This was comprised of \$395.5 billion of purchase mortgages (66%) and \$204.6 billion of refinance mortgages (34%). Relative to the aggregate high loan-to-value (LTV) mortgage market (i.e., high-LTV loans delivered to the government-sponsored entities (GSEs) and Ginnie Mae), the share of mortgages with PMI was approximately 43% in 2020, compared to 39% in 2019 and 43% in 2018⁴.

Arch reported the largest market share in the year, writing \$112.1 billion (18.7%), followed by MGIC (\$112.1 billion, 18.7%), Essent (\$107.9 billion, 18.0%), Radian (\$105.3 billion, 17.5%), Genworth (\$99.9 billion, 16.6%), and NMI (\$62.7 billion, 10.4%).

PMI market size expectations for 2021 varied among the PMIs, with general expectations of a modest decrease. If the 2021 market is in line with these estimates, 2021 will be the second-largest NIW market ever, with 2020 being the largest. Color provided on earnings calls by various PMIs: Essent: \$500 billion;⁵ MGIC: down 15% year-over-year⁶ (\$510 billion = [1 - 15%] * \$600); Radian: \$450 billion to \$500 billion.⁷

FIGURE 2: QUARTERLY NEW INSURANCE WRITTEN, % MARKET SHARE BY PMI, 2018-2020



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

INSURER-LEVEL NIW TRENDS

A theme of 2020 was more differentiation in NIW than prior years with respect to credit quality, purchase and refi mix, etc. Starting in approximately 1Q 2019, the industry shifted to primarily executing loan-level pricing via the PMIs' "black box" risk-based pricing engines, where PMIs can price by many granular credit attributes. With a risk-based pricing engine (as opposed to the more traditional "rate card"), the PMIs can change the pricing for loans meeting specific attributes with more agility than the old rate card pricing mechanism (where filing a new rate card would generally take much longer, there would be less pricing granularity, and resulting pricing changes would be more transparent to other participants). This pricing mechanism

⁴ GSE and Ginnie Mae acquisition data through October 2020. Accessed via Milliman M-PIRe. See <https://www.milliman.com/en/products/milliman-m-pire>.

⁵ "You're talking about over \$600 billion market maybe last year and our estimate this year is probably in the \$500 billion range." See <https://www.fool.com/earnings/call-transcripts/2021/02/19/essent-group-ltd-esnt-q4-2020-earnings-call-transc/>.

⁶ "[W]e expect to write approximately 15% less new insurance in 2021." See <https://www.fool.com/earnings/call-transcripts/2021/02/24/mgic-investment-corp-mtg-q4-2020-earnings-call-tra/>.

⁷ "[T]he private mortgage insurance market is expected to be approximately \$450 billion to \$500 billion" See https://www.radian.com/-/media/Files/Enterprise/Investor-Relations/Quarterly-Results/Transcripts/2020/2020_Q4_RDN_Transcript.pdf (PDF download).

allows the PMIs to more subtly tailor their risk appetite to particular segments of the market, which is likely playing a part in this trend. Looking at business mixture from 2018 to 2020, the data shows that the business written by the six PMIs is becoming less homogeneous—i.e., a quarter of NIW, compared across any two random PMIs, is likely less similar in 2020 than in 2018 and prior vintages.

The tables in Figures 3 to 5 summarize the makeup of the NIW written by the six PMIs with respect to FICO, LTV, and refinance concentration. Comparing the percentage of annual NIW with a particular characteristic across insurers (e.g., FICO less than 740) can provide perspective on the relative differences in loans insured. Note that pricing is not analyzed or considered in these summaries; to the extent that one PMI appears to be writing riskier loans, it is likely correspondingly charging higher premiums on those loans. If that premium is commensurate with the relative risk, writing riskier loans may not be inherently adverse, all else equal.

The percentage of NIW with a FICO score of less than 740, across the full PMI market, has fallen from 42.2% in 2018 to 35.4% in 2020. In 2018, the six PMIs were relatively homogeneous, with FICO concentrations less than 740 of 40.0% (NMI) to 44.4% (Radian). In 2020, the distance between the PMI with the lowest concentration of FICOs less than 740 and the highest concentration expanded, 25.5% (NMI) to 41.9% (Genworth).

FIGURE 3: PERCENTAGE OF ANNUAL NIW WITH FICO LESS THAN 740, BY PMI, 2018-2020

	Arch	Genworth	NMI	Radian	MGIC	Essent	Total Market
2018	43.5%	41.5%	40.0%	44.4%	40.6%	41.1%	42.2%
2019	40.6%	43.3%	34.7%	36.8%	37.3%	41.9%	39.3%
2020	35.6%	41.9%	25.2%	34.0%	34.5%	37.5%	35.4%

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

The percentage of NIW with an LTV ratio of greater than 90, across the full PMI market, has fallen from 60.3% in 2018 to 49.6% in 2020. In 2018, the six PMIs were relatively homogeneous with LTV concentrations greater than 90 of 58.2% (NMI) to 63.3% (Genworth). In 2020, the distance between the PMI with the lowest concentration of LTVs greater than 90 and the highest concentration expanded, 46.3% (Radian) to 54.5% (Genworth). Note that LTV is heavily correlated with the percentage of originations that are purchase versus refinance. In a refinance-heavy market, LTV ratios are generally lower, on average; in a purchase market, LTV ratios are generally higher, on average.

FIGURE 4: PERCENTAGE OF ANNUAL NIW WITH LTV GREATER THAN 90, BY PMI, 2018-2020

	Arch	Genworth	NMI	Radian	MGIC	Essent	Total Market
2018	59.7%	63.3%	58.2%	61.1%	59.3%	60.1%	60.3%
2019	55.0%	58.7%	54.6%	54.4%	57.4%	59.5%	56.6%
2020	50.8%	54.5%	47.4%	46.3%	48.4%	49.8%	49.6%

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

The percentage of NIW that was a refinance of a previous mortgage, across the full PMI market, has increased from 6.7% in 2018 to 34.1% in 2020. In 2018, the six PMIs were relatively homogeneous with refinance concentrations of 5.8% (Arch) to 8.2% (Essent). In 2020, the distance between the PMI with the lowest concentration of refinances and the highest concentration expanded, 27.7% (Arch) to 39.5% (Essent).

FIGURE 5: PERCENTAGE OF ANNUAL NIW, REFINANCES, BY PMI, 2018-2020

	Arch	Genworth	NMI	Radian	MGIC	Essent	Total Market
2018	5.8%	6.8%	7.6%	6.0%	6.8%	8.2%	6.7%
2019	21.8%	19.4%	17.1%	18.9%	19.1%	19.6%	19.5%
2020	27.7%	32.7%	33.6%	35.3%	35.6%	39.5%	34.1%

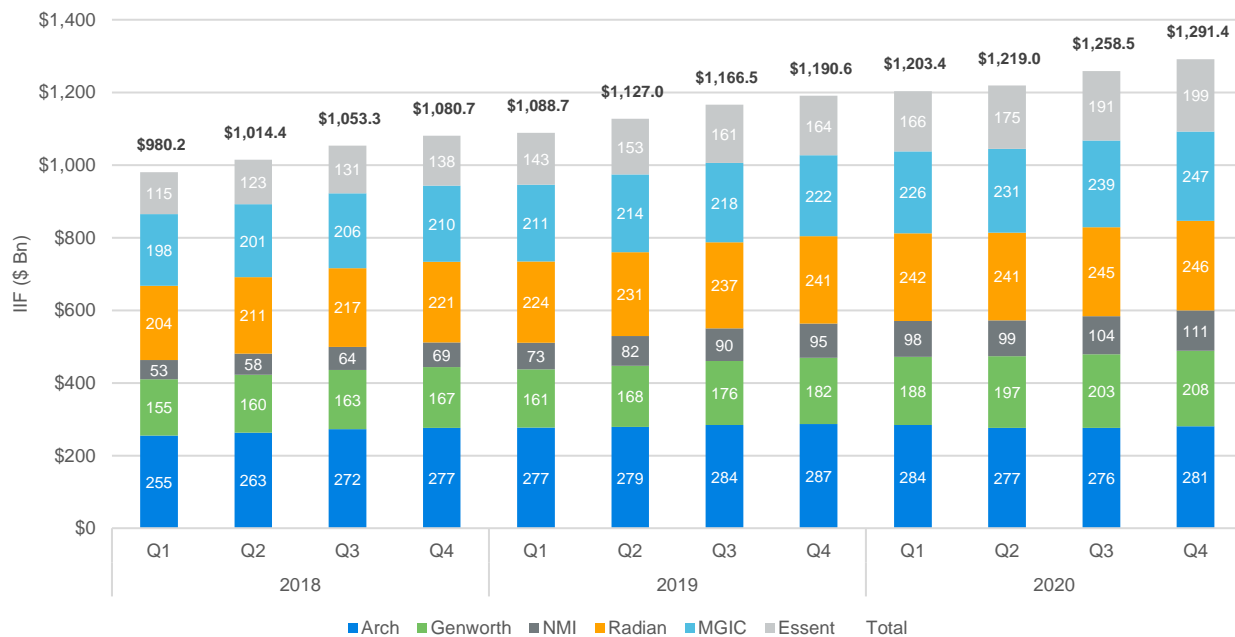
Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

