## UNITED GUARANTY CORPORATION

## BASEL III RISK-WEIGHTED ASSETS COMMENT LETTER: MORTGAGE INSURANCE ANALYSIS AS OF MARCH 2012

Prepared by:
Milliman, Inc.
Kenneth A. Bjurstrom
Principal and Financial Consultant
Michael C. Schmitz, FCAS, MAAA
Principal and Consulting Actuary
Jonathan B. Glowacki, FSA, CERA, MAAA
Consulting Actuary

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## INTRODUCTION AND SUMMARY OF RESULTS

The Office of the Comptroller of the Currency, Treasury, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation ("Agencies") published a notice for public rulemaking, Regulatory Capital Rules: Standardized Approach for Risk-weighted Assets; Market Discipline and Disclosure Requirements ("Standardized NPR"), that seeks comment on proposed changes to the Agencies' general risk-based capital requirements for determining risk-weighted assets for banking institutions. This report will concentrate on the proposal for excluding the consideration of private mortgage insurance in calculating the loan-to-value ratio at origination ("LTV") in determining risk-weights for residential mortgage assets.

Risk-weights are used by bank regulators and others in the industry to evaluate the capital adequacy ratio for a bank as proposed by Basel II. The capital adequacy ratio is calculated as the ratio of a bank's core capital divided by risk-weighted assets. A lower risk-weight indicates a lower level of risk and results in lower levels of required capital.

The current methodology under the Basel II framework for residential mortgages assigns a risk-weight between 20 and 150 percent of a mortgage dependent upon the following factors: the presence of government guarantees; the LTV ratio of the mortgage; the lien of the mortgage; and the current status of the mortgage (i.e. current or past due). Under the current methodology, a bank could consider loan-level private mortgage insurance in determining the LTV of the mortgage. For example, if a loan had an LTV ratio of $90 \%$ with private mortgage insurance coverage, the LTV ratio of the mortgage for determining risk-weights could be reduced to less than $90 \%$ because of the coverage provided by the mortgage insurer. Mortgage insurers provide first-loss coverage up to a pre-determined limit that reduces the realized loss to the investor of the mortgage if the mortgage defaults.

The Standardized NPR proposes risk-weights between 50 and 200 percent of a mortgage dependent upon expanded criteria from the current framework that includes additional underwriting adjustments and requirements at origination of the loan. The Standardized NPR specifically excludes the recognition of primary mortgage insurance when calculating the LTV ratio of a residential mortgage exposure. According to the Standardized NPR, "The agencies believe that, due to the varying degree of financial strength of mortgage providers, it would not be prudent to recognize [private mortgage insurance] for purposes of the general risk-based capital rules ${ }^{1}$."

This report analyzes the credit risk assumed by mortgage insurers under a hypothetical prospective mortgage market as defined by "qualified mortgages" created by the Truth in Lending Act pursuant to section 1412 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. Using recent premium rates and other assumptions, Milliman simulates the required risk-to-capital ratio for a mortgage insurer insuring only "qualified mortgages" to estimate the amount of capital contributions required to support the assumed risk. Milliman's analysis indicates that the credit risk assumed by mortgage insurers will be significantly reduced in a "qualified mortgage" market compared to the historical risk assumed by mortgage insurers. Furthermore, under the assumptions in the model, mortgage insurers would require capital contributions in approximately $1 \%$ of the simulated trials under a 75 basis point premium rate scenario and $3 \%$ of the simulated trials under a 70 basis point premium rate.

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## BACKGROUND AND SCOPE OF ANALYSIS

Private mortgage insurance ("PMI") protects mortgage lenders and investors from potential credit losses stemming from borrower defaults. This credit protection reduces realized credit losses on defaulted mortgages to banks that portfolio the loans and facilitates the sale and transfer of mortgages in the secondary market. The second underwrite provided by the mortgage insurers enhances the quality of the mortgages insured by private mortgage insurers and results in a lower default frequency on insured loans compared to similar loans not insured by private mortgage insurers ${ }^{2}$.

Mortgage guaranty insurers manage mortgage default risk by diverting accumulated premium revenues and capital built up during relatively strong mortgage markets to cover claim losses in relatively weak mortgage markets. Default risk diversification is obtained geographically, temporally, and across levels of borrower credit risk. At the geographic level, insurers achieve diversification by writing business nationally, thereby enabling them to withstand severe regional economic downturns. On the temporal level, insurers are subject to stringent minimum surplus and reserve requirements - including contingency reserve requirements - imposed by state insurance regulators. Mortgage insurers are generally required to hold a risk-to-capital ratio of at least 25 to 1 (for every $\$ 25$ dollars of risk in force, the mortgage insurer must hold at least $\$ 1$ of capital) to cover unexpected losses. Contingency reserve requirements generally cause insurers to retain premiums earned during periods of economic expansion in order to cover claim losses incurred during periods of protracted economic recession. Geographic and temporal diversification provide a natural hedge against systematic risk inherent in mortgage guaranty insurance; that is, a mortgage guaranty insurance company with prudent pricing and capitalization can reasonably anticipate that sufficient diversification both geographically and temporally will be adequate in protecting the company against mild to severe economic downturns.

During the expansion years of the real estate and mortgage market from 2000 through 2007, the mortgage industry developed and originated alternative mortgage products such as no documentation loans, negative amortization loans, "teaser rate" loans, and others that fueled an expansion in mortgage credit. These products facilitated growth in the housing market and house prices. In 2006 and 2007, mortgages started to default and housing prices began a steep decline that contributed to large losses in the mortgage industry. As a result of these losses, some mortgage insurers became insolvent, breached the 25 to 1 capital requirement, or experienced a significant drain on capital. The mortgage insurance industry responded to these losses by increasing their underwriting and risk management processes. Examples of these enhancements include increased documentation requirements, implementation of higher FICO score and lower LTV limits, refined risk-based premiums, and other actions to mitigate their risk.

The United States government and its regulators have also responded to the recent mortgage crisis by issuing a series of proposals to govern the mortgage market and help prevent a similar crisis from recurring in the housing market. Proposed governing rules for mortgage lending, such as "qualified mortgages" created by the Truth in Lending Act pursuant to section 1412 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, will influence or prohibit the types and features of mortgages that will be originated. Mortgages that meet these proposed requirements have historically been associated with lower levels of default risk compared to mortgages that do not meet the proposed requirements.

The proposed requirements that will govern future mortgage lending along with risk management actions taken by the mortgage insurance industry may decrease the amount of credit risk assumed by the mortgage insurance industry. Using historical data of mortgage performance, this report will analyze the primary drivers of risk for a mortgage insurer after the implementation of these proposed requirements for mortgage lending.

[^1]At the time this report was written, the definition of a "qualified mortgage" as defined by the Truth in Lending Act or other mortgage reform proposals have not been finalized; however, the Agencies have issued NPR's summarizing the current considerations for a "qualified mortgage" and other reforms. Milliman reviewed these NPR's and current underwriting guidelines within the mortgage insurance industry to develop a definition of "Qualified Mortgages" for this report.

Milliman has been retained by United Guaranty Corporation ("UGC") to independently compare the credit risk profile of Qualified Mortgages to the credit risk profile of an unfiltered dataset of mortgages ("All Loans"). In addition to this comparison, Milliman was retained to simulate a probability distribution of the amount of capital required above cumulative earned premium to cover future obligations for a mortgage insurer that insures only Qualified Mortgages. Milliman defined contributed capital as the amount of capital contributed in excess of premium to meet future obligations with consideration for the timing of cash flows.

Milliman ran the simulation model under a single-book assumption and a multiple-book assumption. A single-book model projects the performance of a portfolio of mortgages originated in a single calendar (i.e. a single book of business) year over a period of 15 projection years. The single book simulation was designed to estimate the amount of capital needed to cover losses without consideration of other sources and uses of funds such as investment income, expenses or taxes.

The single-book analysis does not take into consideration the operating aspects of a mortgage insurance company such as the starting capital position of the company, investment income, expenses, taxes, or diversification. A mortgage insurance company obtains a diversification benefit through writing business across many book years. Therefore, Milliman also created a multiple-book simulation model that takes these aspects into consideration. The multiple-book model projects the performance of 15 consecutive books of business over a period of 15 projection years. The multiple-book model tracks the simulated sources and uses of funds for a mortgage insurance company that insures only Qualified Mortgages.

The results contained in this report are developed from publicly available data sources and do not specifically represent the risk or performance of loans insured by UGC.

## EXECUTIVE SUMMARY

Milliman relied on data from CoreLogic's LoanPerformance Servicing Database to develop this analysis. The data includes loan-level performance data and underwriting characteristics for loans originated between 1998 and 2012 with performance through March 31, 2012. Milliman used this data to project ultimate default rate distributions and cash flow timing assumptions for All Loans and Qualified Mortgages. Milliman appended mortgage insurer premium rates and average coverage levels to each loan based on the underwriting characteristics of the loans. The aggregate data was filtered for loans with the following characteristics:

## All Loans

- Loans with a complete performance history;
- Loans with an original combined loan-to-value ratio at origination greater than 80\%;
- Loans not insured by the Federal Housing Administration;
- Loans with a valid value for FICO score and combined loan-to-value ratio at origination;
- First lien loans;
- Non-construction loans; and
- Loans with a valid origination date.

Milliman defined Qualified Mortgages as a subset of All Loans that have the following characteristics:

## Qualified Mortgage

- Loans with a combined loan-to-value ratio at origination less than or equal to $97 \%$;
- Loans with a FICO score greater than or equal to 620;
- Full documentation loans;
- Fully amortizing loans (i.e. no interest only loans or negative amortization loans);
- Original term of 360 months or less;
- Periodic rate reset cap of $2 \%$ or less; and
- Lifetime rate reset cap of $6 \%$ or less.

Milliman estimated the ultimate default rate for All Loans and Qualified Mortgages by origination quarter for origination quarters from 1998 Q1 through 2011 Q4. Milliman fit a gamma distribution to the ultimate default rates for each set of loan cohorts to estimate a probability distribution of the potential ultimate default rate outcomes. The table below provides a summary of the empirical data and gamma fits by cohort:

| ULTIMATE DEFAULT RATE DISTRIBUTION BY COHORT |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |

The mean ultimate default rate for Qualified Mortgages is less than half of the mean ultimate default rate for All Loans in the database. The mean ultimate default rate for All Loans is $16.7 \%$ compared to $7.3 \%$ for Qualified Mortgages. The ultimate default rate under severe economic conditions as measured by the $99^{\text {th }}$ percentile ultimate default rate for Qualified Mortgages is significantly less than the comparable ultimate default rate for All Loans. Using the gamma fit to estimate the tail risk, the $99^{\text {th }}$ percentile ultimate default rate for All Loans and Qualified Mortgages is $61.2 \%$ and $24.6 \%$, respectively. This means the 1 out of 100 tail event based on the gamma distribution fit to historical data would have resulted in over 60 out of 100 loans defaulting; however, under the new proposed Qualified Mortgage requirements, the 1 out of 100 tail event would have resulted in 25 out of 100 mortgages defaulting.

## Single-Book Simulation

Using a cash flow simulation model developed specifically for mortgage insurance companies, Milliman estimated the capital contributions required to support the simulated losses associated with a single-book of $\$ 10$ billion of original loan volume ( $\$ 2.5$ billion of original risk under $25 \%$ mortgage insurance coverage) of only Qualified Mortgages. The single book simulation was designed to estimate the amount of capital needed to cover losses alone, without consideration of other sources and uses of funds such as investment income, expenses or taxes. Milliman ran the single-book model assuming average premium rates of 75 basis points and 70 basis points. Milliman estimated historical premium rates for each loan analyzed in this study using industry rate cards; the average premium rate for Qualified Mortgages originated in 2011 ranged between 70 and 75 basis points.

Milliman analyzed the risk-to-capital ratio from the simulations. The risk-to-capital ratio is equal to the original risk of a given book divided by the simulated contributed capital. Original risk is equal to the amount of new insurance written times the coverage percent of the insured cohort. This ratio conveys approximately how much capital is required to meet future obligations at a given level of confidence. For example, if the risk to capital ratio is 25 to 1 at the $95 \%$ confidence level, then in order to have met cash requirements in $95 \%$ of the simulated trials, the insurer needs to add capital equal to $4 \%(1 / 25)$ of the original risk.

The results of the simulations are summarized in the following table:

|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| RISK TO CAPITAL RATIO COMPARISON <br> NO REQUIRED CAPITAL OVER CONTINGENCY RESERVE, NO EXPENSES, NO INVESTMENT INCOME, NO TAXES <br> SINGLE-BOOK ANALYSIS ON \$10 BILLION OF ORIGINAL NIW OF QUALIFIED MORTGAGES (\$ THOUSANDS) |  |  |  |  |
|  |  |  |  |  |
| Confidence Level | Average Coverage Percent: 25\% Original Risk: \$2.5 Billion Initial Amount of Capital: \$0 |  |  |  |
|  | $\begin{gathered} \hline \text { Premium Rate } \\ 0.75 \% \\ \hline \end{gathered}$ |  | Premium Rate$0.70 \%$ |  |
|  | Contributed Capital | Risk to Capital Ratio | Contributed Capital | Risk to Capital Ratio |
| 80\% | 0 | NA | 0 | NA |
| 90\% | 0 | NA | 5,067 | 493.4 |
| 95\% | 47,263 | 52.9 | 71,236 | 35.1 |
| 97.5\% | 114,669 | 21.8 | 138,738 | 18.0 |
| 99.0\% | 200,877 | 12.4 | 223,519 | 11.2 |
| 99.5\% | 267,074 | 9.4 | 292,444 | 8.5 |
| 99.9\% | 435,668 | 5.7 | 464,215 | 5.4 |
| Percent of Trials with Zero Capital Contribution |  | 92.0\% |  | 89.0\% |

The last row of the table shows the percent of trials that resulted in a zero capital contribution; in other words, the percent of trials where the cumulative earned premium was adequate to cover cumulative paid losses at any given time. In the single-book analysis, nearly $90 \%$ of the trials resulted in zero contributed capital under both sets of premium rates. Therefore, under current premium rates for Qualified Mortgages, 9 out of 10 books of business would not require capital contributions from the mortgage insurer. If capital contributions are required, the simulation analysis indicates a risk-to-capital ratio of 35 to 1 would cover unexpected losses at a $95 \%$ confidence level using the lower premium rate of 70 basis points.

## Multiple-Book Simulation

Milliman estimated the capital contributions required to support the potential losses associated with 15 books of Qualified Mortgages for a newly capitalized mortgage insurer after a 15 year period. Each book was assumed to have $\$ 10$ billion of original loan volume ( $\$ 2.5$ billion of original risk under $25 \%$ mortgage insurance coverage). This assumption is based on a recent review of industry market share and volume trends. The multiple-book model is designed to simulate the number of times a mortgage insurer would require capital contributions if only Qualified Mortgages were insured and how much capital would be contributed in each case. The multi-book simulation includes various assumptions outlined in the body of this report that were selected to represent the starting financial position and ongoing expenses for a newly capitalized mortgage insurer. Milliman assumed an initial capital level of $\$ 500$ million based on capital requirements for newly organized mortgage insurance companies. Capital is not contributed in the model until the $\$ 500$ million on initial capital is depleted.

Milliman assumed an 85\% correlation between successive book years for ultimate default rates and prepayment speeds. The results of the simulations are summarized in the following table:

| TABLE 3 <br> RISK TO CAPITAL RATIO COMPARISON <br> NO REQUIRED CAPITAL OVER CONTINGENCY RESERVE, 20\% EXPENSE RATIO, 3\% INVESTMENT INCOME, 35\% TAX RATE <br> MUTIPLE-BOOK ANALYSIS ON \$10 BILLION OF ORIGINAL NIW OF QUALIFIED MORTGAGES PER YEAR <br> (\$ THOUSANDS) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |
| Confidence Level | Average Coverage Percent: 25\% Original Risk: \$37.5 Billion <br> Initial Amount of Capital: $\$ 500$ Million |  |  |  |  |  |
|  | Premium Rate0.75\% |  |  | Premium Rate$0.70 \%$ |  |  |
|  | Contributed Capital* | Risk to Contributed Capital Ratio | Risk to Capital Ratio** | Contributed Capital* | Risk to Contributed Capital Ratio | Risk to Capital Ratio** |
| 80\% | 0 | NA | NA | 0 | NA | NA |
| 90\% | 0 | NA | NA | 0 | NA | NA |
| 95\% | 0 | NA | NA | 0 | NA | NA |
| 97.5\% | 0 | NA | NA | 211,877 | 177.0 | 52.7 |
| 99.0\% | 555,779 | 67.5 | 35.5 | 777,770 | 48.2 | 29.3 |
| 99.5\% | 1,029,656 | 36.4 | 24.5 | 1,272,977 | 29.5 | 21.2 |
| 99.9\% | 1,931,488 | 19.4 | 15.4 | 2,165,954 | 17.3 | 14.1 |
| Percent of Trials with Zero Capital Contributions |  | 98.0\% | 98.0\% |  | 97.0\% | 98.0\% |

* Contributed capital in excess of the $\$ 500$ million of initial capital
** Calculated as Original Risk divided by contributed capital plus $\$ 500$ million
In the multiple-book analysis, at least $97 \%$ of the trials resulted in zero contributed capital under both sets of premium rates. Fewer trials resulted in capital contributions under the multiple book analysis because the mortgage insurance company starts out with $\$ 500$ million in initial capital, and the mortgage insurer receives temporal diversification across 15 books of business. If capital contributions are required, the simulation analysis indicates a risk-to-capital ratio of 52.7 to 1 would be adequate to cover unexpected losses at a $97.5 \%$ confidence level and a risk-to-capital ratio of approximately 30 to 1 would be adequate to cover unexpected losses at a $99.0 \%$ confidence level using the lower premium rate of 70 basis points. The risk-to-capital ratio mentioned in the text includes the $\$ 500$ million in initial capital. The 95\% confidence level did not require capital contributions.


