Milliman's Mortgage Default Index as of 2019 Q2

Default risk of government-backed mortgages decreases as low-risk refinance borrowers take advantage of low interest rates

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The Milliman Mortgage Default Index (MMDI) is a lifetime default rate estimate calculated at the loan level for a portfolio of single-family mortgages. For the purposes of this index, default is defined as a loan that becomes 180 days delinquent or worse. For example, if the MMDI is 10%, then we expect the average mortgage originated in that month to have a 10% probability of becoming 180 days delinquent or worse over its lifetime. The results of the MMDI reflect the most recent data acquisition available from Freddie Mac, Fannie Mae, and Ginnie Mae, with measurement dates starting from January 1, 2014.

Key findings: 2019 Q2

The MMDI segments loans by agency (Freddie, Fannie, and Ginnie). Figure 1 provides the quarter-end index results for government-sponsored enterprises (GSE) loans (segmented by purchase and refinance) for the second quarter of 2019. Figure 2 provides the index results for Ginnie Mae loans (segmented by purchase and refinance) for the same time period.

The MMDI for GSE acquisitions (loans acquired by Freddie Mac and Fannie Mae) decreased from 2.01% in 2019 Q1 to 1.99% for 2019 Q2 originations. The decrease is largely driven by low-risk refinance borrowers taking advantage of the drop in interest rates during the time period in review. Refinance loans tend to have lower loan-to-value (LTV) ratios relative to purchase loans.

The MMDI for Ginnie Mae loans increased from 8.09% in Q1 to 8.15% in Q2. The increase in the MMDI for Ginnie Mae loans is consistent with and a continuation of the trend for prior origination quarters.

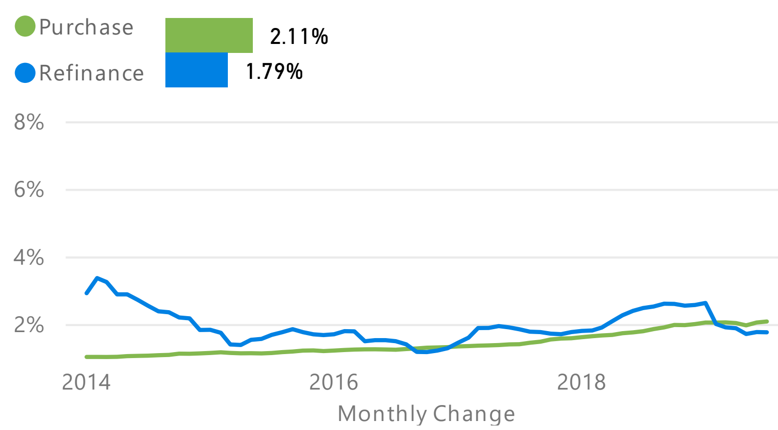
When reviewing quarter-over-quarter changes in the MMDI, it is important to note that the 2019 Q1 MMDI values for GSE and Ginnie Mae acquisitions have been restated since our last publication, changing from 2.06% to 2.01% and 8.51% to 8.09%, respectively. This is a result of updating actual home price movements from forecasts and including updated forecasts for future home price appreciation. Actual home price appreciation has exceeded projections, which can reduce the MMDI from period to period.

Figure 1 shows a summary of the latest MMDI. Figure 1 is segmented by loan purpose and filtered to GSE loans.

FIGURE 1: MMDI DASHBOARD FOR GSE LOANS

GSE DEFAULT RATE 1.99% | QUARTERLY CHANGE -0.02%

TOTAL MONTHLY VOLUME: $85.49bn Y-O-Y CHANGE: 17.70%



DEBT-TO-INCOME RATIO*	LOAN-TO-VALUE RATIO*	FICO SCORE*
36.0	78.6	750

*AVERAGE

For reference regarding how rates look during an extreme scenario, below is a summary of the default rates during the global financial crisis:

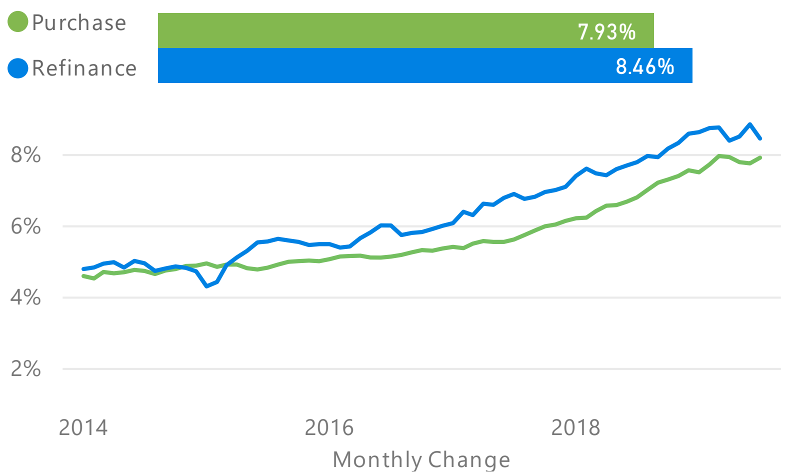
Origination Quarter	Purchase	Refinance
10/1/2007	16.76%	11.52%
1/1/2008	14.25%	8.64%
4/1/2008	13.01%	9.17%

Figure 2 shows a summary of the latest MMDI. Figure 2 is segmented by loan purpose and filtered to Ginnie loans.