MARKET-LEVEL IIF TRENDS

Despite the industry writing \$600.0 billion NIW in 2020, insurance in force (IIF) grew only \$100.8 billion, or 8%, over 2019. This is compared to calendar year 2019, where the industry wrote \$383.6 billion while growing IIF by \$109.9 billion, or 10%, over 2018.

With \$600.0 billion NIW in 2020 and the year-end 2020 market IIF of \$1,291.4 billion, a large percentage of the PMIs' IIF is comprised of 2020 vintage loans.

FIGURE 6: REPORTED INSURANCE IN FORCE, BY QUARTER, 2018-2020



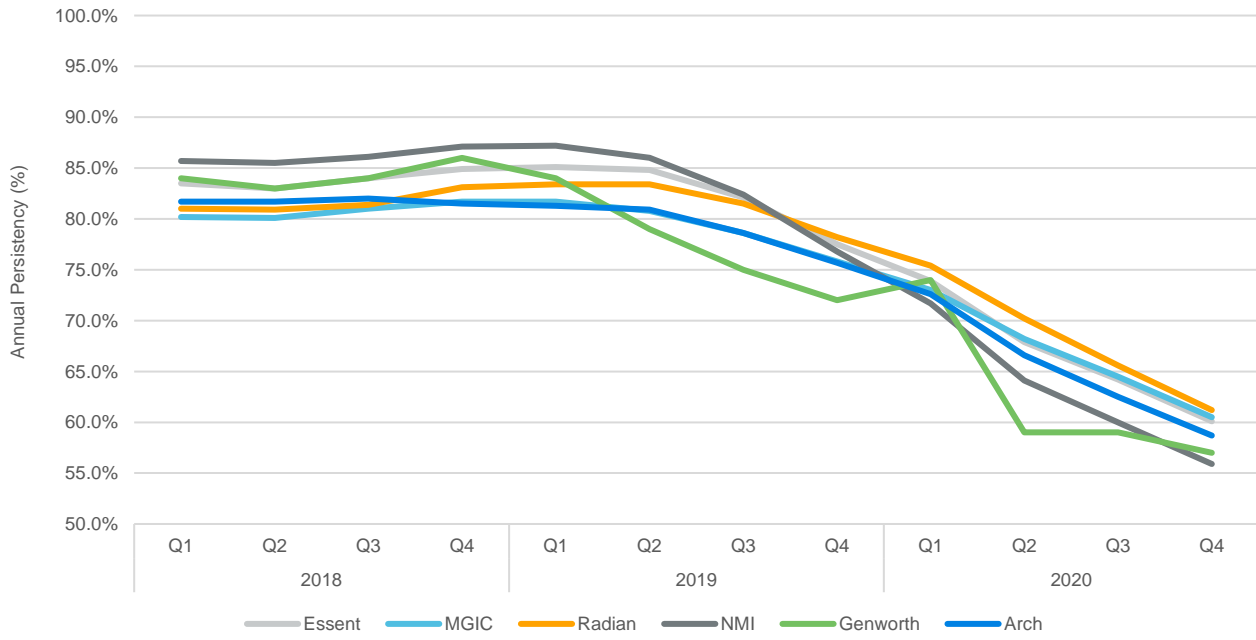
Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

IIF growth was muted compared to NIW volume due to the low persistency rate on existing policies over the year. Persistency is generally defined as the percentage of IIF that remained in force after the trailing 12-month period (e.g., for 4Q 2020, the rate would reflect the percentage of IIF that started 2020 that is still in-force to end 2020). While low interest rates and a strong purchase market drive NIW, they also decrease persistency—via borrowers refinancing out of PMI, borrowers refinancing while still needing PMI (i.e., the loan can still be recaptured via NIW, but will also count toward the attrition of the in-force book via decreased persistency), and, to a lesser extent, borrowers moving to new homes (housing turnover). Reported persistency rates across the six PMIs have generally been decreasing since early 2019 and now sit at three-year lows.⁸ To the extent that interest rates continue to rise—the Freddie Mac 30-year FRM Primary Mortgage Market Survey rate is up 37 bps from the 2021 lows⁹—persistency could also increase and increase the weighted-average life of 2020-vintage policies relative to prior vintages.

⁸ Milliman began tracking PMI quarterly performance in 1Q 2018.

⁹ Freddie Mac, op cit.

FIGURE 7: ANNUAL PERSISTENCY RATES, % OF IIF REMAINING IN FORCE AFTER THE TRAILING 12-MONTH PERIOD, BY QUARTER, 2018-2020



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

Forbearance, delinquent loans, and loss reserving

Since the onset of the COVID-19 pandemic, the GSEs, in collaboration with their regulator, the Federal Housing Finance Agency (FHFA), have instituted accommodative forbearance policies and foreclosure moratoriums to aid borrowers struggling with the economic impact of COVID-19 and government-related economic shutdowns. Most recently FHFA announced extensions of these policies through June 30, 2021—borrowers currently covered under a forbearance policy may also be eligible for an additional six-month extension, bringing the total allowable time in forbearance to 18 months.¹⁰

These borrower relief programs are generally positive for the PMI industry as the policies provide borrower relief and reduce the likelihood of claims for delinquent borrowers. Each month foreclosure is delayed (due to both forbearance or foreclosure moratoriums), the borrower has more time to recover economic footing and begin making payments on the loan. Furthermore, the GSEs are offering a COVID-19 payment deferral program that, upon exiting forbearance, allows borrowers to become current and defer repayment of the missed payments until the time the home is sold, refinanced, or at mortgage maturity. It is similar to the Partial Claim loss mitigation program of the Federal Housing Administration (FHA). These policies make claims less likely, all else equal. Lastly, in addition to the government-mandated borrower support, the transition rate from delinquency to claim is expected to be lower, all else equal, given recent positive home price appreciation and supply/demand dynamics in the market.

Nevertheless, the PMIs continue to have elevated delinquency inventories. They reported a high level of incurred losses in 2Q 2020 due to the wave of initial COVID-19-related delinquencies. However, the loss reserve per loan was generally lower for these delinquencies versus a vanilla pre-COVID-19 delinquency due to the extenuating circumstances—i.e., the PMIs assumed a larger percentage of these delinquencies would cure due to the temporary nature of the economic disruptions and the accommodative borrower support mandated by the government. Now that those loans have seasoned one or two quarters, earnings calls showed a renewed focus from Wall Street analysts on the level of loss reserves on these delinquencies (i.e., have the original assumptions proved accurate, or should they be adjusted in some way?). It is too early to accurately make a call as the forbearance period has been extended, and there have been limited forced exits from forbearance. There have been voluntary exits from forbearance, yet a large portion remains of loans 90-plus days delinquent and in COVID-19-related forbearance.

Cures have outpaced new notices of default, resulting in an aggregate decline in the delinquent inventory. However, the new notice rate remains above pre-COVID-19 levels, indicating that there is still some additional economic strain on borrowers due to the pandemic. On new notices of default, the reserving methodologies seem to differ between the PMIs more significantly than in quarters prior; some PMIs are returning to their pre-COVID-19 methodologies (with higher default-to-claim roll rate assumptions than were used for notices in 2Q 2020 and 3Q 2020) and some are continuing with their COVID-19 methodologies (with lower default-to-claim assumptions than pre-COVID-19). The end of this report provides earnings call highlights containing additional context on the loss reserving practices of the PMIs. The assumptions made by the PMIs can provide insight into their expectations for future paid losses on the current delinquent inventory.