## APPROACH TO ANALYSIS

## Source of Data

Milliman subscribes to the CoreLogic LoanPerformance Loan Level Servicing Data (CoreLogic Data). The CoreLogic Data contains loan-level underwriting and performance history for prime mortgage loans beginning with performance data in 1998. Note the servicing database is a distinct database from the CoreLogic LoanPerformance Loan Level Securities Database. The securities database includes loans typically classified as "sub-prime" and "alt-a" mortgages that were sold to the public via private-label mortgage-backed securities; the securities database was not used for this analysis. The servicing database includes a majority of prime loans and represents about $80 \%$ of the active prime mortgage market, according to CoreLogic.

The data from the servicing database contains underwriting characteristics and loan performance data such as loan status and loan balance from calendar years 1998 through 2012 (the last month of observation for this study is March 2012). Milliman processed the monthly payment records of the CoreLogic Data to obtain the following for each loan:

- the first month the loan appeared in the monthly data;
- the last month the loan appeared in the monthly data;
- the month it became a 90 day delinquency, if any;
- the month it became a Foreclosure, if any;
- the month it became a REO, if any;
- the month its status changed from active to closed; and
- any months its delinquency status changed from a 30, 60, 90, FCL or REO to a status of Current (i.e., all months it cured), if any.

This information was then merged with the origination characteristics (static attributes) dataset and the data were then scrubbed for the following data defects:

- Any loans for which the difference between the origination month and first month the loan appeared in the monthly file was greater than 3 months were removed. This gave us loans for which we know the history from start to finish, or the current state, as we did not wish to speculate on the occurrence of default events that may have occurred between origination and the month at which the Monthly Performance data was first recorded.

The resulting dataset contained fields flagging the event of a 90 day delinquency status and the month it first occurred and similar fields for foreclosure, REO, cure post default and subsequent re-default as well as when the loan terminated.

The purpose of this study is to compare the credit risk profile of Qualified Mortgages to All Loans and to estimate the amount of capital required for mortgage insurers that insure only Qualified Mortgages. Milliman defined the All Loans population and Qualified Mortgage population as follows:

## All Loans

- Loans with an original combined loan-to-value ratio at origination greater than $80 \%$;
- Loans not insured by the Federal Housing Administration;
- Loans with a valid value for FICO score and combined loan-to-value ratio at origination;
- First lien loans;
- Non-construction loans; and
- Loans with a valid origination date.

Milliman defined Qualified Mortgages as a subset of All Loans that have the following characteristics:

## Qualified Mortgage

- Loans with a combined loan-to-value ratio at origination less than or equal to $97 \%$;
- Loans with a FICO score greater than or equal to 620;
- Full documentation loans;
- Fully amortizing loans (i.e. no interest only loans or negative amortization loans);
- Original term of 360 months or less;
- Periodic rate reset cap of $2 \%$ or less; and
- Lifetime rate reset cap of $6 \%$ or less.

The table below provides the loan and default counts as of March 31, 2012 for each cohort used in this study. The CoreLogic Data does not provide a claim indicator within the dataset, so Milliman developed a definition of default. Default was defined as any terminated loan that reached a 90 -day delinquency status or worse and subsequently did not cure from the delinquency. If a loan did cure, Milliman determined whether the loan missed any payment after the cure; if the loan missed payments after the cure the loan was categorized as a default ${ }^{3}$.

| TABLE 4 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Cohort | LOAN COUNT SUMMARY BY COHORT <br> of Loans | Number <br> of Defaults | Default Rate as of <br> March 2012 |  |
| All Loans | $7,042,718$ | 566,480 | $8.04 \%$ |  |
| Qualified Mortgages | $2,699,258$ | 87,209 | $3.23 \%$ |  |

The data includes 7.0 million loans for the All Loans population and 2.7 million loans for the Qualified Mortgage population. Across all years, Qualified Mortgages represent $38 \%$ of the loan population by count. The default rate-to-date on the All Loans population across all years is $8.04 \%$, and the default rate-to-date on the Qualified Mortgage population across all years is $3.23 \%$. The default rate-to-date on Qualified Mortgages is $40 \%$ of the default rate-today for All Loans ( $0.40=3.23$ / 8.04).

Exhibit 1 provides summaries of the loan count and amount by origination quarter for All Loans and Qualified Mortgages. Exhibit 1 also provides the percent of loans that are Qualified Mortgages for each origination quarter. In origination quarters 2006 Q1 and 2006 Q2 the percent of loans that are Qualified Mortgages fell to a low of $17 \%$ by loan amount; after 2008 the percent of loans that were Qualified Mortgages averaged approximately $50 \%$ by loan amount.

Milliman appended home price appreciation data to the loan-level database using the Federal Housing Finance Agency (FHFA) home price indices at the core-based statistical area (CBSA) with actual home price indices as of December 31, 2011. Milliman relied on Moody's Economy.com home price index forecasts for home price index values after December 31, 2011.

## Ultimate Default Rate Projections

The CoreLogic Data contains performance information through March 31, 2012; therefore, Milliman projected ultimate default rates by origination quarter for the All Loans cohort and Qualified Mortgage cohort using actuarial methods. The section below provides a description of the methodologies used to estimate the ultimate default rates.

[^2]
## A Priori (Econometric) Default Rates

Milliman developed a priori default rates ${ }^{4}$ for each loan in the All Loans dataset as of March 31, 2012. These default rates were derived through an examination of the characteristics of each individual loan in the loan-level data. Milliman's a priori default rate model is a composite default rate calculation that combines three significant attributes of mortgage credit risk to estimate the frequency of borrower defaults. The three attributes are:

1. Credit worthiness of the borrower;
2. Underwriting characteristics of the loan; and
3. Macroeconomic influences.

Milliman developed baseline a priori default rates to estimate the default rate of a mortgage loan based upon the credit worthiness of the borrower. The credit worthiness of borrowers is estimated using a combination of two borrower attributes: FICO score and loan-to-value ratio (LTV). Below is a summary of Milliman's view regarding these two borrower characteristics.

- FICO Score: Borrowers with low FICO scores are deemed to present a larger credit risk; therefore, borrowers with low FICO scores are assigned a higher default rate; and
- LTV: Mortgages supported by lower collateral investment by the borrower could indicate a lower level of assets and/or relative earnings power compared to borrowers with high collateral investment; in addition, borrowers with a high LTV loans are subject to greater risk of a future negative equity position resulting from declines in home price appreciation or the costs associated with the disposition of a delinquent property. Therefore, higher LTV loans are assigned a higher default rate.

Milliman adjusts its baseline a priori default rates to account for the presence of various underwriting characteristics of the loan. Milliman selected risk factor adjustments to the baseline a priori default rates based on a review of historical performance of loans with particular risk factors relative to the performance of loans without the risk factor. The underwriting adjustments are applied using a logistic model.

The equation for the probability of a given response outcome in a logistic model is:
$P_{i}=e^{\sum \beta i X i} /\left(1+e^{\Sigma \beta i X i}\right)$, where the $X i$ are the independent covariates with $\beta i$ as their
associated coefficients.

For purposes of generating the adjustments to the a priori default rates, the underwriting loan characteristics considered were: amortization, interest-only option or negative amortization features, loan purpose, property type, occupancy type, documentation type, loan size, and loan term. Below is a summary of Milliman's view regarding these loan characteristics based on Milliman's review of historical mortgage loan performance:

[^3]- Amortization: Hybrid mortgages and ARMs are subject to interest rate risk and to potential payment fluctuations with the market. Borrowers with a fixed-rate mortgage are locked into an interest rate for the life of the loan and qualify for their mortgage at known debt-to-income ratios. Hybrid and ARM borrowers may face higher mortgage debt obligations at the rate reset period if the mortgage payment increases without a corresponding proportional increase in borrower income, thereby resulting in an increased probability of default. Accordingly, Milliman has assigned a larger risk factor for ARMs;
- Interest Only/Option ARM/Neg-Am: Borrowers with loans that have payment options such as only paying interest (as opposed to paying principal and interest) present a larger credit risk; thus, Milliman assigned a larger risk factor to these types of loans;
- Loan Purpose: Cash-out refinance loans can be indicative of financial stress on the borrower; loans of this type are assigned a larger risk factor than purchase or term-refinance loans. Industry data also indicates rate/term refinance loans are associated with higher default rates compared to purchase loans; therefore, Milliman assigns a higher risk factor to rate/term refinance loans compared to purchase loans;
- Property Type: Loans for 2-4 family homes and manufactured housing have exhibited a greater propensity for default based on industry data and are assigned larger risk factors;
- Occupancy Type: There is an increased likelihood of default with investor-owned loans because, under adverse economic conditions, an individual's loyalty to his/her investment property is significantly lower than their loyalty to their primary residence. The same relationship holds true for second homes, although not to such a severe degree. Therefore, Milliman has assigned larger risk factors to these types of loans;
- Documentation Type: Loans made with reduced documentation are more likely to default than those with full documentation provided at closing. Additionally, loans with no documentation (i.e., no income or asset verification) have a significantly greater chance of defaulting when compared to a full documentation loan. Milliman has assigned a larger risk factor to loans in these categories compared to full documentation loans;
- Loan Size: Larger loans have exhibited a greater propensity for default based on industry data. This propensity is thought to be due to the more volatile nature of home prices as they get larger and further away from the mainstream market. Therefore, loans above the conforming loan limit are assigned a larger risk factor; and
- Loan term: Loans with a term less than 30 years are associated with lower historical default rates compared to loans with a term of 30 years; therefore, Milliman assigned a smaller risk factor to these loans. Loans with a term greater than 30 years could be an indication of an affordability product for borrowers; these loans are associated with higher historical default rates compared to loans with a term of 30 years. Milliman assigns a greater risk factor to loans with a term greater than 30 years.

In addition to the underwriting qualities of a mortgage loan, certain economic variables can have a significant impact on mortgage credit risk. Consequently, Milliman has developed an economic- driven default adjustment model, which incorporates specific Home Price Index (HPI) scenarios. The model is calibrated to adjust default rates for a given loan based on location of the collateralizing property and historical and future HPI assumption inputs. For purposes of incorporating HPI, the location of the property is identified at the Core Based Statistical Area (herein referred to as "CBSA", but also commonly referenced as "metropolitan statistical area or "MSA") level. In the event that the loan level data does not indicate that the property is in a CBSA, the property state is used.

To calculate future HPI, Milliman used a settlement pattern that varies by age over twenty future quarters, as generated from industry data. A future weighted-average estimate of home price appreciation/depreciation is then calculated by applying a Milliman selected settlement pattern, based on an analysis of loss emergence in quarters and the corresponding future forecasted HPI for each defined scenario. Milliman then calculated the change in home price from loan origination to this weightedaverage home price. The motivation behind using a distribution of resolution dates (as opposed to using a single fixed quarter in the future) was to reflect a probability associated with reaching resolution at different points in time in the future.

After calculating each of the three components described above, Milliman calculated a combined a priori default rate for each loan in the All Loans dataset. These a priori default rates serve as an input for the Bornhuetter-Ferguson projection methods discussed below.

## Ultimate Default Rate Selection

After analyzing the loan-level characteristics and selecting a priori default rates, Milliman relied on judgment and a variety of standard actuarial methodologies to select ultimate default rates by book quarter. Three standard actuarial methodologies were considered in calculating ultimate default rate indications.

The first methodology to be illustrated is the loss development factor ("LDF") method. As a group of loans age, their collective cumulative defaults change. Their collective cumulative default rate similarly changes. This change in value over time is referred to as loss (or default) development. The LDF method is a traditional actuarial approach that relies on historical changes in losses (or defaults) from one evaluation point to another to project the current default rate to an ultimate default rate. Development patterns that have been exhibited by more mature (older) years, along with historical experience, are used to estimate the projected development of the less mature (more recent) years. This method is used with actual cumulative default rates through the first quarter of 2012. Milliman used the historical cohort performance data to develop the unique loss development patterns for All Loans and Qualified Mortgages separately; the loss development pattern for each cohort of loans is similar. As an example of the methodology, the selected loss development factors for the All Loans cohort are shown on Exhibit 2, Page 1. The ultimate default rate derivation for this cohort using the LDF method is shown on Exhibit 2, Pages 2-3. For origination quarter 2007 Q4, the ultimate default rate (49.03\%) is equal to the cumulative default rate-to-date (14.25\%) multiplied by the cumulative LDF factor (3.441).

In addition to the paid LDF method, Milliman also used the unadjusted and adjusted Bornhuetter-Ferguson ("B-F") method to project ultimate default rates. These methods are commonly used to provide a more stable estimate of ultimate default rates in situations where loss development is volatile, substantial and/or immature. The B-F method calculates an indicated future default rate. The indicated future default rate is calculated directly as the product of the selected a priori ultimate default rate (estimated based on loan characteristics of the loans and the economic risk adjustments discussed above) and a future default percent factor. The future default percent factor is derived from the LDF selection described in the LDF method. The estimated future default rate is added to the cumulative default rate to date to derive an estimated ultimate default rate. Exhibit 2, Pages 4-5 detail the unadjusted B-F ultimate default rate methodology for the All Loans cohort. Using the 2007 Q4 origination quarter as an example, the indicated unadjusted B-F ultimate default rate (34.82\%) is equal to the cumulative default rate-to-date (14.25\%) plus the indicated unadjusted future default rate (20.57\%), where the indicated unadjusted future default rate (20.57\%) is calculated as the product of the a priori ultimate default rate (29.00\%) and the future default percent, as determined by one minus the inverse of the cumulative LDF factor (1-1/3.441).

The adjusted B-F method is identical to the unadjusted B-F method with the exception of an adjustment to the a priori ultimate default rate. The a priori ultimate default rate used in the adjusted B-F method is derived from the selected a priori ultimate default rate, adjusted by an actual-to-expected persistency factor. This persistency adjustment is incorporated to allow for a projection of losses that reflects the variability associated with loan termination rates. The actual persistency is equal to the current loan amount for loans in force for a given origination quarter divided by the original loan amount for loans originated in an origination book quarter. The average historical persistency, also known as the a priori cumulative persistency, is estimated by Milliman using prepayment patterns developed from the Public Securities Association (PSA). The PSA level was selected by examining historical runoff triangles and selecting a long-term average persistency rate for each cohort. The PSA selection for the All Loans cohort is shown on Exhibit 2, Page 6. After applying the adjustment factor to the a priori ultimate default rate, the unadjusted and adjusted B-F methods are identical. The adjusted B-F methodology is demonstrated on Exhibit 2, Pages 7-8 for the All Loans cohort. For origination quarter 2007 Q4, the indicated adjusted B-F ultimate default rate (31.88\%) is equal to the cumulative default rate-to-date (14.25\%) plus the indicated adjusted future default rate (17.63\%), where the indicated adjusted future default rate is calculated as the product of the adjusted a priori ultimate default rate (24.85\%) and the future default percent, as determined by one minus the inverse of the cumulative LDF factor (1-1/3.441). The adjusted a priori ultimate default rate (24.85\%) is calculated as the unadjusted a priori ultimate default rate (29.00\%) times the actual percent in force (48.59\%) divided by the expected percent in-force (56.69\%).

After considering each of the ultimate default rate indications for each cohort, Milliman made ultimate default rate selections by origination quarter for All Loans; the selected ultimate default rates are summarized on Exhibit 2 Pages 9-10.

Exhibit 3 provides documentation for the development of the selected ultimate default rates for the Qualified Mortgage cohort.

## Default Probability Distribution Comparison

Milliman fit probability distributions to the estimated ultimate default rates. Milliman selected a gamma distribution for both All Loans and Qualified Mortgages. Exhibit 4 Page 1 provides summaries of the distribution for each cohort. The exhibit compares the empirical ultimate default rate distribution against the fitted ultimate default rate distribution for each cohort. The exhibit also shows the calculated percentile of the 2007 ultimate default rate for each cohort. For the time period reviewed, mortgages originated in 2007 typically represent the origination year with the highest level of ultimate default rates.

For All Loans the average ultimate default rate for loans originated in 2007 was $38.2 \%$; this represents the $92.8 \%$ percentile under the gamma fit. For Qualified Mortgages the average ultimate default rate for loans originated in 2007 was 18.1\%; this represents the $95.6 \%$ percentile under the gamma fit. The mean of the All Loans distribution and Qualified Mortgage distributions are $16.7 \%$ and $7.3 \%$, respectively. The mean ultimate default rate for Qualified Mortgages is less than half the mean ultimate default rate for All Loans. Exhibit 4 Pages 2 through 5 show the charts of the incremental and cumulative distribution fit for each cohort.