FIGURE 2: MMDI DASHBOARD FOR GINNIE LOANS

GINNIE DEFAULT RATE 8.15% QUATERLY CHANGE 0.06%

TOTAL MONTHLY VOLUME: $36.57bn Y-O-Y CHANGE: 12.71%



DEBT-TO-INCOME RATIO*	LOAN-TO-VALUE RATIO*	FICO SCORE*
42.1	94.7	692

*AVERAGE

Agency differences

Freddie and Fannie acquisitions experienced a decreased risk profile over the prior three months. Most of the decrease is attributable to higher borrower credit quality as a function of an increased refinance market (which tends to have lower LTVs).

The credit risk of loans guaranteed by Ginnie Mae have experienced an increase in their default risk, which is consistent with the overall increasing trend that has occured since 2014.

Note that the results above do include upward pressure as a result of economic risk for all investors (Freddie, Fannie, and Ginnie). Our models estimate a slowdown in home price growth relative to prior years, which puts upward pressure on mortgage default risk. If actual home price growth exceeds these projections, the MMDI will adjust accordingly in future publications.

Components of default risk

The components of the MMDI that inform default risk are borrower risk, underwriting risk, and economic risk. Borrower risk measures the risk of the loan defaulting due to borrower credit quality, initial equity position, and debt-to-income ratio. Underwriting risk measures the risk of the loan defaulting due to mortgage product features such as amortization type, occupancy status, and others. Economic risk measures the risk of the loan defaulting due to historical and forecasted economic conditions.

Borrower risk results: 2019 Q2

Borrower risk has decreased across all investors and loan types over the last few months. With the decline in interest rates, rate/term refinance originations increased significantly. As borrowers refinance, they tend to do so at lower LTV ratios (with a cash-out refinance now being capped at 80% across all agencies), which reduces the credit risk of the underlying mortgages.

Underwriting risk results: 2019 Q2

Underwriting risk represents additional risk adjustments for property and loan characteristics such as occupancy status, amortization type, documentation types, loan term, and others. Underwriting risk after the global financial crisis remains low and is negative for purchase mortgages, which was generally full documentation, fully amortizing loans. Over the past three months, we have seen an increase in the percent of refinance loans that are rate/term, which have a lower risk profile relative to cash-out refinance mortgages.

Economic risk results: 2019 Q2

Economic risk is measured by looking at historic and forecasted home prices. Actual home price appreciation has been robust from 2014 through 2019 Q1, which has resulted in embedded appreciation for older originations. This results in reduced credit risk for older cohorts. For more recent cohorts, we anticipate slower home price growth (or negative growth for some local geographies), which contributes to increases in economic risk for recent origination years.

For more detail on the MMDI components of risk, visit www.milliman.com/MMDI.

About the Milliman Mortgage Default Index

Milliman is proficient in analyzing complex data and building econometric models that are transparent, intuitive, and informative. We have used our expertise to assist multiple clients in developing econometric models for evaluating mortgage risk both at point of sale and for seasoned mortgages.

The Milliman Mortgage Default Index (MMDI) uses econometric modeling to develop a dynamic model that is used by clients in multiple ways including analyzing, monitoring, and ranking the credit quality of new production, allocating servicing sources, and developing underwriting guidelines and pricing. Because the MMDI produces a lifetime default rate estimate at the loan-level, it is used by clients as a benchmarking tool in origination and servicing. The MMDI is constructed by combining three important components of mortgage risk: borrower credit quality, underwriting characteristics of the mortgage, and the economic environment presented to the mortgage. The MMDI uses a robust dataset of over 30 million mortgage loans, which is updated frequently to ensure it maintains the highest level of accuracy.

Milliman is one of the largest independent consulting firms in the world and has pioneered strategies, tools, and solutions worldwide. We are recognized leaders in the markets we serve. Milliman insight reaches across global boundaries, offering specialized consulting services in mortgage banking, employee benefits, healthcare, life insurance and financial services, and property and casualty insurance. Within these, Milliman consultants serve a wide range of current and emerging markets. Clients know they can depend on us as industry experts, trusted advisers, and creative problem-solvers.

Milliman's Mortgage Practice in Milwaukee is dedicated to providing strategic, quantitative, and other consulting services to leading organizations in the mortgage banking industry. Past and current clients include many of the nation's largest banks, private mortgage guaranty insurers, financial guaranty insurers, institutional investors, and governmental organizations.

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Milliman is among the world’s largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

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For more information and access to the loan-level detail, including seller, geographic, and channel break-outs, please reach out to Milliman.

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