COVID-19 FORBEARANCE AND FORECLOSURE MORATORIUM

As the PMIs reported earnings in February, accommodative government-mandated forbearance policies and foreclosure moratoriums to aid borrowers struggling with the economic impact of COVID-19 were being extended. On February 9, FHFA announced an extension to March 31, 2021, and the potential for an additional three months of forbearance, bringing the potential to 15 months.¹¹ Shortly thereafter, on February 16, the Biden administration announced a further extension for government mortgages (i.e., Ginnie Mae loans) to June 30, 2021, and the potential for an additional six months of forbearance, bringing the potential to 18 months. On February 25, with the GSE and Ginnie Mae policies now inconsistent, FHFA further extended the GSE policies to June 30, 2021, and added the potential for an additional three months of forbearance—bringing the potential forbearance period to 18 months.¹² This generally aligned GSE policy with the Ginnie Mae policy.

¹⁰ FHFA (February 25, 2021). FHFA extends COVID-19 forbearance period and foreclosure and REO eviction moratoriums. News release. Retrieved March 11, 2021, from <https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Extends-COVID-19-Forbearance-Period-and-Foreclosure-and-REO-Eviction-Moratoriums.aspx>.

¹¹ FHFA (February 9, 2021). FHFA extends foreclosure and REO eviction moratoriums and COVID forbearance period. News release. Retrieved March 11, 2021, from <https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Extends-Foreclosure-and-REO-Eviction-Moratoriums-and-COVID-Forbearance-Period.aspx>.

¹² FHFA extends COVID-19 forbearance period, op cit.

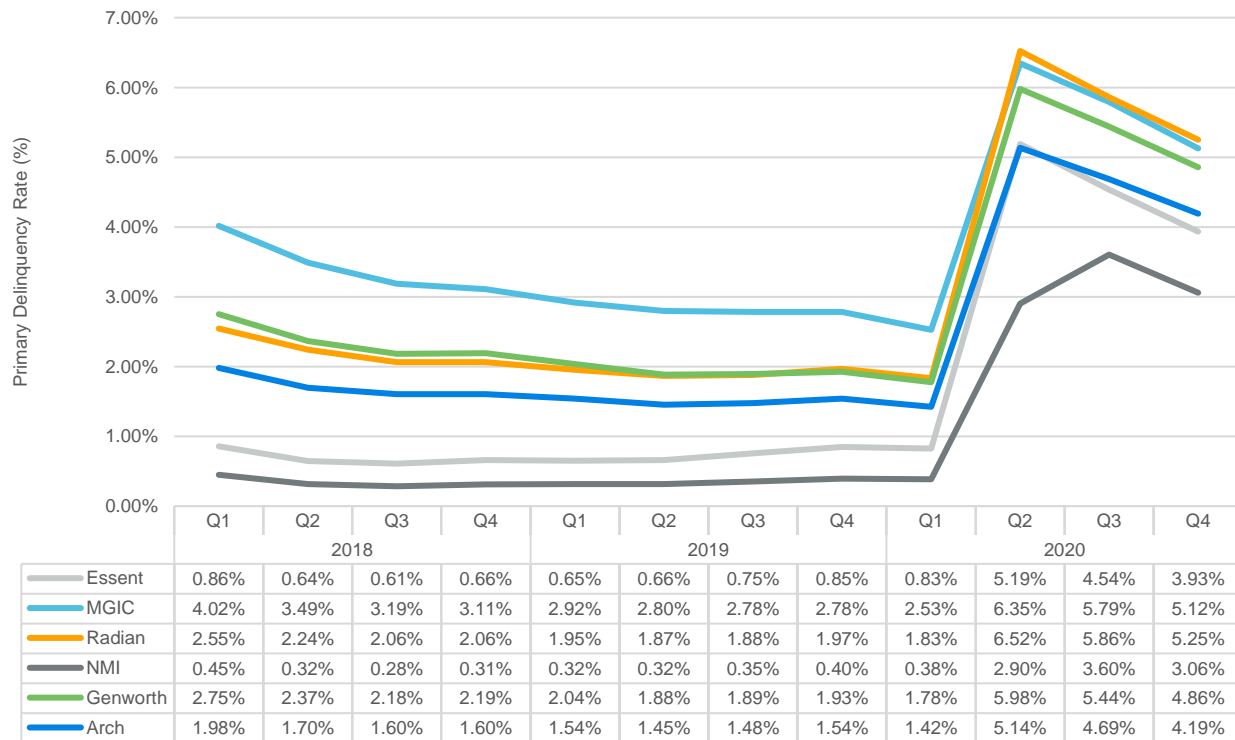
As stated above, these policies should be positives for the industry, all else equal, and increase the likelihood of benign outcomes from active delinquent loans.

DELINQUENT INVENTORY TRENDS

Given that loans in forbearance are still treated as delinquent when mortgage servicers report performance, the PMIs received large increases in new notices of default (“new notices”) in 2Q 2020, resulting in a sudden jump in the primary delinquent inventory of the PMIs. Since the peak in 2Q 2020, delinquencies have ticked down in 3Q 2020 and 4Q 2020, but still remain elevated versus pre-COVID-19 levels.

The charts in Figure 8 displays rates that influence the primary delinquency rate, e.g., new notice rate, cure rate, and paid claim 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 due to cures outpacing delinquencies, or, if it could be driven by little changes in the delinquent inventory and thus simply a rise in policies in force, decreasing the rate relative to the population).¹³

FIGURE 8: QUARTERLY PERCENTAGE OF IIF IN DELINQUENCY, % OF ENDING POLICIES IN FORCE, COUNT-WEIGHTED, BY PMI, 2018-2020

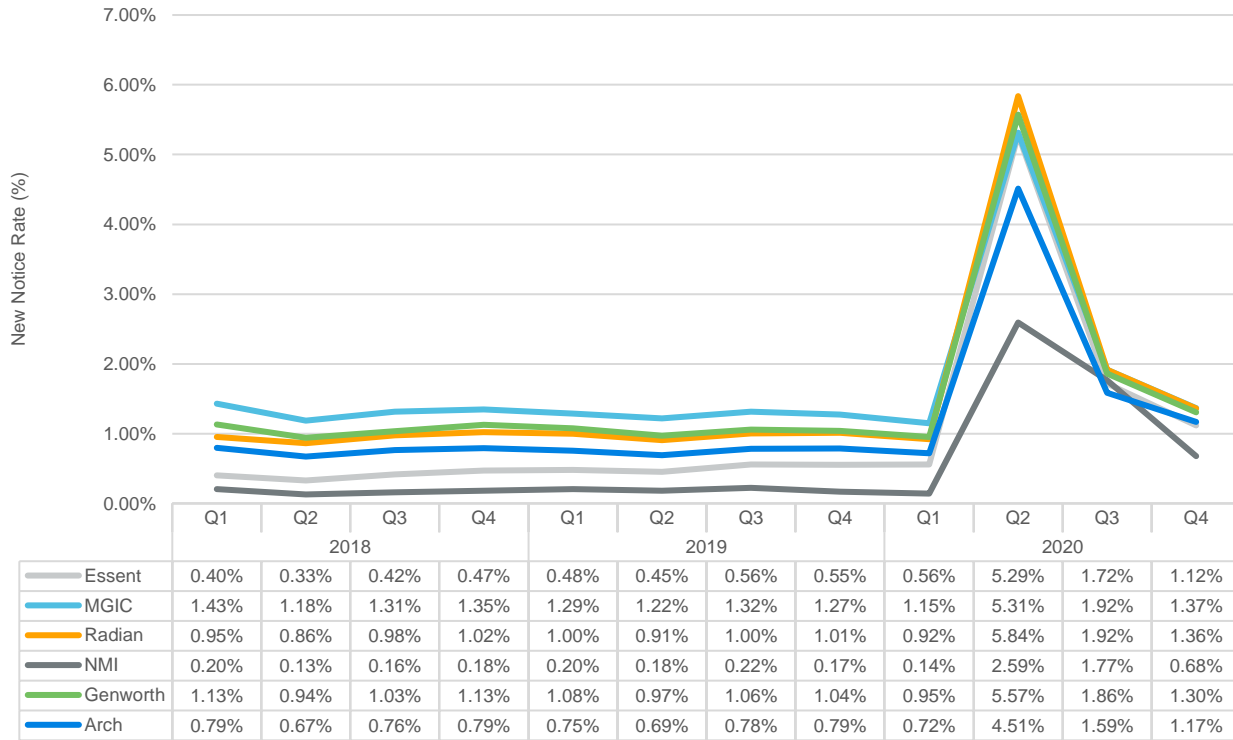


Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

¹³ 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 average¹⁴ primary delinquency rate decreased from 5.35% in 2Q 2020 to 4.40% in 4Q 2020. During this time, the new notice of default rate decreased from 4.85% to 1.17%. However, the 4Q 2020 new notice rate of 1.17% remains above the 1Q 2020 rate of 0.74%. To the extent that the economic recovery stalls and the elevated new notice levels persist (or begin to rise again), upward pressure may remain on the primary delinquency rate.