## Premium Rate Comparison

Milliman estimated a mortgage insurance premium rate for each loan in the data. The mortgage insurance premium rates were estimated using publicly available premium rate cards from the mortgage insurance industry from 2007 through 2011. Loans originated prior to 2007 were assigned a premium rate from the 2007 rate cards. Milliman determined the appropriate premium rate for each loan by matching the loan's origination year to the mortgage insurance industry premium rates in effect for that year. For example, if a loan was originated in 2008, the loan would be assigned a premium rate from rate cards published in 2008. If a loan was originated in 2011 , the loan would be assigned a premium rate from rate cards published in 2011. The mortgage insurance industry updated premium rates frequently
during this time period to reflect the current risks insured by the mortgage insurance industry. Exhibit 5 Page 1 provides a time series trend of the weighted average premium rate from 1998 through 2011. The exhibit segments the premium rate into the premium rate for Qualified Mortgages (red line), Non-Qualified Mortgages (blue line), and All Loans (black line). Historically, mortgage insurers charged a lower premium rate for Qualified Mortgages compared to Non-Qualified Mortgages. Recent origination quarters show the largest differentiation between premium rates for these two cohorts of loans. For all loans, premium rates have generally increased over the 2007 to 2011 time period.

Exhibit 5 Page 2 provides a chart of the average mortgage insurance coverage percent for Qualified Mortgages (red line), Non-Qualified Mortgages (blue line), and All Loans (black line). Qualified Mortgages originated in 2011 had an average coverage percent of approximately $25 \%$.

## Simulation Methodology

Milliman developed a Monte Carlo simulation model to estimate the capital required to support the potential losses associated with Qualified Mortgages. The cash flow model uses the assumptions discussed below to estimate the financial position of a mortgage insurance company across development years under different ultimate default rate and prepayment speed scenarios. The model takes into consideration specific characteristics of a mortgage insurance company such as contingency reserve requirements, payment timing patterns, and others. The model simulates 10,000 trials of the annual financial position of a mortgage insurance company for operating years 1 through 30 .

Milliman assumed an average coverage percent of $25 \%$, and Milliman ran the simulation model assuming annual premium rates of 70 and 75 basis points. As shown on Exhibit 5 Page 1, the average premium rate for Qualified Mortgages originated in 2011 ranged between 70 and 75 basis points. Milliman assumed a payout of simulated losses using the loss development factors derived in the Ultimate Default Rate Projections section of this report. Ultimate default rates were simulated in the model using the gamma distribution for Qualified Mortgages discussed in the Default Probability Distribution Comparison section of this report.

In the model, premiums are received until coverage is terminated, and premiums are assumed to be earned through the life of the policies. Written premiums by book year decrease for each successive calendar year until all loans are terminated or defaulted for a given book. The simulation model uses PSAs to quantify the tendency of a group of loans to remain in a book of business and persist to pay premium from year to year. Milliman gave consideration to current industry prepayment trends in the data when selecting PSA speeds. Milliman made a PSA selection of $375 \%$ PSA based on historical mortgage insurance prepayment speeds and the inherent correlation of prepayment speeds with the selected mean default rate. A 375\% PSA expresses a monthly series of annual conditional prepayments rates, beginning at $0.70 \%$ per year in the first month and increasing by $0.70 \%$ per year in each successive month until month 30 , when the series levels out at $20.89 \%$ per year until maturity. For the simulation, future prepayment speeds follow a log-normal distribution with means equal to the mean selected PSA for each cohort and a coefficient of variation equal to $40 \%$. Note these PSAs were used solely for projecting future premium levels. Prepayment speeds were assumed to be $70 \%$ negatively correlated with the simulated ultimate default rate. Therefore, high simulated default rates typically correspond to low prepayment speeds and vice versa.

Milliman defined contributed capital as the amount of capital contributed in excess of cumulative premium to meet future obligations with consideration for the timing of cash flows. Milliman did not 'reimburse' the mortgage insurer for contributed capital with future profits if future premium exceeded future paid obligations.

Milliman extracted the simulated ultimate default rate, the loss ratio, amount of contributed capital, and calculated the risk-to-capital ratio for each trial. The risk-to-capital ratio is equal to the original risk of a given book divided by the simulated contributed capital. Original risk is equal to the amount of new insurance written times the coverage percent of the insured cohort. This ratio conveys approximately
how much capital is required to meet future obligations at a given level of confidence. For example, if the risk to capital ratio is 25 to 1 at the $95 \%$ confidence level, then in order to have met cash requirements in $95 \%$ of the simulated trials, the insurer needs to add capital equal to $4 \%$ (1 / 25) of the original risk.

## Single-book Simulation

Milliman estimated the capital contributions required to support the potential losses associated with a single-book of Qualified Mortgages on $\$ 10$ billion of original loan volume ( $\$ 2.5$ billion of original risk under 25\% mortgage insurance coverage). Capital contributions were calculated in each development year and aggregated for development years 1 through 15 to determine the cumulative amount of contributed capital for each trial. Milliman assumed each book of business was completely run-off after a 15 year period. Milliman defined contributed capital as the amount of capital contributed in excess of cumulative premium to meet future obligations with consideration for the timing of cash flows. Future obligations included paid losses and contingency reserve accumulation. The single book analysis was designed to measure how frequently capital was required in addition to premium to support paid losses for an individual book of business without consideration of the operating aspects of a mortgage insurance company. Consequently, Milliman did not allow for dividends in the model and assumed investment income perfectly offset operating expenses and taxes.

## Multiple-Book Simulation

The single-book analysis does not take into consideration the operating aspects of a mortgage insurance company such as the starting capital position of the company, investment income, expenses, taxes, or diversification. A mortgage insurance company obtains a diversification benefit through writing business across many book years. These aspects are important because mortgage insurers accumulate capital from low ultimate default rate books that may be used to offset capital drain during high ultimate default rate books. Furthermore, investment income, expense, and tax assumptions capture cash flows that impact the capital base. Milliman created a multiple-book simulation model that takes these aspects into consideration.

Milliman estimated the capital contributions required to support the potential losses associated with 15 books of Qualified Mortgages for a newly capitalized mortgage insurer 15 years after the first book of business. Milliman assumed each book of business was completely run-off after a 15 year period. Each book was assumed to have $\$ 10$ billion of original loan volume ( $\$ 2.5$ billion of original risk under $25 \%$ mortgage insurance coverage). This assumption is based on a recent review of industry market share and volume trends. The multiple-book model is designed to simulate the number of times a mortgage insurer would require capital contributions if only Qualified Mortgages were insured and how much capital would be contributed in each case. The multi-book simulation did not allow for dividends and includes the following assumptions:

- $\quad \$ 500$ million in starting capital;
- $20 \%$ Expense Ratio (\% of written premium);
- 35\% Tax Rate; and
- 3\% Investment Yield on Assets.

Milliman assumed an 85\% correlation between successive book years for ultimate default rates and prepayment speeds.

These assumptions were selected to represent the starting financial position and expenses for a newly capitalized mortgage insurer and do not represent assumptions for UGC.

Milliman developed the investment yield assumption based on professional judgment and experience. A $3 \%$ investment yield may or may not be appropriate for any given mortgage insurer, and Milliman is not able to assess the reasonability of an interest rate of $3 \%$ for a mortgage insurer's investment portfolio
without performing a substantial amount of additional work beyond the scope of this report. As such, Milliman expresses no opinion on the appropriateness of the selected interest rate.

Capital contributions were calculated in each development year and aggregated for all development years to determine the cumulative amount of contributed capital for each trial. Milliman defined contributed capital as the amount of capital contributed in excess of cumulative premium and investment income to meet future obligations with consideration for the timing of cash flows. Capital is not contributed in the model until the $\$ 500$ million on initial capital is depleted. Future obligations included paid losses, contingency reserve accumulation, taxes, and expenses. Milliman did not allow for dividends in the model.

## Simulation Results

Exhibit 6 provides a summary of the simulation results. Exhibit 6 Page 1 provides the results for the single-book simulation, and Exhibit 6 Page 2 provides the results for the multiple-book simulation.

## Single-book Simulation Results

Exhibit 6 Page 1 lists the simulated risk-to-capital ratio at different percentiles. An $\alpha$-percentile is the value at which $\alpha \%$ of the trials resulted in risk-to-capital ratios equal to or greater than the $\alpha$-percentile simulated risk-to-capital ratio ${ }^{5}$. For example, the 95th percentile risk-to-capital ratio under the 70 basis point premium rate is 35.1 ; therefore, $95 \%$ of the trials (or 9,500 out of the 10,000 trials) resulted in risk-to-capital ratios at or above 35.1. In other words, for 9,500 trials a mortgage insurance company with an initial risk-to-capital ratio of 35.1 would not need capital contributions to cover paid losses.

In the exhibit, the set of columns on the far left shows the simulated ultimate default rates under 75 basis point and 70 basis point premium rates. The ultimate default rate is not influenced by the premium rate, so these two columns are identical. This column provides information on the number of defaults expected at each level of confidence. Milliman assumed a $100 \%$ loss severity in the model. The set of columns to the right of the ultimate default rate distributions shows the simulated loss ratio. The loss ratio, equal to paid losses divided by earned premium, provides for a test of premium adequacy. A ratio above 1 indicates ultimate losses were greater than earned premium, and a ratio less than 1 indicates ultimate losses were less than earned premium. The third set of columns shows the dollar amount of contributed capital at each level of confidence. The risk-to-capital ratio is shown in the far right set of columns. The risk-to-capital ratio is equal to the contributed capital divided by the original risk.

The box underneath the simulated percentile tables shows the percent of trials that resulted in a zero capital contribution; in other words, the percent of trials where the premium rate was adequate to cover paid losses. In the single-book analysis, nearly $90 \%$ of the trials resulted in zero contributed capital. Therefore, under current premium rates for Qualified Mortgages, 9 out of 10 books of business would not require capital contributions from the mortgage insurer.

## Multiple-book Simulation Results

Exhibit 6 Page 2 summarizes the results of the multiple-book simulation. The multiple-book exhibit adds additional columns for the risk-to-capital ratio. The first column for the risk-to-capital ratio, labeled "Risk to Contributed Capital Ratio", calculates the risk-to-capital ratio as ratio of original risk divided by the amount of required capital in excess of the $\$ 500$ million of initial capital for the mortgage insurer. The second column for the risk-to-capital ratio, labeled "Risk to Capital Ratio", calculates the risk-to-capital ratio as the ratio of original risk divided by sum of the contributed capital plus the $\$ 500$ million in initial capital.

[^4]In the multiple-book simulation, approximately $97 \%$ of the trials resulted in zero capital contributions in excess of the $\$ 500$ million of initial capital under both the 75 and 70 basis point premium rate assumptions. The reason for the greater number of trials that resulted in zero capital contributions is twofold: first, the mortgage insurer begins the simulation with $\$ 500$ million in initial capital and second, the temporal diversification benefit.

The ultimate default rate percentiles in this Exhibit show the average simulated default rate for each of the 15 books of business; the value of the ultimate default rate percentiles are lower than the ultimate default percentiles for the single-book simulation. For example, the $99^{\text {th }}$ percentile ultimate default rate for the multiple-book simulation is $19.1 \%$; this compares to a $99^{\text {th }}$ percentile ultimate default rate for the singlebook simulation of $24.7 \%$. The difference represents the temporal diversification benefit for mortgage insurers. Some books of business for a mortgage insurer will experience severe default rates; however, it is unlikely that all 15 books of business for a mortgage insurance company will result in severe default rates. Therefore, the average ultimate default rate is lower in the tail of the multiple-book simulation compared to the single-book simulation.

The 97.5 th percentile risk-to-capital ratio under the 70 basis point premium rate is 52.7 including the $\$ 500$ million in initial capital; therefore, $97.5 \%$ of the trials (or 9,750 out of the 10,000 trials) resulted in risk-tocapital ratios at or above 52.7. In other words, for 9,750 trials a mortgage insurance company with an initial risk-to-capital ratio of 52.7 would not need capital contributions to cover paid losses for multiplebooks of Qualified Mortgages. The 95\% confidence level did not require capital contributions.

## QUALIFICATIONS, LIMITATIONS AND DISCLOSURES

In performing this analysis, we have relied on data and other information available to us through CoreLogic's LoanPerformance databases and publicly available mortgage insurance rate cards. We have not audited or verified this data and information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

The simulated losses discussed in this report are developed using publicly available data of Qualified Mortgages as defined above originated between 1998 and 2011. The ultimate loss rate distributions were not developed to fit any particular mixture of mortgages, notwithstanding the data filters discussed in this report, and may not reflect additional underwriting criteria that may be imposed by a mortgage insurance company. Furthermore, the data used to develop the distributions may not reflect the mix of business written by any given mortgage insurance company. For example, the data used to develop the distributions may have higher or lower average FICO scores compared to the business written by a mortgage insurer. The results presented in this report could differ, perhaps materially, if the mix of business written by a mortgage insurer is different from the mix of business used in this analysis.

Any study of future operating results involves estimates of future contingencies. While our analysis represents our best professional judgment, arrived at after careful analysis of the available information, it is important to note that a significant degree of variation from our projections is not only possible, but is in fact, probable. We have attempted to reflect this variability by providing a range of projected outcomes under various scenarios. However, there is no assurance that the actual ultimate outcomes will fall within the range provided. The sources of this variation are numerous: future national or regional economic conditions, mortgage prepayment speeds, and legislative changes could affect the performance of a mortgage insurer.

A simulation model illustrates the projected impact of actual results varying from projected results due to estimated variability inherent in the insurance process. This variability is referred to as process risk. Our simulation does not reflect the variation of actual results from projections due to parameter risk or specification risk. Parameter risk refers to the risk or uncertainty associated with the selection of the parameters underlying the applicable projection model. Specification risk refers to the risk or uncertainty surrounding the selection of the type of model used for the forecast. We have not attempted to quantify the impact of parameter or specification risk. Additionally, Milliman's analysis is limited to the variability of losses and premiums. Other risks, including but not limited to: operational, asset, liquidity, legal, regulatory and strategic, are outside the scope of our analysis.

The uncertainty associated with our estimates is also magnified by the nature of mortgage insurance. Mortgage insurance results are sensitive to economic factors such as unemployment, housing market conditions, interest rate levels, etc. Past experience may not be indicative of future conditions. A loan underwritten in a given year is generally insured over several calendar years. Therefore, adverse economic conditions in a given calendar year could affect results not only for the current underwriting year, but also for prior underwriting years. Future economic developments that give rise to additional delinquencies and losses will impact ultimate losses. Loss forecasts are significantly more uncertain given the current economic deterioration, elevated default rates and adverse house price trends.

Continuing volatility in the housing and mortgage markets, as well as the overall economy, make it difficult to forecast a mortgage insurers future financial position. The unsettled economic environment may worsen, causing more future claims than currently forecasted. Potentially offsetting the economic factors are government-led initiatives which could have a stabilizing impact on the key variables that typically drive the level of future premiums and losses.

The analysis and any conclusions provided in Milliman's deliverables are based on data provided to Milliman by third party sources. Milliman does not warrant the accuracy or completeness of any third party data, and disclaims any and all liability in connection with such third party data. Any errors in the data provided may affect the results of our analysis. Milliman shall not be liable for the results of its analysis to the extent errors are contained in third party data sources.

## Disclosures

Actuarial Standards require us to disclose the following:

## Purpose

The purpose of this analysis is to independently estimate the amount of required capital needed to cover unexpected losses for Qualified Mortgages. Unexpected losses are losses incurred in excess of losses expected to be covered by earned premium. Performance data used in our analysis was evaluated as of March 31, 2012.

## Constraints

There have been no constraints on this project (such as time, availability of data, or access to staff) that materially impacted our ability to provide this analysis to UGC.

## Scope

Our estimates of each cohort's capital requirements with mortgage insurance business under a run-off scenario are characterized as statistically-defined estimates (mean, median, nth percentile) and Monte Carlo simulation distributions.

Our estimates are on andiscounted with respect to the time value of money.
Our estimates do not include Unallocated Loss Adjustment Expenses (ULAE). ULAE typically includes other claims administration expenses.

## LIMITED DISTRIBUTION OF RESULTS

Milliman's work is prepared solely for the internal business use of United Guaranty Corporation. Except as set forth below, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to legally benefit any third-party recipient of its work product, even if Milliman consents to the release of its work product to a third party. United Guaranty Corporation may distribute or submit for publication the final, Non-draft version of reports that, by mutual written agreement, are intended for general public distribution as well as any summaries, abstracts, or press releases prepared by United Guaranty Corporation subject to Milliman's prior review and approval, which shall not be unreasonably withheld or delayed. United Guaranty Corporation shall not edit, modify, summarize, abstract, or otherwise change the content of any final report and any distribution must include the entire report. Press releases mentioning such reports may be issued by Milliman or United Guaranty Corporation upon mutual agreement of United Guaranty Corporation and Milliman as to their content. Mentions of Milliman work will provide citations that will enable the reader to obtain the full report. Notwithstanding the foregoing, no Milliman report shall be used by United Guaranty Corporation in connection with any offering, prospectus, securities filing, or solicitation of investment. Professional reviewers engaged by United Guaranty Corporation or independent journals to provide peer review of Milliman's work must agree to terms of confidentiality that are reasonable and customary in the industry. Any piece of Milliman draft work to be provided to peer reviewers must receive prior Milliman approval, and Milliman shall not unreasonably withhold such approval. The copyright to all report content shall remain with Milliman unless otherwise agreed.