FIGURE 9: QUARTERLY NEW NOTICE OF DEFAULT RATE, % OF STARTING POLICIES IN FORCE, COUNT-WEIGHTED, BY PMI, 2018-2020

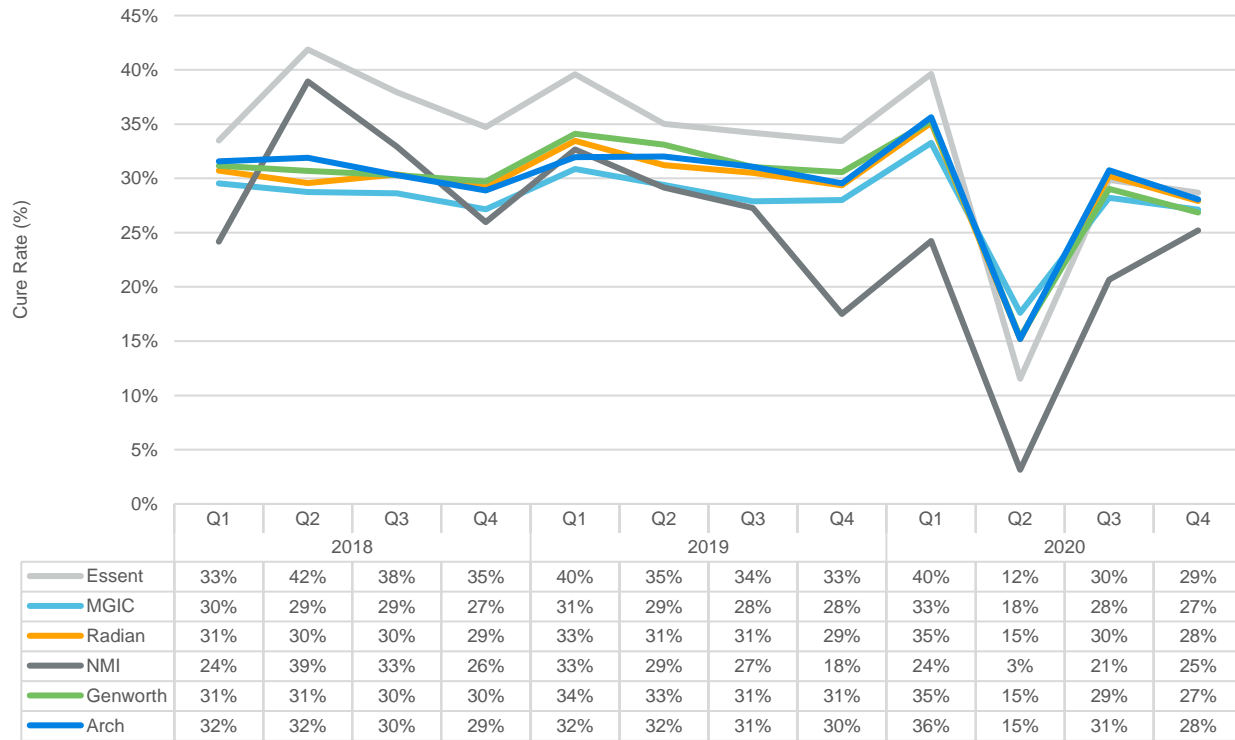


Source: PMI Earnings Releases, Financial Supplements, and 10-K/Qs.

The average cure rate was just 13% 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. Since that low, the cure rate has recovered to 27% in 4Q 2020. However, this remains below the pre-COVID-19 average cure rate of 31% (1Q 2018 through 1Q 2020). Given that the majority of active delinquencies are subject to a COVID-19-related forbearance plan (which, discussed above, have recently been extended), it is likely that the depressed cure rate is a result of these assistance programs, giving borrowers the ability to remain in forbearance while the economy recovers, thus causing the delinquencies to persist longer, all else equal.

¹⁴ Averages in this section are calculated as the simple average of the six PMIs' rates in the tables provided.

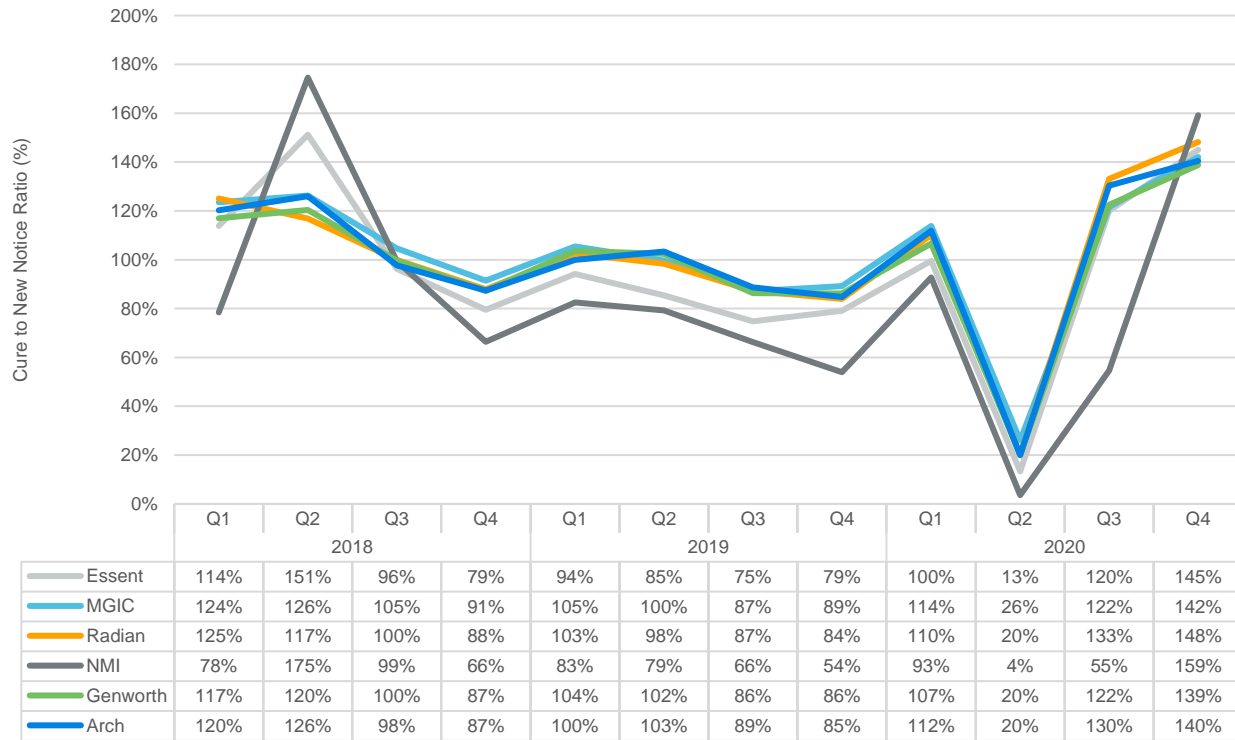
FIGURE 10: QUARTERLY CURE RATE, % OF STARTING DELINQUENCIES PLUS NEW NOTICES, COUNT-WEIGHTED, BY PMI, 2018-2020



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, recissions, and denials, a ratio over 100% indicates a net decrease in the delinquent inventory over the quarter. In 3Q 2020 and 4Q 2020, despite previously showing new notice rates and cure rates that still underperformed versus pre-COVID-19 levels, cures still outpace new notices, leading to a decrease in the default inventory. The average cure to notice ratio in 4Q 2020 was 146%—indicating that, during the quarter, approximately three loans cured from the delinquent inventory for every two that entered. This, coupled with increases in the number of policies in force, led to a decline in the primary delinquency rate, as a percentage of policies in force.

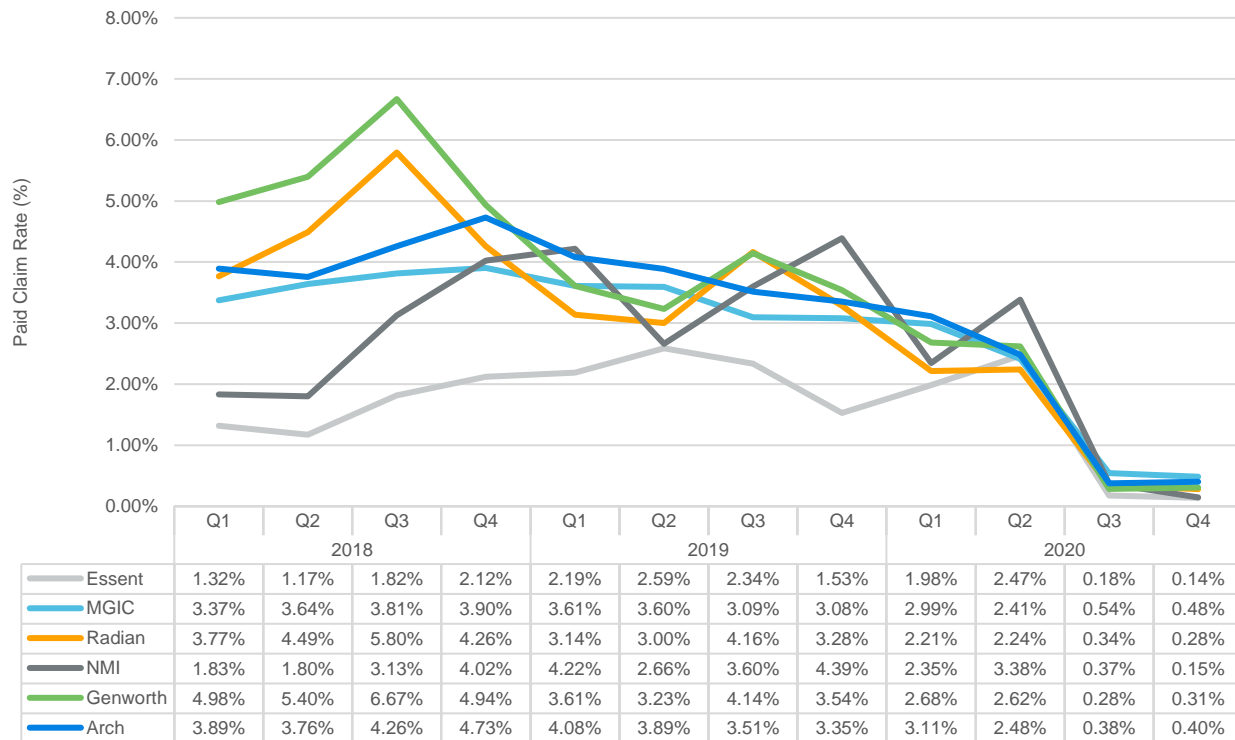
FIGURE 11: QUARTERLY CURE TO NEW NOTICE RATIO, CURE COUNT DIVIDED BY NEW NOTICE COUNT, BY PMI, 2018-2020



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

Lastly, the foreclosure moratoriums, highlighted above, have reduced the number of paid claims versus pre-COVID-19 levels. 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 have directly reduced the PMI claims paid. To the extent the foreclosure moratoriums are lifted, and delinquent borrowers are not able to cure the delinquency via the available modification options, there may be a glut of claims paid in future quarters.

FIGURE 12: QUARTERLY PAID CLAIM RATE, % OF STARTING DELINQUENCIES, COUNT-WEIGHTED, BY PMI, 2018-2020



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

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 are reflective of the current delinquency episode. The PMIs estimate the liability for losses related to the outstanding delinquent inventory and establish that amount as loss reserves. This estimation is typically done by projecting the percentage of loans in the delinquent inventory that will result in a claim payment (i.e., claim rate), and multiplying the claim rate by the estimated dollar amount per claim (i.e., claim severity). The underlying claim rate and claim severity estimates are generally based on historical experience. However, as with any model or estimate, a degree of judgment is baked into the results. In the PMIs' 10Ks and 10Qs filed with the U.S. Securities and Exchange Commission (SEC), there is generally a passage with caveats around loss reserves; e.g., the actual ultimate claims paid may be materially different from the loss reserve estimates. Despite the uncertainties around the figure, investigating trends and changes in loss reserves can provide insight into how the PMIs view the likely ultimate outcomes on the current delinquent inventory.

Changes in loss reserves within a quarter are generally attributable to two reasons: (1) reserve development, i.e., an increase or decrease of loss reserves of previously delinquent loans as a result of the re-estimation of losses, and (2) reserves on new notices, i.e., reserves established on loans that become delinquent in the quarter.

In the quarter there was relatively more discussion on loss reserving assumptions on new notices than discussion of reserve development.¹⁵ On new notices, the claim severity is generally more easily estimated than the claim rate. There is typically less variation in severity across time and recent severity on paid claims can be used as a reasonable proxy, so the majority of the discussion on reserving for new notices in the quarter was surrounding the claim rate assumption (also referred to as the "incidence" or "default-to-claim" assumption). In this quarter, in particular, there was a renewed focus on the claim rate

¹⁵ However, there was some reserve development reported by PMIs. See Genworth, in the Appendix, for example.

assumption as it seemed as though assumptions were relatively more inconsistent among the PMIs than in previous quarters. PMIs and investors generally discussed whether the current quarter's reserving was more consistent with pre-COVID-19 "normal" practices, or whether it was the COVID-19 forbearance delinquencies in 2Q 2020 and 3Q 2020, which were generally reserved for using a lower claim rate, given the expectation for better-than-normal performance because of the forbearance policies and accommodative exit options provided by the GSEs.

FIGURE 13: CLAIM RATE ASSUMPTION ON NEW NOTICES, BY PMI, 3Q 2020-4Q 2020

	Arch	Genworth	NMI	Radian	MGIC	Essent
3Q 2020	8-9%	<7% ¹⁶	7%	8.5%	8%	7%
4Q 2020	9.4%	7%	7%	8.5%	7.5%	9%

Source: PMI Earnings Call Transcripts and Releases.

Figure 13 displays the claim rate assumptions used for new notices over the past two quarters. These values were populated via managements' statements during the PMIs' 3Q 2020 and 4Q 2020 earnings calls. The salient sections of the earnings calls are reproduced in the Appendix.

The claim rates stated by the six PMIs ranged from 7% (NMI and Genworth) to 9.4% (Arch). A 7% claim rate can be interpreted because, of the new notices of default received in the quarter, 7% are assumed to claim on the current delinquency episode, while the other 93% are assumed to return to performing status. Note that these assumptions are specific to this new notice instance; in other words, the 93% "cure" portion is not implying a benign ultimate outcome on all 93% of the cures, the loan may subsequently redefault, but in that instance a new reserve would be established at that time. Essent's claim rate assumption stood out as they reverted to their "pre-COVID-19 reserve methodology," resulting in a 9% claim rate versus 7% in 3Q 2020. Genworth did not provide specific numeric claim rate guidance in prior releases but, given it reported reserve strengthening on COVID-19-related delinquencies, it appears that the claim rate assumption in 3Q 2020 was less than 7% originally. Thus, its current 7% assumed rate appears to also be increased from prior estimates.

In future iterations of this report—as the glut of COVID-19-related delinquencies continue to remain active, transition to cure, or result in a paid claim—Milliman will report on significant changes to loss reserves as long as the estimates are disclosed or discussed in the PMI quarterly reports or transcripts. This data can indicate changes in PMIs' expectations of future loan performance.

¹⁶ After revision (reserve strengthening) reported in the quarter, this figure is 7%.