Any reader of this report must possess a certain level of expertise in areas relevant to this analysis to appreciate the significance of the assumptions and the impact of these assumptions on the illustrated results. The reader should be advised by, among other experts, actuaries or other professionals competent in the area of actuarial projections of the type in this report, so as to properly interpret the projection results.

If you should have any questions with regard to this analysis or would like to have us consider additional information, please do not hesitate to contact us. We appreciate the opportunity to work with United Guaranty Corporation on this assignment.

Respectfully submitted,


Kenneth A. Bjurstrom
Principal and Financial Consultant


Michael C. Schmitz, FCAS, MAAA
Principal and Consulting Actuary


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

## KAB/JBG/sbs

October 16, 2012

## APPENDIX: COMPARISON OF RELATIVE DEFAULT PERFORMANCE FOR PRIVATELY INSURED MORTGAGES TO NON-INSURED MORTGAGES

Mortgage guaranty insurance protects mortgage lenders and investors from potential credit losses stemming from borrower defaults. This credit protection reduces realized credit losses on defaulted mortgages for banks that hold mortgage loans in their portfolio and facilitates the sale and transfer of mortgages in the secondary market. Additionally, the second underwrite provided by the mortgage insurers enhances the quality of the mortgages insured by private mortgage insurers and results in a lower default frequency on insured loans compared to similar loans not insured by private mortgage insurers.

Milliman published a study on the benefit of the second underwrite titled Mortgage Insurance Loan Performance Analysis as of March 31, 2011 dated July 28, 2011. The study demonstrated that loans with mortgage insurance defaulted at a lower rate than loans not insured by private mortgage insurers, all else equal. The study was performed on loans originated between 2002 and 2007, and the results of the study were statistically significant. This appendix provides an update to this study using recent empirical default rates from the CoreLogic database for more recent origination years. The CoreLogic Servicing database has fields that identify loans with and without private mortgage insurance.

Milliman analyzed the same data described in this report to evaluate the benefit of the second underwrite provided by mortgage insurers. The data indicates that after 2008, the mortgage insurance industry was more selective in the loans it underwrote and insured, and loans with private mortgage insurance defaulted at a lower rate compared to similar Non-insured mortgage loans.

During the period in which the studied loans were originated, the private mortgage insurance companies delegated approval authority to the Freddie Mac and Fannie Mae ("GSE's") and their automated underwriting systems. It is difficult to separate the impact of the decisions made by Desktop Underwriter (Fannie Mae's automated underwriting system) and Loan Prospector (Freddie Mac's automated underwriting system) from the impact of the private mortgage insurance companies in those loans. Milliman segmented the loans into three cohorts: all loans in the dataset, GSE loans, and Non-GSE loans. The loans used in the appendix exclude loans insured by the Federal Housing Administration.

For this analysis Milliman defined a default as any loan that reached a 90-day delinquency status or worse. Milliman wanted to review the relative performance of privately insured loans compared to Noninsured loans for recent origination years. Using the definition of default described is this report would reduce the number of default incidence in the data for recent origination years because the default definition described in the report is conditional on the loan being terminated.

The table on the next page summarizes the relativity of the cumulative default rate for all loans insured by private mortgage insurers (PMI Loans) to similar loans not insured by private mortgage insurers (Non-PMI Loans) for all loans in the dataset, GSE loans, and Non-GSE loans.

| TABLE 5 <br> Default Rate Relativity (PMI to Non-PMI) <br> All Loan Purposes |  |  |  |
| :---: | :---: | :---: | :---: |
| Origination Year | All Loans | GSE Loans | Non-GSE Loans |
| 1998 | 0.98 | 1.29 | 0.30 |
| 1999 | 0.84 | 1.05 | 0.57 |
| 2000 | 0.57 | 0.65 | 0.56 |
| 2001 | 0.63 | 0.74 | 0.54 |
| 2002 | 0.70 | 0.89 | 0.81 |
| 2003 | 0.95 | 1.25 | 0.64 |
| 2004 | 0.81 | 1.11 | 0.88 |
| 2005 | 0.63 | 0.86 | 0.70 |
| 2006 | 0.60 | 0.69 | 0.64 |
| 2007 | 0.70 | 0.90 | 0.73 |
| $\mathbf{2 0 0 8}$ | $\mathbf{0 . 5 4}$ | $\mathbf{0 . 7 4}$ | $\mathbf{0 . 6 9}$ |
| $\mathbf{2 0 0 9}$ | $\mathbf{0 . 1 6}$ | $\mathbf{0 . 3 1}$ | $\mathbf{0 . 1 9}$ |
| $\mathbf{2 0 1 0}$ | $\mathbf{0 . 3 9}$ | $\mathbf{0 . 3 9}$ | $\mathbf{0 . 5 1}$ |
| $\mathbf{2 0 0 8 - 2 0 1 0}$ Average | $\mathbf{0 . 3 6}$ | $\mathbf{0 . 4 8}$ | $\mathbf{0 . 4 6}$ |
| Average of All Years | $\mathbf{0 . 6 5}$ | $\mathbf{0 . 8 3}$ | $\mathbf{0 . 6 0}$ |

The average default rate across all years and all loans is 0.65 for PMI loans compared to Non-PMI Loans. Default rate relativities less than 1 indicate the cumulative default rate on PMI loans is lower than the cumulative default rate on Non-PMI loans. For the 2008 through 2010 origination years the average default rate relativity is $0.36[0.36=(0.54+0.16+0.39) / 3]$ for all loans. In other words, loans originated between 2008 and 2010 that are insured by private mortgage insurers are defaulting at a rate of approximately $36 \%$ of the default rate for similar loans not insured by private mortgage insurers.

The default rate relativity is higher for GSE loans compared to all loans with an average default rate relativity of 0.83 . For the 2008 through 2010 origination years the average default rate relativity for GSE loans is $0.48[0.48=(0.74+0.31+0.39) / 3]$. The lower default rate relativity for recent origination years indicates that private mortgage insurers have been more effective in managing credit risk for GSE loans compared to loans not insured by private mortgage insurers.

The average default rate relativity across all years for Non-GSE loans is 0.60 . For the 2008 through 2010 origination years the average default rate relativity for Non-GSE loans is $0.46[0.46=(0.69+0.19+0.51)$ / 3]. For Non-GSE loans private mortgage insurers are providing a second underwrite that reduces the incidence of default.

Appendix Exhibit 1 Pages 1 through 3 provides the details for the figures in the above table. For example Appendix Exhibit 1 Page 1 provides a summary of the loan counts and calculations for the All Loans column. The exhibit shows for both Non-PMI loans and PMI loans the origination year of the loans, the number of loans in the cohort, the number of defaulting loans, the default rate, the average FICO score, and the average CLTV for each cohort. The column on the right of the exhibit calculates the default rate relativity as the ratio of the PMI Loans default rate to the Non-PMI Loans default rate. Appendix Exhibit 1 Pages 2 and 3 provide the summaries of the loan counts and calculations for GSE and Non-GSE loans.

Appendix Exhibit 2 provides charts of the cumulative default rate development for PMI Loans and NonPMI Loans for origination years 2008 through 2010. The cohorts on the charts are: All Loans, GSE Loans, and Non-GSE Loans. The charts demonstrate PMI Loans are consistently performing better than Non-PMI Loans in terms of default incidence for recent originations.

Milliman reviewed the loans counts in the data for GSE loans without PMI. For recent origination years, the majority of GSE loans without PMI are classified as rate or term refinance loans. Milliman thinks a large portion of these loans may be related to governmental programs such as the Home Affordable Refinance Program ("HARP") and others and may bias the performance difference in PMI loans to NonPMI loans. Therefore, Milliman re-created the analysis described above using only loans flagged as purchase loans in the data. The table below provides a summary of the results.

| TABLE 6 <br> Default Rate Relativity (PMI to Non-PMI) <br> Purchase Loans Only |  |  |  |
| :---: | :---: | :---: | :---: |
| Origination Year | Purchase Loans | GSE Purchase <br> Loans | Non-GSE Purchase <br> Loans |
| 1998 | 0.86 | 1.16 | 0.32 |
| 1999 | 0.76 | 0.98 | 0.56 |
| 2000 | 0.54 | 0.62 | 0.54 |
| 2001 | 0.52 | 0.62 | 0.50 |
| 2002 | 0.61 | 0.84 | 0.70 |
| 2003 | 0.92 | 1.35 | 0.60 |
| 2004 | 0.82 | 1.20 | 0.89 |
| 2005 | 0.66 | 0.93 | 0.75 |
| 2006 | 0.63 | 0.74 | 0.66 |
| 2007 | 0.76 | 0.86 | 0.77 |
| $\mathbf{2 0 0 8}$ | $\mathbf{0 . 5 5}$ | $\mathbf{0 . 1 0}$ | $\mathbf{0 . 8 3}$ |
| $\mathbf{2 0 0 9}$ | $\mathbf{0 . 1 2}$ | $\mathbf{0 . 4 7}$ | $\mathbf{0 . 7 4}$ |
| $\mathbf{2 0 1 0}$ |  | $\mathbf{0 . 2 8}$ | $\mathbf{0 . 2 9}$ |
|  | $\mathbf{0 . 2 6}$ |  | $\mathbf{0 . 4 4}$ |
| $\mathbf{2 0 0 8 - 2 0 1 0}$ Average | 0.60 | $\mathbf{0 . 5 2}$ | 0.59 |
| Average of All Years |  | 0.84 |  |

The average default rate across all years and all loans for purchase loans is 0.60 for PMI loans compared to Non-PMI Loans. For the 2008 through 2010 origination years the average default rate relativity is 0.26 $[0.26=(0.55+0.10+0.12) / 3]$ for all purchase loans. In other words, purchase loans originated between 2008 and 2010 that are insured by private mortgage insurers are defaulting at a rate of approximately $26 \%$ of the default rate for similar loans not insured by private mortgage insurers.

The default rate relativity is higher for GSE purchase loans compared to all purchase loans with an average default rate relativity of 0.84 . For the 2008 through 2010 origination years the average default rate relativity for GSE purchase loans is $0.52[0.52=(0.83+0.47+0.28) / 3]$. The lower default rate relativity for recent origination years again indicates that private mortgage insurers have been more effective in managing credit risk for GSE purchase loans compared to loans not insured by private mortgage insurers.

The average default rate relativity across all years for Non-GSE purchase loans is 0.59 . For the 2008 through 2010 origination years the average default rate relativity for Non-GSE purchase loans is 0.44 $[0.44=(0.74+0.29+0.29) / 3]$. For Non-GSE purchase loans private mortgage insurers are providing a second underwrite that reduces the incidence of default.

Appendix Exhibit 3 Pages 1 through 3 provides the details for the figures in the above table for Purchase Loans, GSE Purchase loans, and Non-GSE Purchase loans, respectively.

Appendix Exhibit 4 provides charts of the cumulative default rate development for purchase loans segmented into PMI Loans and Non-PMI Loans for origination years 2008 through 2010. The cohorts on the charts are: Purchase Loans, GSE Purchase Loans, and Non-GSE Purchase Loans. The charts demonstrate purchase loans with PMI are consistently performing better than purchase loans without PMI in terms of default incidence for recent originations.

United Guaranty Corporation
Summary of Qualified M ortgage Filter from the Corelogic Servicing Database
by Origination Period

|  | Loan Count |  |  | Loan Amount (\$000's) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Percent of Total |  |  | Percent of Total |  |  |
|  |  |  | Number of |  | Loan Amount for | Number of |
|  |  | Number of Loans | Loans that are |  | Loans that are | Loans that are |
| Origination | Total Number of | that are Qualified | Qualified |  | Qualified | Qualified |
| Period | Loans | M ortgages | M ortgages | Total Loan Amount | M ortgages | M ortgages |
| 19984 | 49,611 | 22,851 | 46.1\% | 5,725,397 | 2,732,034 | 47.7\% |
| 19991 | 42,547 | 20,242 | 47.6\% | 4,962,599 | 2,464,921 | 49.7\% |
| 19992 | 41,766 | 18,485 | 44.3\% | 4,816,568 | 2,232,712 | 46.4\% |
| 19993 | 29,921 | 13,187 | 44.1\% | 3,384,091 | 1,541,201 | 45.5\% |
| 19994 | 20,526 | 9,359 | 45.6\% | 2,258,999 | 1,049,562 | 46.5\% |
| 20001 | 13,209 | 5,536 | 41.9\% | 1,423,255 | 594,673 | 41.8\% |
| 20002 | 14,060 | 6,226 | 44.3\% | 1,488,966 | 659,442 | 44.3\% |
| 20003 | 16,500 | 8,276 | 50.2\% | 1,800,167 | 922,617 | 51.3\% |
| 20004 | 19,922 | 10,153 | 51.0\% | 2,244,833 | 1,173,765 | 52.3\% |
| 20011 | 45,921 | 23,416 | 51.0\% | 5,834,443 | 3,030,121 | 51.9\% |
| 20012 | 65,084 | 33,856 | 52.0\% | 8,438,898 | 4,511,614 | 53.5\% |
| 20013 | 57,734 | 28,662 | 49.6\% | 7,527,453 | 3,751,412 | 49.8\% |
| 20014 | 87,637 | 43,570 | 49.7\% | 11,826,282 | 5,872,753 | 49.7\% |
| 20021 | 76,998 | 37,835 | 49.1\% | 10,395,551 | 5,108,902 | 49.1\% |
| 20022 | 80,358 | 37,185 | 46.3\% | 10,888,558 | 5,065,121 | 46.5\% |
| 20023 | 124,631 | 60,519 | 48.6\% | 17,827,570 | 8,726,207 | 48.9\% |
| 20024 | 172,257 | 86,357 | 50.1\% | 25,563,653 | 12,831,226 | 50.2\% |
| 20031 | 168,196 | 85,736 | 51.0\% | 25,369,849 | 12,871,674 | 50.7\% |
| 20032 | 221,225 | 113,711 | 51.4\% | 34,533,311 | 17,496,587 | 50.7\% |
| 20033 | 216,445 | 105,323 | 48.7\% | 33,991,443 | 16,080,073 | 47.3\% |
| 20034 | 131,287 | 53,612 | 40.8\% | 20,345,652 | 7,969,892 | 39.2\% |
| 20041 | 139,650 | 56,202 | 40.2\% | 22,986,818 | 8,543,585 | 37.2\% |
| 20042 | 161,797 | 58,452 | 36.1\% | 27,135,007 | 8,951,480 | 33.0\% |
| 20043 | 142,506 | 44,246 | 31.0\% | 24,551,812 | 6,791,680 | 27.7\% |
| 20044 | 142,820 | 41,016 | 28.7\% | 26,505,813 | 6,593,991 | 24.9\% |

United Guaranty Corporation
Summary of Qualified M ortgage Filter from the Corelogic Servicing Database
by Origination Period

|  | Loan Count |  |  | Loan Amount (\$000's) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Percent of Total |  |  | Percent of Total |  |  |
|  |  |  | Number of |  | Loan Amount for | Number of |
|  |  | Number of Loans | Loans that are |  | Loans that are | Loans that are |
| Origination | Total Number of | that are Qualified | Qualified |  | Qualified | Qualified |
| Period | Loans | M ortgages | M ortgages | Total Loan Amount | M ortgages | M ortgages |
| 20051 | 135,002 | 38,345 | 28.4\% | 26,273,959 | 6,392,548 | 24.3\% |
| 20052 | 191,910 | 50,259 | 26.2\% | 40,668,737 | 8,696,218 | 21.4\% |
| 20053 | 219,159 | 59,743 | 27.3\% | 48,439,563 | 10,749,097 | 22.2\% |
| 20054 | 182,415 | 43,734 | 24.0\% | 41,438,093 | 7,866,798 | 19.0\% |
| 20061 | 166,643 | 36,482 | 21.9\% | 38,243,128 | 6,617,219 | 17.3\% |
| 20062 | 208,784 | 42,944 | 20.6\% | 47,781,799 | 8,000,315 | 16.7\% |
| 20063 | 213,740 | 45,855 | 21.5\% | 47,797,681 | 8,567,663 | 17.9\% |
| 20064 | 221,985 | 48,760 | 22.0\% | 50,998,310 | 9,457,489 | 18.5\% |
| 20071 | 235,067 | 52,506 | 22.3\% | 54,503,199 | 10,566,419 | 19.4\% |
| 20072 | 328,919 | 79,407 | 24.1\% | 73,546,025 | 16,215,588 | 22.0\% |
| 20073 | 270,302 | 73,134 | 27.1\% | 59,052,588 | 14,745,176 | 25.0\% |
| 20074 | 241,225 | 87,090 | 36.1\% | 52,962,735 | 18,524,466 | 35.0\% |
| 20081 | 215,990 | 98,927 | 45.8\% | 48,159,892 | 21,646,510 | 44.9\% |
| 20082 | 183,927 | 100,765 | 54.8\% | 40,110,502 | 21,735,600 | 54.2\% |
| 20083 | 135,285 | 66,306 | 49.0\% | 28,823,982 | 14,180,982 | 49.2\% |
| 20084 | 104,383 | 57,694 | 55.3\% | 22,005,413 | 12,434,001 | 56.5\% |
| 20091 | 94,543 | 62,619 | 66.2\% | 20,549,779 | 14,189,257 | 69.0\% |
| 20092 | 128,748 | 73,572 | 57.1\% | 28,964,725 | 17,133,840 | 59.2\% |
| 20093 | 125,941 | 52,867 | 42.0\% | 28,147,816 | 12,716,120 | 45.2\% |
| 20094 | 128,809 | 53,282 | 41.4\% | 29,066,803 | 12,925,881 | 44.5\% |
| 20101 | 108,373 | 41,596 | 38.4\% | 24,592,015 | 10,044,831 | 40.8\% |
| 20102 | 108,889 | 43,025 | 39.5\% | 24,195,057 | 10,149,633 | 41.9\% |
| 20103 | 144,347 | 55,854 | 38.7\% | 33,081,277 | 13,441,125 | 40.6\% |
| 20104 | 194,636 | 87,070 | 44.7\% | 45,191,533 | 20,557,354 | 45.5\% |
| 20111 | 118,853 | 48,025 | 40.4\% | 26,744,387 | 10,680,775 | 39.9\% |
| 20112 | 104,753 | 45,375 | 43.3\% | 23,142,935 | 10,076,550 | 43.5\% |
| 20113 | 122,813 | 62,691 | 51.0\% | 27,370,748 | 14,301,147 | 52.2\% |
| 20114 | 124,669 | 67,318 | 54.0\% | 27,592,861 | 15,323,035 | 55.5\% |
| Total | 7,042,718 | 2,699,258 | 38.3\% | 1,401,272,530 | 505,502,887 | 36.1\% |