Risk transfer: Capital markets ILN issuances

After overcoming financial market disruptions caused by the rapid spread of and response to COVID-19, the PMI insurance-linked notes (ILN) new issuance market returned in the second half (2H) of 2020, with 10 transactions in 2H 2020 and two completed transactions in 2021 to date.

Figure 14 provides a summary of PMI capital markets ILN issuances in 2020 and 2021. Row 2 indicates whether a vertical slice of all or part of the structure was executed via the reinsurance market in tandem with the bond offering.

FIGURE 14: PMI CAPITAL MARKETS ILN TRANSACTIONS, 2020-2021 TO DATE

	Essent RMIR 20-1	Radian EMIR 20-1	Arch BMIR 20-1	NMI OMIR 20-1	Arch BMIR 20-2	Essent RMIR 20-2	Genwith TMIR 20-1	Radian EMIR 20-2	MGIC HMIR 20-1	NMI OMIR 20-2	Arch BMIR 20-3	Arch BMIR 20-4	MGIC HMIR 21-1	Genwith TMIR 21-1
Settle Date	1/30	2/3	6/30	7/30	9/3	10/8	10/22	10/23	10/29	10/29	11/3	12/22	2/2	3/2
ILN Reinsurance Co-Participation?	Yes	No	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No
Total Bonds Issued (\$M)	496	488	450	322	423	399	350	390	413	242	418	321	399	495
Coverage Attachment Point %	2.25	2.05	7.50	2.50	3.50	3.50	3.50	3.25	3.00	2.00	2.50	1.85	2.25	1.50
Coverage Detachment Point %	8.00	7.00	12.50	7.25	9.75	6.50	7.00	6.25	7.50	6.00	9.00	6.00	6.50	5.00
Min CE %	9.00	8.00	13.50	8.00	10.75	7.50	8.00	7.25	8.50	6.25	10.00	6.00	7.50	6.50
WA Spread (bps)	189	185	320	619	467	506	476	482	419	466	406	346	235	333
Term (yrs)	10	10	10	10	10	10	10	10	10	10	10	9.5	12.5	12.5
Optional Call (yrs)	7	7	7	7	7	7	7	7	7	7	7	5	7	5

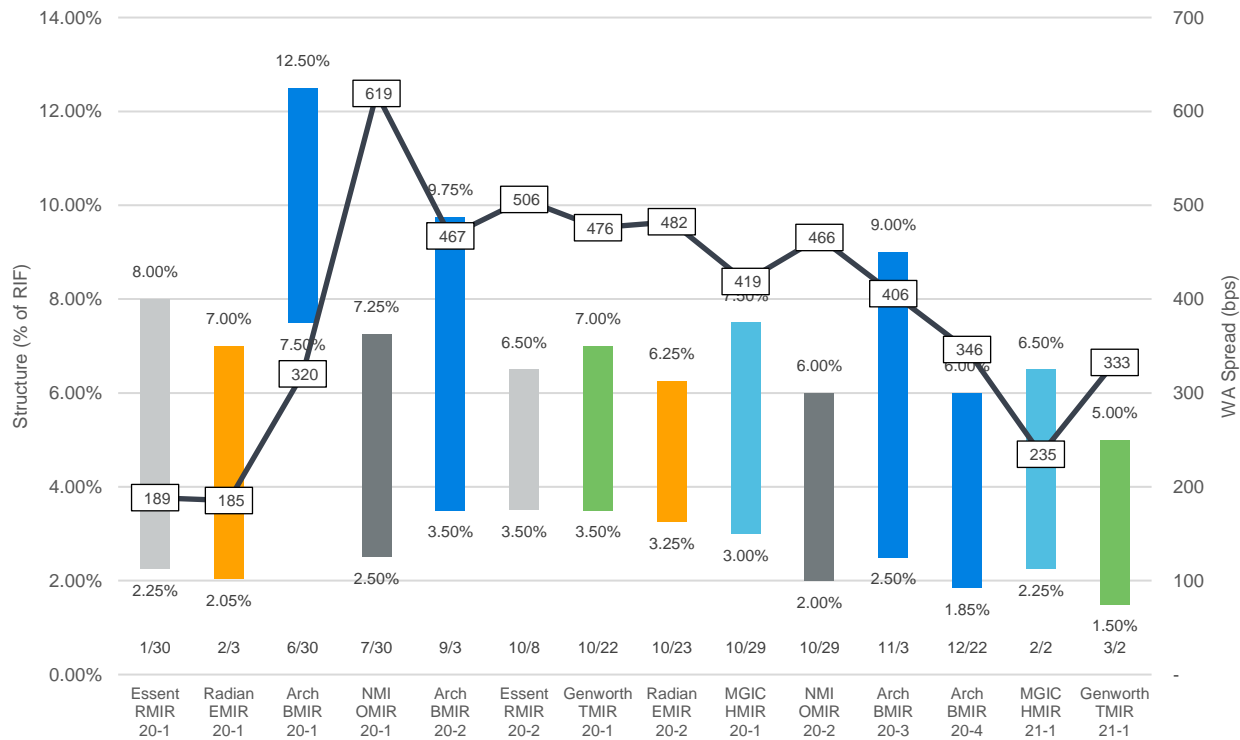
Source: Bloomberg, DBRSMorningstar, Moody's.

Prior to the COVID-19-related financial market disruptions, Essent and Radian executed 20-1 capital markets ILNs (the Essent transaction had a reinsurance co-participation). These transactions had some of the tightest ILN spreads to date with weighted average (WA) spreads of 189 and 185, respectively. Early 2019 ILNs priced with a WA spread of between 244 and 297. Early 2021 spreads are approaching the early 2020 spreads (HMIR 21-1 at 235).

The COVID-19 pandemic outbreak caused disruptions to the ILN market with investors' loss expectations increasing significantly and bond values decreasing precipitously. It was not until late 2Q 2020 and early 3Q 2020—when the impacts of COVID-19 on the housing market were better understood—that investor appetite for this product came back.

Across the 12 completed post-COVID-19 ILN issuances, the bond issuance amount varied from \$242 million to \$495 million. The WA spread has generally continued to compress post-COVID-19-disruption with the most recent MGIC HMIR 21-1 transaction nearing the pre-COVID-19 lows. Figure 15 visually displays coverage attachment and detachment points along with the WA spread for the transactions.

FIGURE 15: PMI CAPITAL MARKETS ILN TRANSACTIONS, 2020 TO DATE (BARS – CEDED RISK, LINE – WA SPREAD)



Source: Bloomberg, DBRSMorningstar, Moody's.

Since last publication, Arch BMIR 20-4, MGIC HMIR 21-1, and Genworth TMIR 21-1 have been issued. BMIR 20-4 was linked to the same reference pool as BMIR 20-1. Given that BMIR 20-1 was the first transaction executed after the COVID-19 disruption, coverage was obtained for more risk-remote tranches to entice investors to reopen the market. BMIR 20-4 places coverage beneath 20-1, now that market conditions and pricing make it more attractive, as a complement to the original deal.

HMIR 21-1 was the most consistent with a vanilla “on-the-run” MILN issuance, with the reference pool having coverage effective dates from August 2020 to December 2020. The term was extended to 12.5 years, while the call option remained at 7 years. Prior MILNs had terms of 10 years. This extension to 12.5 years could possibly coincide with the expectation for increased persistency of the 2020 vintage.

TMIR 21-1 was supported by a reference pool of seasoned collateral with a weighted average loan age of 40 months. Furthermore, the structure attachment of 1.50% was lower than MILNs of the past. Lastly the deal was the largest (\$495 million) since the beginning of 2020 (RMIR 20-1 at \$496 million in January 2020). Similar to the HMIR deal, the TMIR deal also featured a 12.5-year term. Furthermore, it featured a shorter 5 year call option. Milliman will continue to track deal terms and option execution dates, for potential further changes in future issuances.

During finalization of this publication, Arch was marketing BMIR 2021-1 which was anticipated to be larger than prior recent ILNs (\$660+ million)¹⁷.

The reference pools for these transactions ranged from 100,000 to 315,000 loans with risk in force (RIF) of \$6 billion to \$15 billion.

¹⁷ Source: Bloomberg, DBRSMorningstar

FIGURE 16: PMI CAPITAL MARKETS ILN TRANSACTIONS, REFERENCE POOL CHARACTERISTICS, 2020-2021 TO DATE

	Essent RMIR 20-1	Radian EMIR 20-1	Arch BMIR 20-1	NMI OMIR 20-1	Arch BMIR 20-2	Essent RMIR 20-2	Genwth TMIR 20-1	Radian EMIR 20-2	MGIC HMIR 20-1	NMI OMIR 20-2	Arch BMIR 20-3	Arch BMIR 20-4	MGIC HMIR 21-1	Genwth TMIR 21-1
Number of Loans (K)	145	156	163	101	118	244	221	196	191	88	112	131	195	314
UPB (\$B)	38.0	40.0	43.7	30.6	32.3	68.4	59.9	54.5	52.4	30.8	31.2	33.3	55.0	61.5
RIF (\$B)	9.6	9.9	10.6	6.8	7.2	13.3	14.9	13.0	9.2	6.1	7.0	8.1	9.4	14.1
WA Coupon (%)	4.42	4.32	3.88	3.87	3.54	3.58	3.46	3.55	3.48	3.21	3.17	3.87	3.00	4.20
WA FICO	743	748	747	756	749	748	746	753	752	763	751	747	751	744
WA LTV (%)	92.4	92.3	91.3	91.5	90.9	91.4	91.5	90.9	90.7	90.7	91.0	91.6	90.6	92.7
WA DTI (%)	37.5	37.0	36.1	34.3	35.0	35.9	36.5	35.4	35.1	33.0	35.3	36.0	35.0	36.2

Source: Bloomberg, DBRSMorningstar, Moodys.

EARNINGS CALL SUMMARY: ILN COMMENTARY

The Essent earnings call featured direct commentary on risk transfer execution differences between the reinsurance and capital markets:

Essent¹⁸

Phil Stefano – Deutsche Bank – Analyst

Okay. And one quick one on reinsurance coverage. Just getting back to business as usual, I didn't see anything that said the quota share was going to be renewed or extended for 2021 and forward, the external quota share. It feels like the premium yield guidance has that embedded in it. Any comment on that or is the quota share still in a work in progress?

Mark A. Casale – Chairman, President & Chief Executive Officer

Well, remember, the quota share is still -- it's still in place because the new business stopped getting ceded last year, but we'll still have a significant kind of ceded premium for 2021, which is kind of all baked in the premium guidance. And also, it was a little bit [Phonetic] reason why the expenses are lower too. So, I mean, there's a lot of moving parts there. I think for 2021 still, I think it remains to be seen. If you think about where the ILN market has really kind of come roaring back in terms of pricing, for us really, it's going to be best execution. So as we look at 2021, we will compare kind of ILN pricing to quota share. And quite frankly, last time we checked, the quota share pricing was a little wide, hasn't really come in. The reinsurers kind of pushing more of a hard market. That's not really where it is in the capital markets. So, again -- we'll look at it. So stay tuned, but I wouldn't -- in terms of just a ceding commission and premium, that's already kind of embedded in 2021 guidance.

¹⁸ See <https://www.fool.com/earnings/call-transcripts/2021/02/19/essent-group-ltd-esnt-q4-2020-earnings-call-transc/>.

Appendix: Additional excerpts from earnings calls

The below call highlights focus on loss reserving methodologies for new notices of default.

Arch¹⁹

Geoff Dunn – Dowling & Partners Securities LLC – Analyst

Thanks, good morning. A couple of questions on the MI; first of all, what was the incidence assumption for the current period provision, as well as the average severity factor this quarter?

Francois Morin – Chief Financial Officer and Treasurer

Yeah. So 9.4% for the new annuities in the quarter and the average reserve for DQ was a little bit over 5,000 pretty much in line with the third quarter Geoff, because the risk that came in was a little bit less coverage in this quarter. So that would explain the average being a bit lower or bit more in line.

Geoff Dunn – Dowling & Partners Securities LLC – Analyst

Okay. And so as you think about '20 or the first part of '21 there to my knowledge, they extended the forbearance period out 15 months. But you can't enter new forbearance activity. So what did you or provision for non-forbearance loans or your incidents assumptions for non-forbearance loans look like in the fourth quarter?

Francois Morin – Chief Financial Officer and Treasurer

Yeah, I don't think we -- we did not, the way we reserve, we sort of trying to make an overall all encompassing assessment and put that in that number. So I think that's what you might have said might have thought in the past. Our number could have been a bit higher. So we think that we have enough in the reserving in totality, the factors we've used.

Geoff Dunn – Dowling & Partners Securities LLC – Analyst

Okay. But with forbearance options going away, is it fair to assume that that incidence assumption will probably climb in the first half?

Francois Morin – Chief Financial Officer and Treasurer

Yeah. Geoff, we might, but we'll have to evaluate when we get there. I think you're right, I mean, you have to till February 28 to actually as for this -- be under the forbearance program. So we'll see how that develops. We had a surge in a couple of weeks of people asking for forbearance that might help again more, we'll have to readjust Geoff as we see the end of the quarter. We'll have another month of non-forbearance effective new, not new forbearance, we will have to reevaluate when we get there.

¹⁹ See <https://www.fool.com/earnings/call-transcripts/2021/02/11/arch-capital-group-ltd-acgl-q4-2020-earnings-call/>.

Genworth²⁰**Dan Sheehan – Chief Financial Officer and Chief Investment Officer**

...

In total, approximately 31,800 or 71% of our prior delinquencies are in forbearance. Our servicer reported forbearance trends continue to decline from peak levels in May 2020 and ended the fourth quarter with 5.4% or approximately 50,000 of our active primary policies reported in a forbearance plan, with 37% of those in forbearance still reported as current. During the quarter, we revised our estimated claim rates for previously reported delinquencies. The \$37 million pre-tax reserve increase in the quarter, primarily reflects our expectation that prior delinquencies and forbearance plans will have a higher claim rate than our initial best estimate, given the slower emergence of cures relative to our original expectations as well as the ongoing economic impact due to the pandemic.

With this adjustment, our current blended claim rate estimate for all COVID delinquencies or delinquencies since April that remain outstanding at year end is approximately 7%.

...

Geoffrey Dunn – Dowling & Partners – Analyst

OK. And then with respect to your comment on the reserve strengthening, I understand that the average is now up to 7%. Are you saying also that you're 7% in the fourth quarter? Or was it a higher number than 7% that brought up the average as well as the strengthening charge?

Rohit Gupta – President and CEO for Genworth's U.S. Mortgage Insurance Business

Yes. So Geoff, what I would say is we are in an unprecedented environment here when we just think about our overall roll rates and our reserve factors. The forbearance programs we have today are very different than the forbearance programs, we used to have pre-COVID. You are familiar with the numbers, less than 5% of our delinquent base used to be in forbearance programs.

And as Dan mentioned, right now, 71% of our delinquency at the end of the year are in forbearance programs. Essentially, what we did was, as we were navigating through the year, and we looked at cure rates coming from forbearance delinquencies. We did not see those cure rates navigating to the level that we would have expected based on the choice of roll rates we made earlier in the year. So based on that experience, we decided to increase primarily our forbearance roll rates, and the cumulative number came to 7% for all COVID delinquencies, forbearance and nonforbearance combined at the end of fourth quarter.

Geoffrey Dunn – Dowling & Partners – Analyst

Right. I'm asking, I guess, specifically, what was the assumption for Q4, though? What's kind of your run rate exiting the year? Are you at a 7% assumption, as we go into the beginning of the year? Or is it a higher number that helped bring up the overall average for the last nine months?

Rohit Gupta – President and CEO for Genworth's U.S. Mortgage Insurance Business

Yes. So we are at 7%, as we end the fourth quarter for COVID delinquencies. And for non-COVID delinquencies, that number would be higher because non-COVID delinquencies were non forbearance. And 7% for news as well.

Geoffrey Dunn – Dowling & Partners – Analyst

So your blended number is about 7%?

Rohit Gupta – President and CEO for Genworth's U.S. Mortgage Insurance Business

Yes.

²⁰ See <https://www.fool.com/earnings/call-transcripts/2021/02/17/genworth-financial-gnw-q4-2020-earnings-call-trans/>.