*Annual rate cap of $2 \%$ or less, lifetime rate cap of $6 \%$ or less

|  | Developme | Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Book Year Dollars | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | $\frac{18-19}{10}$ | 19-20 | 20-21 |
| Ave | 17.03 | 3.71 | 2.49 | 2.07 | 1.77 | 1.76 | 1.55 | 1.49 | 1.39 | 1.33 | 1.28 | 1.23 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.08 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 14.96 | 3.68 | 2.49 | 1.99 | 1.74 | 1.69 | 1.53 | 1.46 | 1.37 | 1.32 | 1.27 | 1.22 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.08 |
| W A | 2.74 | 2.88 | 2.38 | 2.00 | 1.81 | 1.65 | 1.49 | 1.41 | 1.34 | 1.28 | 1.24 | 1.20 | 1.17 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| Ave '04-'11 | 17.27 | 3.72 | 2.58 | 2.00 | 1.74 | 1.60 | 1.47 | 1.40 | 1.34 | 1.27 | 1.23 | 1.20 | 1.17 | 1.15 | 1.13 | 1.12 | 1.11 | 1.10 | 1.09 | 1.08 |
| Ave $\times$ H/L '04-'11 | 14.79 | 3.70 | 2.58 | 1.99 | 1.74 | 1.59 | 1.46 | 1.39 | 1.33 | 1.27 | 1.23 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.10 | 1.10 | 1.09 |
| WA '04-'11 | 2.60 | 2.85 | 2.40 | 2.02 | 1.83 | 1.67 | 1.50 | 1.41 | 1.34 | 1.29 | 1.24 | 1.20 | 1.18 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 14.25 | 3.50 | 2.37 | 2.01 | 1.75 | 1.69 | 1.51 | 1.46 | 1.38 | 1.33 | 1.29 | 1.23 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.08 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 12.47 | 3.43 | 2.36 | 1.97 | 1.73 | 1.66 | 1.50 | 1.44 | 1.37 | 1.33 | 1.28 | 1.23 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.08 |
| WA | 2.67 | 2.63 | 2.23 | 1.90 | 1.72 | 1.59 | 1.46 | 1.38 | 1.33 | 1.28 | 1.24 | 1.20 | 1.17 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| Ave '04-11 | 14.65 | 3.52 | 2.42 | 1.93 | 1.69 | 1.56 | 1.44 | 1.37 | 1.32 | 1.26 | 1.23 | 1.19 | 1.16 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| Ave $\times$ H/L '04-'11 | 12.54 | 3.43 | 2.41 | 1.92 | 1.70 | 1.55 | 1.43 | 1.36 | 1.31 | 1.26 | 1.22 | 1.18 | 1.15 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| WA '04-'11 | 2.52 | 2.58 | 2.24 | 1.90 | 1.74 | 1.60 | 1.46 | 1.39 | 1.33 | 1.28 | 1.24 | 1.20 | 1.18 | 1.14 | 1.12 | 1.11 | 1.10 | 1.09 | 1.09 | 1.08 |
| Selection: | 14.08 | 4.47 | 2.80 | 2.16 | 1.84 | 1.65 | 1.52 | 1.43 | 1.36 | 1.31 | 1.26 | 1.23 | 1.20 | 1.18 | 1.16 | 1.14 | 1.13 | 1.12 | 1.10 | 1.09 |
| Development Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Dollars | 21-22 | 22-23 | 23-24 | 24-25 | 25-26 | 26-27 | 27-28 | 28-29 | 29-30 | 30-31 | 31-32 | 32-33 | 33-34 | 34-35 | 35-36 | 36-37 | 37-38 | 38-39 | 39-40 | 40-41 |
| Ave | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 |
| WA | 1.07 | 1.07 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.02 |
| Ave '04-11 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.06 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.00 |  |  |  |  |  |  |  |  |
| Ave $\times$ H/L '04-'11 | 1.08 | 1.08 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.06 |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 | 1.08 | 1.07 | 1.07 | 1.07 | 1.07 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.05 |  |  |  |  |  |  |  |  |  |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.02 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |
| WA | 1.07 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |
| Ave '04-11 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.06 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.00 |  |  |  |  |  |  |  |  |
| Ave $\times$ H/L '04-'11 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.06 |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 | 1.08 | 1.07 | 1.07 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.06 | 1.05 |  |  |  |  |  |  |  |  |  |
| Selection: | 1.09 | 1.08 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 |
| Development Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Dollars | 41-42 | 42-43 | 43-44 | 44-45 | 45-46 | 46-47 | 47-48 | 48-49 | 49-50 | 50-51 | 51-52 | 52-53 | 53-54 | 54-55 | 55-56 | 56-57 | 57-58 | 58-59 |  |  |
| Ave | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |  |  |  |  |  |  |  |  |  |
| W A | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.01 | 1.01 |  |  |  |  |  |  |  |  |
| Ave '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave $\times$ H/L '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.00 |  |  |  |  |  |  |  |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |  |  |  |  |  |  |  |  |  |
| WA | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.02 | 1.01 |  |  |  |  |  |  |  |  |
| Ave '04-11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave x H/L '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Selection: | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |

# United Guaranty Corporation 

Capital Analysis using Corelogic Servicing Database
All Loans
Paid LDF-Method

|  | A | B | $C=A * B$ |
| :---: | :---: | :---: | :---: |
|  | Cumulative |  | Indicated |
| Book | Default Rate |  | Ultimate |
| Year | as of 03/31/2012 | LDF | Default Rate |
| 19984 | 4.65\% | 1.040 | 4.84\% |
| 19991 | 4.89\% | 1.044 | 5.11\% |
| 19992 | 6.01\% | 1.049 | 6.30\% |
| 19993 | 7.56\% | 1.055 | 7.98\% |
| 19994 | 8.29\% | 1.061 | 8.80\% |
| 20001 | 9.66\% | 1.068 | 10.32\% |
| 20002 | 11.35\% | 1.075 | 12.20\% |
| 20003 | 10.37\% | 1.083 | 11.24\% |
| 20004 | 9.31\% | 1.093 | 10.17\% |
| 20011 | 5.49\% | 1.103 | 6.06\% |
| 20012 | 5.04\% | 1.114 | 5.62\% |
| 20013 | 5.48\% | 1.127 | 6.17\% |
| 20014 | 4.43\% | 1.141 | 5.05\% |
| 20021 | 4.71\% | 1.156 | 5.44\% |
| 20022 | 5.05\% | 1.173 | 5.92\% |
| 20023 | 4.10\% | 1.193 | 4.89\% |
| 20024 | 3.63\% | 1.214 | 4.41\% |
| 20031 | 3.61\% | 1.238 | 4.47\% |
| 20032 | 3.48\% | 1.264 | 4.40\% |
| 20033 | 3.92\% | 1.294 | 5.07\% |
| 20034 | 5.15\% | 1.327 | 6.83\% |
| 20041 | 5.64\% | 1.365 | 7.69\% |
| 20042 | 6.42\% | 1.407 | 9.03\% |
| 20043 | 8.42\% | 1.455 | 12.24\% |
| 20044 | 10.22\% | 1.508 | 15.41\% |

## United Guaranty Corporation

Capital Analysis using Corelogic Servicing Database
All Loans
Paid LDF-Method

|  | A | B | $C=A * B$ |
| :---: | :---: | :---: | :---: |
|  | Cumulative |  | Indicated |
| Book | Default Rate |  | Ultimate |
| Year | as of 03/31/2012 | LDF | Default Rate |
| 20051 | 12.02\% | 1.569 | 18.86\% |
| 20052 | 14.66\% | 1.639 | 24.04\% |
| 20053 | 17.20\% | 1.719 | 29.56\% |
| 20054 | 20.68\% | 1.810 | 37.44\% |
| 20061 | 22.10\% | 1.916 | 42.35\% |
| 20062 | 20.92\% | 2.039 | 42.65\% |
| 20063 | 20.70\% | 2.183 | 45.18\% |
| 20064 | 21.07\% | 2.352 | 49.56\% |
| 20071 | 19.79\% | 2.553 | 50.52\% |
| 20072 | 17.89\% | 2.794 | 49.99\% |
| 20073 | 15.82\% | 3.085 | 48.79\% |
| 20074 | 14.25\% | 3.441 | 49.03\% |
| 20081 | 9.72\% | 3.883 | 37.73\% |
| 20082 | 6.04\% | 4.438 | 26.79\% |
| 20083 | 4.50\% | 5.148 | 23.14\% |
| 20084 | 3.04\% | 6.072 | 18.47\% |
| 20091 | 2.26\% | 7.305 | 16.53\% |
| 20092 | 1.40\% | 8.991 | 12.63\% |
| 20093 | 1.03\% | 11.369 | 11.68\% |
| 20094 | 0.67\% | 14.847 | 9.89\% |
| 20101 | 0.60\% | 20.167 | 12.06\% |
| 20102 | 0.42\% | 28.762 | 11.95\% |
| 20103 | 0.26\% | 43.647 | 11.21\% |
| 20104 | 0.16\% | 71.858 | 11.35\% |
| 20111 | 0.27\% | 132.276 | 35.47\% |
| 20112 | 0.14\% | 286.338 | 39.07\% |
| 20113 | 0.02\% | 801.215 | 14.33\% |
| 20114 | 0.00\% | 3583.482 | 2.08\% |

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
All Loans
Unadjusted BF Method

A

| Book |
| :---: |
| Year |

19984
19991
19992
19993
19994
20001
20002
20003
20004
20011
20012
20013
20014
20021
20022
20023
20024
20031
20032
20033
20034
20041
20042
20043
20044

Unadjusted
A Priori Ultimate
Default Rate

B $\quad C=A$ * $(1-1 / L D)$

$$
D=B+C
$$

| Cumulative <br> Default Rate |
| ---: |
| as of 03/31/2012 |
| $4.65 \%$ |
| $4.89 \%$ |
| $6.01 \%$ |
| $7.56 \%$ |
| $8.29 \%$ |
| $9.66 \%$ |
| $11.35 \%$ |
| $10.37 \%$ |
| $9.31 \%$ |
| $5.49 \%$ |
| $5.04 \%$ |
| $5.48 \%$ |
| $4.43 \%$ |
| $4.71 \%$ |
| $5.05 \%$ |
| $4.10 \%$ |
| $3.63 \%$ |
| $3.61 \%$ |
| $3.48 \%$ |
| $3.92 \%$ |
| $5.15 \%$ |
| $5.64 \%$ |
| $6.42 \%$ |
| $8.42 \%$ |
| $10.22 \%$ |


| Indicated <br> Future Rate | Unadjusted <br> BF Indicated |
| ---: | ---: |
| as of 03/31/2012 |  | | $0.38 \%$ | $5.03 \%$ |
| ---: | ---: |
| $0.46 \%$ | $5.35 \%$ |
| $0.57 \%$ | $6.57 \%$ |
| $0.74 \%$ | $8.30 \%$ |
| $0.88 \%$ | $9.17 \%$ |
| $1.03 \%$ | $10.69 \%$ |
| $1.18 \%$ | $12.53 \%$ |
| $1.30 \%$ | $11.67 \%$ |
| $1.35 \%$ | $10.66 \%$ |
| $1.23 \%$ | $6.73 \%$ |
| $1.40 \%$ | $6.44 \%$ |
| $1.48 \%$ | $6.96 \%$ |
| $1.47 \%$ | $5.89 \%$ |
| $1.70 \%$ | $6.41 \%$ |
| $2.01 \%$ | $7.06 \%$ |
| $1.94 \%$ | $6.04 \%$ |
| $1.94 \%$ | $5.57 \%$ |
| $2.10 \%$ | $5.71 \%$ |
| $2.25 \%$ | $5.74 \%$ |
| $2.53 \%$ | $6.45 \%$ |
| $3.29 \%$ | $8.44 \%$ |
| $4.00 \%$ | $9.64 \%$ |
| $4.87 \%$ | $11.29 \%$ |
| $6.17 \%$ | $14.58 \%$ |
| $7.75 \%$ | $17.97 \%$ |

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
All Loans
Unadjusted BF Method

A

| Book | Unadjusted <br> Year Priori Ultimate <br> Default Rate |
| :---: | ---: |
| 20051 | $24.74 \%$ |
| 20052 | $29.33 \%$ |
| 20053 |  |
| 20054 | $30.86 \%$ |
| 20061 | $35.21 \%$ |
| 20062 | $37.60 \%$ |
| 20063 | $38.01 \%$ |
| 20064 | $38.79 \%$ |
| 20071 | $38.30 \%$ |
| 20072 | $40.03 \%$ |
| 20073 | $36.37 \%$ |
| 20074 | $33.97 \%$ |
| 20081 | $29.00 \%$ |
| 20082 | $23.51 \%$ |
| 20083 | $20.53 \%$ |
| 20084 | $21.54 \%$ |
| 20091 | $20.41 \%$ |
| 20092 | $13.63 \%$ |
| 20093 | $13.88 \%$ |

$$
C=A \text { * (1-1/LDF) } \quad D=B+C
$$

| Cumulative <br> Default Rate |
| ---: |
| as of 03/31/2012 |
| $12.02 \%$ |
| $14.66 \%$ |
| $17.20 \%$ |
| $20.68 \%$ |
| $22.10 \%$ |
| $20.92 \%$ |
| $20.70 \%$ |
| $21.07 \%$ |
| $19.79 \%$ |
| $17.89 \%$ |
| $15.82 \%$ |
| $14.25 \%$ |
| $9.72 \%$ |
| $6.04 \%$ |
| $4.50 \%$ |
| $3.04 \%$ |
| $2.26 \%$ |
| $1.40 \%$ |
| $1.03 \%$ |
| $0.67 \%$ |
| $0.60 \%$ |
| $0.42 \%$ |
| $0.26 \%$ |
| $0.16 \%$ |
| $0.27 \%$ |
| $0.14 \%$ |
| $0.02 \%$ |
| $0.00 \%$ |


| Indicated <br> Future Rate | Unadjusted <br> BF Indicated |
| ---: | ---: |
| as of 03/31/2012 |  | | $8.98 \%$ | $20.99 \%$ |
| ---: | ---: |
| $11.44 \%$ | $26.10 \%$ |
| $12.90 \%$ | $30.10 \%$ |
| $15.76 \%$ | $36.44 \%$ |
| $17.98 \%$ | $40.08 \%$ |
| $19.37 \%$ | $40.29 \%$ |
| $21.02 \%$ | $41.72 \%$ |
| $22.02 \%$ | $43.09 \%$ |
| $24.35 \%$ | $44.14 \%$ |
| $23.35 \%$ | $41.25 \%$ |
| $22.96 \%$ | $38.78 \%$ |
| $20.57 \%$ | $34.82 \%$ |
| $17.45 \%$ | $27.17 \%$ |
| $15.90 \%$ | $21.94 \%$ |
| $17.36 \%$ | $21.85 \%$ |
| $17.05 \%$ | $20.09 \%$ |
| $11.76 \%$ | $14.03 \%$ |
| $12.34 \%$ | $13.74 \%$ |
| $15.01 \%$ | $16.04 \%$ |
| $15.54 \%$ | $16.20 \%$ |
| $16.51 \%$ | $17.11 \%$ |
| $16.05 \%$ | $16.46 \%$ |
| $15.01 \%$ | $15.27 \%$ |
| $13.77 \%$ | $13.93 \%$ |
| $16.88 \%$ | $17.15 \%$ |
| $15.61 \%$ | $15.74 \%$ |
| $12.41 \%$ | $12.43 \%$ |
| $11.18 \%$ | $11.18 \%$ |