NMI²¹**Bose George – KBW – Analyst**

So. Okay, great. That's helpful. Thanks. And then, actually just a quick one on credit, I think, if you gave the default to claim assumptions. So, if not we get that, and then actually, just on the [Technical Issues].

Bradley M. Shuster – Executive Chairman of the Board

Bose, I'm sorry, I heard the first part of the question is, I'll answer it, but then I'll ask you to repeat the second part. I'm not sure our line broke up or yours did, but the claim rate assumption on new notices in the fourth quarter was approximately 7%, which is consistent with the claim rate assumption that we made on new notices in both the second and the third quarter. Would you mind repeating the second part of your question now?

...

Geoffrey Dunn – Dowling & Partners -- Analyst

Okay. As you think about the incidence assumption, my assumption has been that the incidence rates would go up at all the MIs as the percent of new forbearance loans with the new delinquencies coming in and goes down. If that is the trend in the coming year, and there's no macro change on your part, is it fair that, that incident assumption go up? Or are there other things we need to consider as we look at that outlook?

Adam Pollitzer – Executive Vice President and Chief Financial Officer

Yeah. So this is one where -- I do want to highlight, we're very happy to talk about the claim rate assumption, we call a frequency factor internally in the aggregate, but it is -- that's not how we developed it. We don't just apply a blanket 7% assumption for all new notices that come in, in a particular quarter or whatever the claim rates we would be disclosing at that point. It's very much developed based on the individual profile of the loan, the borrower and expectations for performance on a model basis. So every single one of those -- the 2,589 new defaults that came through in the quarter went through our risk model, got its own frequency factor, and it just happens to be that the average continues to run at 7%. Where that number trends in the future will depend greatly on both the macro environments in which we're incurring new defaults, but also the underlying risk profile of those defaulted borrowers.

Radian²²**J. Franklin Hall – Chief Financial Officer & Senior Executive Vice President, Radian Group Inc.**

The default to claim rate assumption on new defaults remained at 8.5% for the fourth quarter of 2020, unchanged from the third quarter of 2020 and an increase from 7.5% for the fourth quarter of 2019.

²¹ See <https://www.fool.com/earnings/call-transcripts/2021/02/17/nmi-holdings-inc-nmih-q4-2020-earnings-call-transc/>.

²² See https://www.radian.com/-/media/Files/Enterprise/Investor-Relations/Quarterly-Results/Transcripts/2020/2020_Q4_RDN_Transcript.pdf (PDF download).

MGIC²³**Nathan Colson – Executive Vice President and Chief Financial Officer**

...

Shifting over to credit. Net losses incurred in the fourth quarter were \$45.8 million compared to \$23.7 million for the same period last year. In the fourth quarter, we received approximately 15,000 new delinquency notices, which is approximately 10% more than the fourth quarter of 2019 but 27% fewer than last quarter and 74% fewer than the second quarter of 2020. The estimated claim rate on new notices received in the fourth quarter was approximately 7.5% compared to 8% in the fourth quarter of 2019. While new delinquency notices were higher in the fourth quarter of 2020 compared to the same period in 2019, the primary driver of the increase in losses incurred was the minimal loss reserve development in the fourth quarter of 2020 compared to \$24 million of favorable development in 2019. We also decreased our incurred but not reported, or IBNR, reserve in the fourth quarter of 2020 by \$7 million to approximately \$27 million compared to a decrease of \$3 million in the fourth quarter of 2019. To establish IBNR -- the IBNR reserve, we estimate the number of loans whose borrowers had missed a payment but that have not yet been reported to us as delinquent.

...

Giuliano Bologna – Compass Point -- Analyst

That makes a lot of sense. And part of what I was getting at was, obviously, that's your biggest indicator of whether or not your claim rate assumptions will be accurate, because there's 95% cured at the end of the term, a 7% claim rate would be off. But kind of leading up to that, is there any other information that you have or that you get from servicers that gives you an indication of why loans are rolling or extending for another three months, that can kind of factor into your credit methodology -- or your reserving methodology, I should say?

Michael J. Zimmerman – Senior Vice President, Investor Relations

Well, Giuliano, the last part -- This is Mike. I mean, to the reserving methodology, probably less so. Right? Because that's a pretty tried and true methodology and a pretty good and very consistent approach. But we do get information, but we don't get complete information on our portfolio for reasons for exiting the forbearance. So, we don't have real good visibility into the reasons. We can look at our -- on a portion of the portfolio, but not enough that we'd be willing to make any statements about as far as preponderance of how much is pre-pay versus deferral and so on of that nature. But we do -- as we look forward, we add part of it and it certainly informs our thinking when it comes about, but not necessarily the mechanics of reserving.

²³ See <https://www.fool.com/earnings/call-transcripts/2021/02/24/mgic-investment-corp-mtg-q4-2020-earnings-call-tra/>.

Essent²⁴**Lawrence E. McAlee – Senior Vice President, Chief Financial Officer**

...

The provision for losses and loss adjustment expenses in the fourth quarter was \$62 million compared to \$55 million last quarter and \$176 million in the second quarter of 2020. During the fourth quarter, we received 8,745 new default notices which is down 31% compared to 12,614 defaults reported in the third quarter and down 77% compared to 37,357 defaults reported in the second quarter. At year end, our default rate decreased to 3.93% from 4.54% at September 30 and 5.19% at June 30. As Mark mentioned, we have reserved for new defaults reported in the fourth quarter using our pre-COVID-19 reserve methodology which incorporates an average 9% claim rate estimate for early stage defaults. As a reminder, for new defaults reported in the second and third quarters of 2020, we provided a reserve using a 7% claim rate assumption. This assumption was based on expectation that programs such as the federal stimulus, foreclosure moratoriums, and mortgage forbearance may extent traditional default to claim timelines and result in claim rates lower than our historical experience.

We have not adjusted these reserves previously recorded in the second and third quarters as they continue to represent our best estimate of the ultimate losses associated with these defaults. Other underwriting operating expenses in the fourth quarter remained consistent with the third quarter at \$37 million. The expense ratio was 16.6% in the fourth quarter compared to 16.7% in the third quarter of 2020 and 19.9% in the fourth quarter a year ago. We estimate that other underwriting and operating expenses will be in the range of \$170 million to \$175 million for the full year 2021. The effective tax rate for 2020 was 15.7% and our guidance for 2021 is that our effective tax rate will be approximately 16%. The consolidated balance of cash and investments at December 31, 2020 was \$4.8 billion. Essent Group Ltd. paid a quarterly cash dividend totaling \$17.9 million to shareholders in December and maintains \$563 million of cash and investments at the holding company at year-end.

...

Phil Stefano – Deutsche Bank – Analyst

Got it, OK. And I guess, just to push back on that a bit, I mean, as we think about the foreclosure moratoriums continuing, forbearance being extended, what would be the rationale and how would you help me understand the -- assuming that the 9% comes back into play and maybe wouldn't be better than that at least in the short run?

Mark A. Casale – Chairman, President & Chief Executive Officer

Well, again, I think at some point, you have to get back to your normal reserving methodology. And I think that with the kind of the tsunami of defaults that we had in the second and third quarter, very similar to the hurricanes, right, in terms of like an isolated event, we thought it was prudent to kind of quarantine them so to speak, and really look at it that way.

I think in the fourth quarter, I think the message -- again, it's back to kind of business as usual, right. We're back to our normal reserve methodology, where the 9% has been money good for years and that'll just play out, Phil. So, with the forbearance, extension and home price appreciation actually helps lower that, that will come through the model, but you don't really want to run the company longer term, kind of on how we -- how we did those isolated reserve adjustments. The model has -- it's actuarially correct and factual for 10 years. And to me, this is a strong message that we're going back to the model. So again, I wouldn't get too caught up in whether it's too high or too low. It's adequate and the fact that we're back on the model, I think, is a really good thing.

Lawrence E. McAlee – Senior Vice President, Chief Financial Officer

And Phil, it's Larry. Just also, we view the second and third quarters as the exceptions. As Mark mentioned that was the tsunami, those were the exceptions. We felt it was the appropriate methodology for those two quarters. But now, as Mark said, we're back to business as usual.

²⁴ See <https://www.fool.com/earnings/call-transcripts/2021/02/19/essent-group-ltd-esnt-q4-2020-earnings-call-transcript/>.



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