## Selected CV

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
All Loans
Adjusted Paid BF Method

|  | A | B | C | $D=B / C$ | $E=A * D$ | F | $G=E^{*}(1-1 / L D F)$ | $H=F+G$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Actual | Expected | Actual to |  |  |  | Adjusted |
|  |  | Percent | Percent | Expected | Adjusted | Cumulative | Indicated Future | BF Indicated |
| Book | A Priori | In-force | In-force | In-force | A Priori | Default Rate | Default Rate | Ultimate |
| Year | Ultimate | as of 03/31/2012 | as of 03/31/2012 | as of 03/31/2012 | Ultimate | as of 03/31/2012 | as of 03/31/2012 | Default Rate |
| 19984 | 9.97\% | 13.89\% | 11.80\% | 117.65\% | 11.73\% | 4.65\% | 0.45\% | 5.10\% |
| 19991 | 10.87\% | 12.04\% | 12.33\% | 97.69\% | 10.62\% | 4.89\% | 0.45\% | 5.34\% |
| 19992 | 12.05\% | 12.18\% | 12.88\% | 94.55\% | 11.39\% | 6.01\% | 0.53\% | 6.54\% |
| 19993 | 14.17\% | 11.32\% | 13.45\% | 84.17\% | 11.92\% | 7.56\% | 0.62\% | 8.18\% |
| 19994 | 15.34\% | 13.73\% | 14.05\% | 97.73\% | 15.00\% | 8.29\% | 0.86\% | 9.15\% |
| 20001 | 16.25\% | 14.30\% | 14.68\% | 97.43\% | 15.83\% | 9.66\% | 1.00\% | 10.67\% |
| 20002 | 16.91\% | 17.14\% | 15.33\% | 111.79\% | 18.91\% | 11.35\% | 1.32\% | 12.67\% |
| 20003 | 16.89\% | 14.65\% | 16.01\% | 91.47\% | 15.45\% | 10.37\% | 1.19\% | 11.56\% |
| 20004 | 15.92\% | 13.44\% | 16.73\% | 80.35\% | 12.79\% | 9.31\% | 1.08\% | 10.39\% |
| 20011 | 13.23\% | 11.01\% | 17.47\% | 63.01\% | 8.34\% | 5.49\% | 0.78\% | 6.27\% |
| 20012 | 13.65\% | 9.99\% | 18.25\% | 54.71\% | 7.47\% | 5.04\% | 0.77\% | 5.81\% |
| 20013 | 13.16\% | 11.26\% | 19.07\% | 59.04\% | 7.77\% | 5.48\% | 0.87\% | 6.35\% |
| 20014 | 11.91\% | 13.93\% | 19.91\% | 69.93\% | 8.33\% | 4.43\% | 1.03\% | 5.45\% |
| 20021 | 12.60\% | 12.55\% | 20.80\% | 60.34\% | 7.60\% | 4.71\% | 1.03\% | 5.73\% |
| 20022 | 13.59\% | 13.03\% | 21.73\% | 59.97\% | 8.15\% | 5.05\% | 1.20\% | 6.25\% |
| 20023 | 12.00\% | 15.71\% | 22.70\% | 69.22\% | 8.30\% | 4.10\% | 1.34\% | 5.44\% |
| 20024 | 10.98\% | 18.84\% | 23.71\% | 79.48\% | 8.73\% | 3.63\% | 1.54\% | 5.17\% |
| 20031 | 10.92\% | 23.24\% | 24.76\% | 93.86\% | 10.25\% | 3.61\% | 1.97\% | 5.58\% |
| 20032 | 10.78\% | 29.74\% | 25.87\% | 114.98\% | 12.39\% | 3.48\% | 2.59\% | 6.07\% |
| 20033 | 11.15\% | 32.75\% | 27.02\% | 121.20\% | 13.51\% | 3.92\% | 3.07\% | 6.99\% |
| 20034 | 13.34\% | 28.61\% | 28.22\% | 101.36\% | 13.52\% | 5.15\% | 3.34\% | 8.48\% |
| 20041 | 14.97\% | 34.11\% | 29.48\% | 115.71\% | 17.32\% | 5.64\% | 4.63\% | 10.27\% |
| 20042 | 16.84\% | 34.72\% | 30.79\% | 112.74\% | 18.98\% | 6.42\% | 5.49\% | 11.91\% |
| 20043 | 19.73\% | 34.05\% | 32.17\% | 105.85\% | 20.88\% | 8.42\% | 6.53\% | 14.94\% |
| 20044 | 22.99\% | 40.45\% | 33.60\% | 120.39\% | 27.68\% | 10.22\% | 9.33\% | 19.55\% |

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
All Loans
Adjusted Paid BF Method

|  | A | B | C | $D=B / C$ | $E=A * D$ | F | $G=E^{*}(1-1 / L D F)$ | $\mathrm{H}=\mathrm{F}+\mathrm{G}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Actual | Expected | Actual to |  |  |  | Adjusted |
|  |  | Percent | Percent | Expected | Adjusted | Cumulative | Indicated Future | BF Indicated |
| Book | A Priori | In-force | In-force | In-force | A Priori | Default Rate | Default Rate | Ultimate |
| Year | Ultimate | as of 03/31/2012 | as of 03/31/2012 | as of 03/31/2012 | Ultimate | as of 03/31/2012 | as of 03/31/2012 | Default Rate |
| 20051 | 24.74\% | 42.24\% | 35.10\% | 120.34\% | 29.77\% | 12.02\% | 10.80\% | 22.82\% |
| 20052 | 29.33\% | 44.73\% | 36.66\% | 122.02\% | 35.78\% | 14.66\% | 13.95\% | 28.62\% |
| 20053 | 30.86\% | 45.79\% | 38.29\% | 119.57\% | 36.89\% | 17.20\% | 15.43\% | 32.63\% |
| 20054 | 35.21\% | 43.12\% | 40.00\% | 107.81\% | 37.96\% | 20.68\% | 16.99\% | 37.67\% |
| 20061 | 37.60\% | 43.95\% | 41.78\% | 105.18\% | 39.55\% | 22.10\% | 18.91\% | 41.01\% |
| 20062 | 38.01\% | 43.51\% | 43.64\% | 99.69\% | 37.90\% | 20.92\% | 19.31\% | 40.23\% |
| 20063 | 38.79\% | 42.67\% | 45.59\% | 93.61\% | 36.31\% | 20.70\% | 19.68\% | 40.37\% |
| 20064 | 38.30\% | 46.63\% | 47.62\% | 97.92\% | 37.50\% | 21.07\% | 21.56\% | 42.63\% |
| 20071 | 40.03\% | 51.05\% | 49.74\% | 102.63\% | 41.08\% | 19.79\% | 24.99\% | 44.78\% |
| 20072 | 36.37\% | 50.00\% | 51.96\% | 96.24\% | 35.00\% | 17.89\% | 22.48\% | 40.37\% |
| 20073 | 33.97\% | 47.40\% | 54.27\% | 87.35\% | 29.67\% | 15.82\% | 20.06\% | 35.87\% |
| 20074 | 29.00\% | 48.59\% | 56.69\% | 85.71\% | 24.85\% | 14.25\% | 17.63\% | 31.88\% |
| 20081 | 23.51\% | 52.69\% | 59.21\% | 88.98\% | 20.92\% | 9.72\% | 15.53\% | 25.25\% |
| 20082 | 20.53\% | 49.96\% | 61.85\% | 80.78\% | 16.58\% | 6.04\% | 12.85\% | 18.88\% |
| 20083 | 21.54\% | 40.07\% | 64.61\% | 62.01\% | 13.36\% | 4.50\% | 10.76\% | 15.26\% |
| 20084 | 20.41\% | 49.47\% | 67.49\% | 73.30\% | 14.96\% | 3.04\% | 12.50\% | 15.54\% |
| 20091 | 13.63\% | 73.50\% | 70.49\% | 104.26\% | 14.21\% | 2.26\% | 12.26\% | 14.53\% |
| 20092 | 13.88\% | 81.64\% | 73.63\% | 110.87\% | 15.39\% | 1.40\% | 13.68\% | 15.09\% |
| 20093 | 16.46\% | 81.07\% | 76.91\% | 105.41\% | 17.35\% | 1.03\% | 15.82\% | 16.85\% |
| 20094 | 16.66\% | 84.43\% | 80.34\% | 105.09\% | 17.51\% | 0.67\% | 16.33\% | 16.99\% |
| 20101 | 17.37\% | 86.71\% | 83.79\% | 103.48\% | 17.98\% | 0.60\% | 17.09\% | 17.68\% |
| 20102 | 16.62\% | 87.50\% | 86.97\% | 100.61\% | 16.72\% | 0.42\% | 16.14\% | 16.56\% |
| 20103 | 15.36\% | 92.89\% | 89.87\% | 103.36\% | 15.88\% | 0.26\% | 15.52\% | 15.77\% |
| 20104 | 13.96\% | 95.79\% | 92.44\% | 103.62\% | 14.47\% | 0.16\% | 14.27\% | 14.43\% |
| 20111 | 17.01\% | 95.34\% | 94.66\% | 100.72\% | 17.13\% | 0.27\% | 17.00\% | 17.27\% |
| 20112 | 15.66\% | 95.59\% | 96.52\% | 99.04\% | 15.51\% | 0.14\% | 15.46\% | 15.59\% |
| 20113 | 12.43\% | 98.03\% | 97.99\% | 100.04\% | 12.43\% | 0.02\% | 12.42\% | 12.43\% |
| 20114 | 11.19\% | 99.42\% | 99.06\% | 100.36\% | 11.23\% | 0.00\% | 11.22\% | 11.22\% |

All Loans

Ultimate Default Rate Selections Evaluation as of 03/31/2012

| Book | Original | Percent of loans that are |
| :---: | :---: | :---: |
| Year | Loan Amount (\$000s) | Qualified Mortgages <br> (Amount) |
| 19984 | 5,725,397 | 48\% |
| 19991 | 4,962,599 | 50\% |
| 19992 | 4,816,568 | 46\% |
| 19993 | 3,384,091 | 46\% |
| 19994 | 2,258,999 | 46\% |
| 20001 | 1,423,255 | 42\% |
| 20002 | 1,488,966 | 44\% |
| 20003 | 1,800,167 | 51\% |
| 20004 | 2,244,833 | 52\% |
| 20011 | 5,834,443 | 52\% |
| 20012 | 8,438,898 | 53\% |
| 20013 | 7,527,453 | 50\% |
| 20014 | 11,826,282 | 50\% |
| 20021 | 10,395,551 | 49\% |
| 20022 | 10,888,558 | 47\% |
| 20023 | 17,827,570 | 49\% |
| 20024 | 25,563,653 | 50\% |
| 20031 | 25,369,849 | 51\% |
| 20032 | 34,533,311 | 51\% |
| 20033 | 33,991,443 | 47\% |
| 20034 | 20,345,652 | 39\% |
| 20041 | 22,986,818 | 37\% |
| 20042 | 27,135,007 | 33\% |
| 20043 | 24,551,812 | 28\% |
| 20044 | 26,505,813 | 25\% |

Original Loan

| Count |
| ---: |
| 49,611 |
| 42,547 |
| 41,766 |
| 29,921 |
| 20,526 |
| 13,209 |
| 14,060 |
| 16,500 |
| 19,922 |
| 45,921 |
| 65,084 |
| 57,734 |
| 87,637 |
| 76,998 |
| 80,358 |
| 124,631 |
| 172,257 |
| 168,196 |
| 221,225 |
| 216,445 |
| 131,287 |
| 139,650 |
| 161,797 |
| 142,506 |
| 142,820 |

\(\left.$$
\begin{array}{rrr}\text { Percent QM } & \begin{array}{r}\text { Cum. Default } \\
\text { Rate as }\end{array} & \begin{array}{r}\text { LDF Method } \\
\text { (Count) }\end{array}
$$ <br>

\hline 46 \% \& as of 03/31/2012\end{array} \quad $$
\begin{array}{r}\text { Default Rate }\end{array}
$$\right\}\)| $4.84 \%$ |
| ---: |
| $48 \%$ |


| Indicated Ultimate | Indicated Ultimate | Selected |
| :---: | :---: | :---: |
| Unadjusted BF | Adjusted BF | Ultimate |
| Default Rate | Default Rate | Default Rate |
| 5.03\% | 5.10\% | 4.84\% |
| 5.35\% | 5.34\% | 5.11\% |
| 6.57\% | 6.54\% | 6.30\% |
| 8.30\% | 8.18\% | 7.98\% |
| 9.17\% | 9.15\% | 8.80\% |
| 10.69\% | 10.67\% | 10.32\% |
| 12.53\% | 12.67\% | 12.20\% |
| 11.67\% | 11.56\% | 11.24\% |
| 10.66\% | 10.39\% | 10.17\% |
| 6.73\% | 6.27\% | 6.06\% |
| 6.44\% | 5.81\% | 5.62\% |
| 6.96\% | 6.35\% | 6.17\% |
| 5.89\% | 5.45\% | 5.05\% |
| 6.41\% | 5.73\% | 5.44\% |
| 7.06\% | 6.25\% | 5.92\% |
| 6.04\% | 5.44\% | 4.89\% |
| 5.57\% | 5.17\% | 4.41\% |
| 5.71\% | 5.58\% | 4.47\% |
| 5.74\% | 6.07\% | 4.40\% |
| 6.45\% | 6.99\% | 5.07\% |
| 8.44\% | 8.48\% | 6.83\% |
| 9.64\% | 10.27\% | 7.69\% |
| 11.29\% | 11.91\% | 9.03\% |
| 14.58\% | 14.94\% | 12.24\% |
| 17.97\% | 19.55\% | 15.41\% |

All Loans

Ultimate Default Rate Selections Evaluation as of 03/31/2012

|  | Original | Percent of loans that are |  |
| :---: | :---: | :---: | :---: |
| Book | Loan Amount | Qualified Mortgages | Original Loan |
| Year | (\$000s) | (Amount) | Count |
| 20051 | 26,273,959 | 24\% | 135,002 |
| 20052 | 40,668,737 | 21\% | 191,910 |
| 20053 | 48,439,563 | 22\% | 219,159 |
| 20054 | 41,438,093 | 19\% | 182,415 |
| 20061 | 38,243,128 | 17\% | 166,643 |
| 20062 | 47,781,799 | 17\% | 208,784 |
| 20063 | 47,797,681 | 18\% | 213,740 |
| 20064 | 50,998,310 | 19\% | 221,985 |
| 20071 | 54,503,199 | 19\% | 235,067 |
| 20072 | 73,546,025 | 22\% | 328,919 |
| 20073 | 59,052,588 | 25\% | 270,302 |
| 20074 | 52,962,735 | 35\% | 241,225 |
| 20081 | 48,159,892 | 45\% | 215,990 |
| 20082 | 40,110,502 | 54\% | 183,927 |
| 20083 | 28,823,982 | 49\% | 135,285 |
| 20084 | 22,005,413 | 57\% | 104,383 |
| 20091 | 20,549,779 | 69\% | 94,543 |
| 20092 | 28,964,725 | 59\% | 128,748 |
| 20093 | 28,147,816 | 45\% | 125,941 |
| 20094 | 29,066,803 | 44\% | 128,809 |
| 20101 | 24,592,015 | 41\% | 108,373 |
| 20102 | 24,195,057 | 42\% | 108,889 |
| 20103 | 33,081,277 | 41\% | 144,347 |
| 20104 | 45,191,533 | 45\% | 194,636 |
| 20111 | 26,744,387 | 40\% | 118,853 |
| 20112 | 23,142,935 | 44\% | 104,753 |
| 20113 | 27,370,748 | 52\% | 122,813 |
| 20114 | 27,592,861 | 56\% | 124,669 |
| Total | 1,401,272,530 | 36\% | 7,042,718 |


|  | Cum. Default <br> Rate as |  |
| ---: | ---: | ---: |
| Percent QM <br> (Count) | LDF Method <br> as of 03/31/2012 | Default Rate |
| $28 \%$ | $12.02 \%$ | $18.86 \%$ |
| $26 \%$ | $14.66 \%$ | $24.04 \%$ |
| $27 \%$ | $17.20 \%$ | $29.56 \%$ |
| $24 \%$ | $20.68 \%$ | $37.44 \%$ |
| $22 \%$ | $22.10 \%$ | $42.35 \%$ |
| $21 \%$ | $20.92 \%$ | $42.65 \%$ |
| $21 \%$ | $20.70 \%$ | $45.18 \%$ |
| $22 \%$ | $21.07 \%$ | $49.56 \%$ |
| $22 \%$ | $19.79 \%$ | $50.52 \%$ |
| $24 \%$ | $17.89 \%$ | $49.99 \%$ |
| $27 \%$ | $15.82 \%$ | $48.79 \%$ |
| $36 \%$ | $14.25 \%$ | $49.03 \%$ |
| $46 \%$ | $9.72 \%$ | $37.73 \%$ |
| $55 \%$ | $6.04 \%$ | $26.79 \%$ |
| $49 \%$ | $4.50 \%$ | $23.14 \%$ |
| $55 \%$ | $3.04 \%$ | $18.47 \%$ |
| $66 \%$ | $2.26 \%$ | $16.53 \%$ |
| $57 \%$ | $1.40 \%$ | $12.63 \%$ |
| $42 \%$ | $1.03 \%$ | $11.68 \%$ |
| $41 \%$ | $0.67 \%$ | $9.89 \%$ |
| $38 \%$ | $0.60 \%$ | $12.06 \%$ |
| $40 \%$ | $0.42 \%$ | $11.95 \%$ |
| $39 \%$ | $0.26 \%$ | $11.21 \%$ |
| $45 \%$ | $0.16 \%$ | $11.35 \%$ |
| $40 \%$ | $0.27 \%$ | $35.47 \%$ |
| $43 \%$ | $0.14 \%$ | $39.07 \%$ |
| $51 \%$ | $0.02 \%$ | $14.33 \%$ |
| $54 \%$ | $0.00 \%$ | $2.08 \%$ |
|  |  |  |
| $38 \%$ | $9.67 \%$ | $25.83 \%$ |
|  |  |  |


| Indicated Ultimate <br> Unadjusted BF <br> Default Rate | Indicated Ultimate <br> Adjusted BF <br> Default Rate | Selected <br> Ultimate <br> Default Rate |
| ---: | ---: | ---: |
| $20.99 \%$ | $22.82 \%$ | $22.82 \%$ |
| $26.10 \%$ | $28.62 \%$ | $28.62 \%$ |
| $30.10 \%$ | $32.63 \%$ | $32.63 \%$ |
| $36.44 \%$ | $37.67 \%$ | $37.67 \%$ |
| $40.08 \%$ | $41.01 \%$ | $41.01 \%$ |
| $40.29 \%$ | $40.23 \%$ | $40.23 \%$ |
| $41.72 \%$ | $40.37 \%$ | $40.37 \%$ |
| $43.09 \%$ | $42.63 \%$ | $42.63 \%$ |
| $44.14 \%$ | $44.78 \%$ | $44.78 \%$ |
| $41.25 \%$ | $40.37 \%$ | $40.37 \%$ |
| $38.78 \%$ | $35.87 \%$ | $35.87 \%$ |
| $34.82 \%$ | $31.88 \%$ | $31.88 \%$ |
| $27.17 \%$ | $25.25 \%$ | $25.25 \%$ |
| $21.94 \%$ | $18.88 \%$ | $18.88 \%$ |
| $21.85 \%$ | $15.26 \%$ | $15.26 \%$ |
| $20.09 \%$ | $15.54 \%$ | $15.54 \%$ |
| $14.03 \%$ | $14.53 \%$ | $14.53 \%$ |
| $13.74 \%$ | $15.09 \%$ | $15.09 \%$ |
| $16.04 \%$ | $16.85 \%$ | $16.85 \%$ |
| $16.20 \%$ | $16.99 \%$ | $16.99 \%$ |
| $17.11 \%$ | $17.68 \%$ | $17.68 \%$ |
| $16.46 \%$ | $16.56 \%$ | $16.56 \%$ |
| $15.27 \%$ | $15.77 \%$ | $15.77 \%$ |
| $13.93 \%$ | $14.43 \%$ | $14.43 \%$ |
| $17.15 \%$ | $17.27 \%$ | $17.27 \%$ |
| $15.74 \%$ | $15.59 \%$ | $15.59 \%$ |


|  | Developme | Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Book Year Dollars | 1-2 | $\underline{2-3}$ | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 |
| Ave | 8.25 | 3.70 | 2.51 | 1.92 | 1.71 | 1.72 | 1.48 | 1.42 | 1.40 | 1.31 | 1.25 | 1.23 | 1.19 | 1.16 | 1.15 | 1.14 | 1.11 | 1.10 | 1.10 | 1.09 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 6.32 | 3.46 | 2.42 | 1.91 | 1.69 | 1.65 | 1.46 | 1.41 | 1.34 | 1.30 | 1.25 | 1.22 | 1.19 | 1.16 | 1.15 | 1.13 | 1.11 | 1.10 | 1.09 | 1.09 |
| W A | 1.95 | 2.10 | 2.06 | 1.92 | 1.71 | 1.55 | 1.44 | 1.41 | 1.36 | 1.32 | 1.25 | 1.20 | 1.17 | 1.15 | 1.13 | 1.13 | 1.13 | 1.11 | 1.10 | 1.10 |
| Ave '04-'11 | 7.77 | 3.65 | 2.58 | 1.88 | 1.68 | 1.53 | 1.41 | 1.36 | 1.32 | 1.28 | 1.23 | 1.21 | 1.18 | 1.16 | 1.15 | 1.14 | 1.13 | 1.11 | 1.11 | 1.11 |
| Ave $\times$ H/L '04-'11 | 4.67 | 3.33 | 2.45 | 1.87 | 1.68 | 1.52 | 1.40 | 1.36 | 1.31 | 1.27 | 1.22 | 1.20 | 1.17 | 1.15 | 1.15 | 1.14 | 1.13 | 1.11 | 1.11 | 1.11 |
| WA '04-'11 | 1.79 | 1.97 | 2.06 | 1.97 | 1.73 | 1.59 | 1.47 | 1.44 | 1.38 | 1.34 | 1.26 | 1.21 | 1.17 | 1.15 | 1.14 | 1.14 | 1.14 | 1.12 | 1.12 | 1.12 |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 5.77 | 3.20 | 2.50 | 1.99 | 1.71 | 1.67 | 1.49 | 1.44 | 1.40 | 1.33 | 1.28 | 1.23 | 1.20 | 1.16 | 1.15 | 1.13 | 1.12 | 1.10 | 1.09 | 1.09 |
| Ave $\times$ H/L | 4.95 | 3.09 | 2.38 | 1.94 | 1.69 | 1.58 | 1.47 | 1.41 | 1.35 | 1.31 | 1.27 | 1.22 | 1.19 | 1.16 | 1.15 | 1.13 | 1.12 | 1.10 | 1.09 | 1.09 |
| WA | 1.91 | 2.03 | 2.00 | 1.91 | 1.69 | 1.54 | 1.43 | 1.39 | 1.35 | 1.31 | 1.25 | 1.20 | 1.17 | 1.15 | 1.13 | 1.13 | 1.12 | 1.10 | 1.10 | 1.09 |
| Ave '04-'11 | 5.10 | 3.22 | 2.54 | 1.90 | 1.69 | 1.53 | 1.41 | 1.36 | 1.32 | 1.28 | 1.23 | 1.21 | 1.17 | 1.15 | 1.15 | 1.13 | 1.13 | 1.11 | 1.11 | 1.10 |
| Ave $\times$ H/L '04-'11 | 3.68 | 3.06 | 2.37 | 1.90 | 1.68 | 1.51 | 1.40 | 1.35 | 1.31 | 1.27 | 1.22 | 1.20 | 1.17 | 1.15 | 1.15 | 1.13 | 1.13 | 1.11 | 1.11 | 1.10 |
| W A '04-'11 | 1.73 | 1.87 | 1.96 | 1.95 | 1.72 | 1.58 | 1.46 | 1.42 | 1.37 | 1.33 | 1.26 | 1.21 | 1.17 | 1.15 | 1.14 | 1.14 | 1.14 | 1.12 | 1.12 | 1.12 |
| Selection: | 18.74 | 5.26 | 3.13 | 2.35 | 1.97 | 1.74 | 1.59 | 1.48 | 1.40 | 1.34 | 1.30 | 1.26 | 1.23 | 1.20 | 1.18 | 1.16 | 1.14 | 1.13 | 1.12 | 1.10 |
| Development Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Dollars | 21-22 | 22-23 | 23-24 | 24-25 | 25-26 | 26-27 | 27-28 | 28-29 | 29-30 | 30-31 | 31-32 | 32-33 | 33-34 | 34-35 | 35-36 | 36-37 | 37-38 | 38-39 | 39-40 | 40-41 |
| Ave | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.07 | 1.07 | 1.07 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| WA | 1.09 | 1.08 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 |
| Ave '04-'11 | 1.10 | 1.09 | 1.09 | 1.08 | 1.09 | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.04 | 1.00 |  |  |  |  |  |  |  |  |
| Ave x H/L '04-'11 | 1.10 | 1.10 | 1.10 | 1.09 | 1.09 | 1.09 | 1.08 | 1.08 | 1.07 | 1.08 |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 | 1.11 | 1.10 | 1.11 | 1.10 | 1.10 | 1.09 | 1.09 | 1.09 | 1.08 | 1.09 | 1.09 |  |  |  |  |  |  |  |  |  |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 1.08 | 1.07 | 1.06 | 1.06 | 1.06 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 |
| Ave $\times$ H/L | 1.08 | 1.07 | 1.07 | 1.06 | 1.05 | 1.05 | 1.05 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 |
| W A | 1.08 | 1.07 | 1.07 | 1.06 | 1.06 | 1.06 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 1.01 |
| Ave '04-'11 | 1.10 | 1.09 | 1.08 | 1.08 | 1.08 | 1.08 | 1.06 | 1.06 | 1.06 | 1.06 | 1.04 | 1.00 |  |  |  |  |  |  |  |  |
| Ave $\times$ H/L '04-'11 | 1.10 | 1.09 | 1.09 | 1.08 | 1.08 | 1.08 | 1.07 | 1.07 | 1.07 | 1.07 |  |  |  |  |  |  |  |  |  |  |
| W A '04-'11 | 1.11 | 1.10 | 1.10 | 1.09 | 1.09 | 1.09 | 1.08 | 1.08 | 1.08 | 1.09 | 1.08 |  |  |  |  |  |  |  |  |  |
| Selection: | 1.09 | 1.09 | 1.08 | 1.07 | 1.06 | 1.06 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.03 | 1.03 | 1.03 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 |
| Development Quarter |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Dollars | 41-42 | 42-43 | 43-44 | 44-45 | 45-46 | 46-47 | 47-48 | 48-49 | 49-50 | 50-51 | 51-52 | 52-53 | 53-54 | 54-55 | 55-56 | 56-57 | 57-58 | 58-59 |  |  |
| Ave | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 |  |  |  |  |  |  |  |
| Ave $\times \mathrm{H} / \mathrm{L}$ | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.01 |  |  |  |  |  |  |  |  |  |
| W A | 1.01 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.02 | 1.01 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave $\times$ H/L '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Book Year Counts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.01 | 1.01 | 1.00 |  |  |  |  |  |  |  |
| Ave $\times$ H/L | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.01 |  |  |  |  |  |  |  |  |  |
| WA | 1.01 | 1.02 | 1.01 | 1.02 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.02 | 1.01 |  |  |  |  |  |  |  |  |
| Ave '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ave x H/L '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WA '04-'11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Selection: | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |  |

# United Guaranty Corporation 

Capital Analysis using Corelogic Servicing Database
QM Loans Only

Paid LDF-Method

|  | A | B | $C=A * B$ |
| :---: | :---: | :---: | :---: |
|  | Cumulative |  | Indicated |
| Book | Default Rate |  | Ultimate |
| Year | as of 03/31/2012 | LDF | Default Rate |
| 19984 | 3.08\% | 1.038 | 3.19\% |
| 19991 | 3.00\% | 1.042 | 3.13\% |
| 19992 | 3.76\% | 1.047 | 3.94\% |
| 19993 | 4.19\% | 1.053 | 4.41\% |
| 19994 | 5.83\% | 1.059 | 6.17\% |
| 20001 | 6.51\% | 1.066 | 6.94\% |
| 20002 | 7.87\% | 1.073 | 8.45\% |
| 20003 | 6.90\% | 1.082 | 7.46\% |
| 20004 | 6.46\% | 1.091 | 7.05\% |
| 20011 | 3.85\% | 1.102 | 4.24\% |
| 20012 | 3.28\% | 1.114 | 3.66\% |
| 20013 | 3.69\% | 1.127 | 4.15\% |
| 20014 | 3.04\% | 1.142 | 3.48\% |
| 20021 | 3.10\% | 1.158 | 3.59\% |
| 20022 | 3.03\% | 1.176 | 3.56\% |
| 20023 | 2.28\% | 1.197 | 2.72\% |
| 20024 | 2.16\% | 1.219 | 2.64\% |
| 20031 | 2.16\% | 1.245 | 2.69\% |
| 20032 | 2.01\% | 1.274 | 2.56\% |
| 20033 | 2.07\% | 1.306 | 2.71\% |
| 20034 | 2.65\% | 1.342 | 3.55\% |
| 20041 | 2.81\% | 1.383 | 3.89\% |
| 20042 | 2.64\% | 1.429 | 3.77\% |
| 20043 | 3.34\% | 1.481 | 4.94\% |
| 20044 | 4.02\% | 1.541 | 6.19\% |

## United Guaranty Corporation

Capital Analysis using Corelogic Servicing Database

> QM Loans Only

Paid LDF-Method


United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database

> QM Loans Only

Unadjusted BF Method

A

| Book |
| :---: |
| Year |

19984
19991
19992
19993
19994
20001
20002
20003
20004
20011
20012
20013
20014
20021
20022
20023
20024
20031
20032
20033
20034
20041
20042
20043
20044

Unadjusted
A Priori Ultimate
Default Rate
$2.98 \%$
$3.15 \%$
$3.69 \%$
$4.23 \%$
$4.52 \%$
$4.59 \%$
$4.71 \%$
$5.03 \%$
$5.23 \%$
$4.94 \%$
$5.33 \%$
$5.33 \%$
$4.89 \%$
$5.13 \%$
$5.54 \%$
$5.53 \%$
$5.59 \%$
$5.88 \%$
$6.10 \%$
$6.13 \%$
$6.95 \%$
$7.41 \%$
$7.84 \%$
$8.94 \%$
$9.94 \%$

B $\quad C=A$ * (1-1/LDF)
$D=B+C$

Indicated
Future Rate Default Rate as of $03 / 31 / 2012$
$3.08 \%$
$3.00 \%$
$3.76 \%$
$4.19 \%$
$5.83 \%$
$6.51 \%$
$7.87 \%$
$6.90 \%$
$6.46 \%$
$3.85 \%$
$3.28 \%$
$3.69 \%$
$3.04 \%$
$3.10 \%$
$3.03 \%$
$2.28 \%$
$2.16 \%$
$2.16 \%$
$2.01 \%$
$2.07 \%$
$2.65 \%$
$2.81 \%$
$2.64 \%$
$3.34 \%$
$4.02 \%$
as of 03/31/2012 Ultimate Default Rate

| $0.11 \%$ | $3.19 \%$ |
| :--- | :--- |
| $0.13 \%$ | $3.13 \%$ |
| $0.17 \%$ | $3.93 \%$ |
| $0.21 \%$ | $4.40 \%$ |
| $0.25 \%$ | $6.08 \%$ |
| $0.28 \%$ | $6.80 \%$ |
| $0.32 \%$ | $8.19 \%$ |
| $0.38 \%$ | $7.28 \%$ |
| $0.44 \%$ | $6.90 \%$ |
| $0.46 \%$ | $4.31 \%$ |
| $0.54 \%$ | $3.83 \%$ |
| $0.60 \%$ | $4.29 \%$ |
| $0.61 \%$ | $3.65 \%$ |
| $0.70 \%$ | $3.80 \%$ |
| $0.83 \%$ | $3.86 \%$ |
| $0.91 \%$ | $3.18 \%$ |
| $1.01 \%$ | $3.17 \%$ |
| $1.16 \%$ | $3.32 \%$ |
| $1.31 \%$ | $3.32 \%$ |
| $1.44 \%$ | $3.51 \%$ |
| $1.77 \%$ | $4.42 \%$ |
| $2.05 \%$ | $4.87 \%$ |
| $2.35 \%$ | $4.99 \%$ |
| $2.90 \%$ | $6.24 \%$ |
| $3.49 \%$ | $7.51 \%$ |

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database

> QM Loans Only

Unadjusted BF Method

A

| Book | Year <br> Aeadjusted |
| :---: | ---: |
| 20051 | Priori Ultimate <br> Default Rate |
| 20052 | $10.50 \%$ |
| 20053 | $11.20 \%$ |
| 20054 | $12.01 \%$ |
| 20061 | $13.62 \%$ |
| 20062 | $15.18 \%$ |
| 20063 | $15.36 \%$ |
| 20064 | $15.22 \%$ |
| 20071 | $15.56 \%$ |
| 20072 | $16.23 \%$ |
| 20073 | $15.79 \%$ |
| 20074 | $15.72 \%$ |
| 20081 | $14.51 \%$ |
| 20082 | $12.00 \%$ |
| 20083 | $10.75 \%$ |
| 20084 | $10.28 \%$ |
| 20091 | $9.61 \%$ |
| 20092 | $6.97 \%$ |
| 20093 | $5.87 \%$ |
| 20094 | $5.41 \%$ |
| 20101 | $5.10 \%$ |
| 20102 | $5.23 \%$ |

C $=A^{*}(1-1 /$ LDF $) \quad D=B+C$

| Cumulative <br> Default Rate | Indicated <br> Future Rate | Unadjusted <br> as Indicated |
| ---: | ---: | ---: |
| as of 03/31/2012 |  |  | Ultimate Default Rate



United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
QM Loans Only
Adjusted Paid BF Method

|  | A | B | C | $D=B / C$ | $E=A * D$ | F | $G=E^{*}(1-1 / L D F)$ | $\mathrm{H}=\mathrm{F}+\mathrm{G}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Actual | Expected | Actual to |  |  |  | Adjusted |
|  |  | Percent | Percent | Expected | Adjusted | Cumulative | Indicated Future | BF Indicated |
| Book | A Priori | In-force | In-force | In-force | A Priori | Default Rate | Default Rate | Ultimate |
| Year | Ultimate | as of 03/31/2012 | as of 03/31/2012 | as of 03/31/2012 | Ultimate | as of 03/31/2012 | as of 03/31/2012 | Default Rate |
| 19984 | 2.98\% | 13.87\% | 11.80\% | 117.53\% | 3.50\% | 3.08\% | 0.13\% | 3.20\% |
| 19991 | 3.15\% | 10.90\% | 12.33\% | 88.41\% | 2.79\% | 3.00\% | 0.11\% | 3.12\% |
| 19992 | 3.69\% | 10.46\% | 12.88\% | 81.21\% | 3.00\% | 3.76\% | 0.14\% | 3.90\% |
| 19993 | 4.23\% | 8.43\% | 13.45\% | 62.67\% | 2.65\% | 4.19\% | 0.13\% | 4.32\% |
| 19994 | 4.52\% | 9.52\% | 14.05\% | 67.76\% | 3.06\% | 5.83\% | 0.17\% | 6.00\% |
| 20001 | 4.59\% | 10.71\% | 14.68\% | 72.96\% | 3.35\% | 6.51\% | 0.21\% | 6.72\% |
| 20002 | 4.71\% | 10.88\% | 15.33\% | 70.99\% | 3.34\% | 7.87\% | 0.23\% | 8.10\% |
| 20003 | 5.03\% | 9.10\% | 16.01\% | 56.84\% | 2.86\% | 6.90\% | 0.22\% | 7.12\% |
| 20004 | 5.23\% | 9.54\% | 16.73\% | 57.01\% | 2.98\% | 6.46\% | 0.25\% | 6.71\% |
| 20011 | 4.94\% | 9.20\% | 17.47\% | 52.66\% | 2.60\% | 3.85\% | 0.24\% | 4.09\% |
| 20012 | 5.33\% | 7.60\% | 18.25\% | 41.62\% | 2.22\% | 3.28\% | 0.23\% | 3.51\% |
| 20013 | 5.33\% | 8.93\% | 19.07\% | 46.82\% | 2.49\% | 3.69\% | 0.28\% | 3.97\% |
| 20014 | 4.89\% | 12.36\% | 19.91\% | 62.05\% | 3.03\% | 3.04\% | 0.38\% | 3.42\% |
| 20021 | 5.13\% | 11.40\% | 20.80\% | 54.82\% | 2.81\% | 3.10\% | 0.38\% | 3.48\% |
| 20022 | 5.54\% | 11.27\% | 21.73\% | 51.86\% | 2.87\% | 3.03\% | 0.43\% | 3.46\% |
| 20023 | 5.53\% | 13.91\% | 22.70\% | 61.27\% | 3.39\% | 2.28\% | 0.56\% | 2.83\% |
| 20024 | 5.59\% | 17.49\% | 23.71\% | 73.78\% | 4.12\% | 2.16\% | 0.74\% | 2.91\% |
| 20031 | 5.88\% | 21.91\% | 24.76\% | 88.48\% | 5.21\% | 2.16\% | 1.02\% | 3.18\% |
| 20032 | 6.10\% | 29.46\% | 25.87\% | 113.89\% | 6.95\% | 2.01\% | 1.49\% | 3.50\% |
| 20033 | 6.13\% | 34.07\% | 27.02\% | 126.11\% | 7.73\% | 2.07\% | 1.81\% | 3.88\% |
| 20034 | 6.95\% | 29.68\% | 28.22\% | 105.17\% | 7.31\% | 2.65\% | 1.86\% | 4.51\% |
| 20041 | 7.41\% | 34.95\% | 29.48\% | 118.54\% | 8.79\% | 2.81\% | 2.43\% | 5.25\% |
| 20042 | 7.84\% | 34.62\% | 30.79\% | 112.43\% | 8.81\% | 2.64\% | 2.65\% | 5.29\% |
| 20043 | 8.94\% | 34.09\% | 32.17\% | 105.97\% | 9.47\% | 3.34\% | 3.08\% | 6.41\% |
| 20044 | 9.94\% | 44.23\% | 33.60\% | 131.63\% | 13.09\% | 4.02\% | 4.59\% | 8.61\% |

United Guaranty Corporation
Capital Analysis using Corelogic Servicing Database
QM Loans Only
Adjusted Paid BF Method

|  | A | B | C | $D=B / C$ | $E=A * D$ | F | $\mathrm{G}=\mathrm{E}^{*}(1-1 / \mathrm{LDF})$ | $\mathrm{H}=\mathrm{F}+\mathrm{G}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Actual | Expected | Actual to |  |  |  | Adjusted |
|  |  | Percent | Percent | Expected | Adjusted | Cumulative | Indicated Future | BF Indicated |
| Book | A Priori | In-force | In-force | In-force | A Priori | Default Rate | Default Rate | Ultimate |
| Year | Ultimate | as of 03/31/2012 | as of 03/31/2012 | as of 03/31/2012 | Ultimate | as of 03/31/2012 | as of 03/31/2012 | Default Rate |
| 20051 | 10.50\% | 45.87\% | 35.10\% | 130.71\% | 13.72\% | 4.43\% | 5.19\% | 9.62\% |
| 20052 | 11.20\% | 47.31\% | 36.66\% | 129.05\% | 14.45\% | 5.09\% | 5.88\% | 10.97\% |
| 20053 | 12.01\% | 49.79\% | 38.29\% | 130.01\% | 15.61\% | 5.68\% | 6.82\% | 12.51\% |
| 20054 | 13.62\% | 47.47\% | 40.00\% | 118.68\% | 16.17\% | 6.89\% | 7.57\% | 14.46\% |
| 20061 | 15.18\% | 47.27\% | 41.78\% | 113.12\% | 17.17\% | 7.91\% | 8.59\% | 16.49\% |
| 20062 | 15.36\% | 44.62\% | 43.64\% | 102.23\% | 15.70\% | 7.77\% | 8.37\% | 16.14\% |
| 20063 | 15.22\% | 42.22\% | 45.59\% | 92.61\% | 14.10\% | 7.27\% | 7.99\% | 15.25\% |
| 20064 | 15.56\% | 48.77\% | 47.62\% | 102.41\% | 15.93\% | 6.97\% | 9.57\% | 16.54\% |
| 20071 | 16.23\% | 51.08\% | 49.74\% | 102.68\% | 16.67\% | 7.77\% | 10.59\% | 18.35\% |
| 20072 | 15.79\% | 51.11\% | 51.96\% | 98.37\% | 15.53\% | 7.39\% | 10.40\% | 17.78\% |
| 20073 | 15.72\% | 48.47\% | 54.27\% | 89.32\% | 14.04\% | 8.09\% | 9.88\% | 17.97\% |
| 20074 | 14.51\% | 49.29\% | 56.69\% | 86.95\% | 12.62\% | 8.86\% | 9.30\% | 18.16\% |
| 20081 | 12.00\% | 54.89\% | 59.21\% | 92.70\% | 11.12\% | 5.86\% | 8.56\% | 14.43\% |
| 20082 | 10.75\% | 51.99\% | 61.85\% | 84.05\% | 9.04\% | 3.76\% | 7.24\% | 11.01\% |
| 20083 | 10.28\% | 42.04\% | 64.61\% | 65.07\% | 6.69\% | 2.78\% | 5.56\% | 8.35\% |
| 20084 | 9.61\% | 49.82\% | 67.49\% | 73.83\% | 7.10\% | 1.66\% | 6.10\% | 7.76\% |
| 20091 | 6.97\% | 73.43\% | 70.49\% | 104.16\% | 7.26\% | 0.89\% | 6.43\% | 7.33\% |
| 20092 | 5.87\% | 81.06\% | 73.63\% | 110.09\% | 6.47\% | 0.46\% | 5.88\% | 6.34\% |
| 20093 | 5.41\% | 78.19\% | 76.91\% | 101.66\% | 5.50\% | 0.35\% | 5.11\% | 5.46\% |
| 20094 | 5.10\% | 81.12\% | 80.34\% | 100.97\% | 5.15\% | 0.19\% | 4.88\% | 5.07\% |
| 20101 | 5.23\% | 82.36\% | 83.79\% | 98.29\% | 5.14\% | 0.12\% | 4.95\% | 5.07\% |
| 20102 | 4.58\% | 83.23\% | 86.97\% | 95.70\% | 4.39\% | 0.10\% | 4.28\% | 4.37\% |
| 20103 | 4.97\% | 91.06\% | 89.87\% | 101.32\% | 5.03\% | 0.05\% | 4.95\% | 5.00\% |
| 20104 | 4.91\% | 95.03\% | 92.44\% | 102.80\% | 5.05\% | 0.05\% | 5.00\% | 5.05\% |
| 20111 | 4.26\% | 92.87\% | 94.66\% | 98.11\% | 4.18\% | 0.17\% | 4.16\% | 4.34\% |
| 20112 | 3.73\% | 93.38\% | 96.52\% | 96.75\% | 3.61\% | 0.09\% | 3.60\% | 3.69\% |
| 20113 | 3.45\% | 97.67\% | 97.99\% | 99.68\% | 3.44\% | 0.01\% | 3.44\% | 3.45\% |
| 20114 | 3.32\% | 99.54\% | 99.06\% | 100.49\% | 3.34\% | 0.00\% | 3.34\% | 3.34\% |

United Guaranty Corporation

Evaluation as of 03/31/2012

| Book | Original <br> Loan Amount | Percent of loans that are Qualified Mortgages |
| :---: | :---: | :---: |
| Year | (\$000s) | (Amount) |
| 19984 | 2,732,034 | 100\% |
| 19991 | 2,464,921 | 100\% |
| 19992 | 2,232,712 | 100\% |
| 19993 | 1,541,201 | 100\% |
| 19994 | 1,049,562 | 100\% |
| 20001 | 594,673 | 100\% |
| 20002 | 659,442 | 100\% |
| 20003 | 922,617 | 100\% |
| 20004 | 1,173,765 | 100\% |
| 20011 | 3,030,121 | 100\% |
| 20012 | 4,511,614 | 100\% |
| 20013 | 3,751,412 | 100\% |
| 20014 | 5,872,753 | 100\% |
| 20021 | 5,108,902 | 100\% |
| 20022 | 5,065,121 | 100\% |
| 20023 | 8,726,207 | 100\% |
| 20024 | 12,831,226 | 100\% |
| 20031 | 12,871,674 | 100\% |
| 20032 | 17,496,587 | 100\% |
| 20033 | 16,080,073 | 100\% |
| 20034 | 7,969,892 | 100\% |
| 20041 | 8,543,585 | 100\% |
| 20042 | 8,951,480 | 100\% |
| 20043 | 6,791,680 | 100\% |
| 20044 | 6,593,991 | 100\% |

Original Loan
$\underline{\text { Count }}$
22,851
20,242
18,485
13,187
9,359
5,536
6,226
8,276
10,153
23,416
33,856
28,662
43,570
37,835
37,185
60,519
86,357
85,736
113,711
105,323
53,612
56,202
58,452
44,246
41,016

| Percent QM |
| ---: |
| (Count) |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
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| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |
| $100 \%$ |


| Cum. Default |  |
| :---: | :---: |
| Rate as | LDF Method |
| as of 03/31/2012 | Default Rate |
| 3.08\% | 3.19\% |
| 3.00\% | 3.13\% |
| 3.76\% | 3.94\% |
| 4.19\% | 4.41\% |
| 5.83\% | 6.17\% |
| 6.51\% | 6.94\% |
| 7.87\% | 8.45\% |
| 6.90\% | 7.46\% |
| 6.46\% | 7.05\% |
| 3.85\% | 4.24\% |
| 3.28\% | 3.66\% |
| 3.69\% | 4.15\% |
| 3.04\% | 3.48\% |
| 3.10\% | 3.59\% |
| 3.03\% | 3.56\% |
| 2.28\% | 2.72\% |
| 2.16\% | 2.64\% |
| 2.16\% | 2.69\% |
| 2.01\% | 2.56\% |
| 2.07\% | 2.71\% |
| 2.65\% | 3.55\% |
| 2.81\% | 3.89\% |
| 2.64\% | 3.77\% |
| 3.34\% | 4.94\% |
| 4.02\% | 6.19\% |


| Indicated Ultimate <br> Unadjusted BF <br> Default Rate | Indicated Ultimate <br> Adjusted BF <br> Default Rate | Selected <br> Ultimate <br> Default Rate |
| ---: | ---: | ---: |
| $3.19 \%$ | $3.20 \%$ | $3.19 \%$ |
| $3.13 \%$ | $3.12 \%$ | $3.13 \%$ |
| $3.93 \%$ | $3.90 \%$ | $3.94 \%$ |
| $4.40 \%$ | $4.32 \%$ | $4.41 \%$ |
| $6.08 \%$ | $6.00 \%$ | $6.17 \%$ |
| $6.80 \%$ | $6.72 \%$ | $6.94 \%$ |
| $8.19 \%$ | $8.10 \%$ | $8.45 \%$ |
| $7.28 \%$ | $7.12 \%$ | $7.46 \%$ |
| $6.90 \%$ | $6.71 \%$ | $7.05 \%$ |
| $4.31 \%$ | $4.09 \%$ | $4.24 \%$ |
| $3.83 \%$ | $3.51 \%$ | $3.66 \%$ |
| $4.29 \%$ | $3.97 \%$ | $4.15 \%$ |
| $3.65 \%$ | $3.42 \%$ | $3.48 \%$ |
| $3.80 \%$ | $3.48 \%$ | $3.59 \%$ |
| $3.86 \%$ | $3.46 \%$ | $3.56 \%$ |
| $3.18 \%$ | $2.83 \%$ | $2.72 \%$ |
| $3.17 \%$ | $2.91 \%$ | $2.64 \%$ |
| $3.32 \%$ | $3.18 \%$ | $2.69 \%$ |
| $3.32 \%$ | $3.50 \%$ | $2.56 \%$ |
| $3.51 \%$ | $3.88 \%$ | $2.71 \%$ |
| $4.42 \%$ | $4.51 \%$ | $3.55 \%$ |
| $4.87 \%$ | $5.25 \%$ | $3.89 \%$ |
| $4.99 \%$ | $5.29 \%$ | $3.77 \%$ |
| $6.24 \%$ | $6.41 \%$ | $4.94 \%$ |
| $7.51 \%$ | $8.61 \%$ | $6.19 \%$ |

United Guaranty Corporation

Evaluation as of 03/31/2012

|  | Original | Percent of loans that are |  |
| :---: | :---: | :---: | :---: |
| Book | Loan Amount | Qualified Mortgages | Original Loan |
| Year | (\$000s) | (Amount) | Count |
| 20051 | 6,392,548 | 100\% | 38,345 |
| 20052 | 8,696,218 | 100\% | 50,259 |
| 20053 | 10,749,097 | 100\% | 59,743 |
| 20054 | 7,866,798 | 100\% | 43,734 |
| 20061 | 6,617,219 | 100\% | 36,482 |
| 20062 | 8,000,315 | 100\% | 42,944 |
| 20063 | 8,567,663 | 100\% | 45,855 |
| 20064 | 9,457,489 | 100\% | 48,760 |
| 20071 | 10,566,419 | 100\% | 52,506 |
| 20072 | 16,215,588 | 100\% | 79,407 |
| 20073 | 14,745,176 | 100\% | 73,134 |
| 20074 | 18,524,466 | 100\% | 87,090 |
| 20081 | 21,646,510 | 100\% | 98,927 |
| 20082 | 21,735,600 | 100\% | 100,765 |
| 20083 | 14,180,982 | 100\% | 66,306 |
| 20084 | 12,434,001 | 100\% | 57,694 |
| 20091 | 14,189,257 | 100\% | 62,619 |
| 20092 | 17,133,840 | 100\% | 73,572 |
| 20093 | 12,716,120 | 100\% | 52,867 |
| 20094 | 12,925,881 | 100\% | 53,282 |
| 20101 | 10,044,831 | 100\% | 41,596 |
| 20102 | 10,149,633 | 100\% | 43,025 |
| 20103 | 13,441,125 | 100\% | 55,854 |
| 20104 | 20,557,354 | 100\% | 87,070 |
| 20111 | 10,680,775 | 100\% | 48,025 |
| 20112 | 10,076,550 | 100\% | 45,375 |
| 20113 | 14,301,147 | 100\% | 62,691 |
| 20114 | 15,323,035 | 100\% | 67,318 |
| Total | 505,502,887 | 100\% | 2,699,258 |


| Cum. Default |  |  |
| :---: | :---: | :---: |
| Percent QM | Rate as | LDF Method |
| (Count) | as of 03/31/2012 | Default Rate |
| 100\% | 4.43\% | 7.13\% |
| 100\% | 5.09\% | 8.58\% |
| 100\% | 5.68\% | 10.10\% |
| 100\% | 6.89\% | 12.95\% |
| 100\% | 7.91\% | 15.81\% |
| 100\% | 7.77\% | 16.65\% |
| 100\% | 7.27\% | 16.77\% |
| 100\% | 6.97\% | 17.45\% |
| 100\% | 7.77\% | 21.28\% |
| 100\% | 7.39\% | 22.34\% |
| 100\% | 8.09\% | 27.28\% |
| 100\% | 8.86\% | 33.73\% |
| 100\% | 5.86\% | 25.48\% |
| 100\% | 3.76\% | 18.96\% |
| 100\% | 2.78\% | 16.52\% |
| 100\% | 1.66\% | 11.80\% |
| 100\% | 0.89\% | 7.82\% |
| 100\% | 0.46\% | 5.03\% |
| 100\% | 0.35\% | 4.97\% |
| 100\% | 0.19\% | 3.55\% |
| 100\% | 0.12\% | 3.23\% |
| 100\% | 0.10\% | 3.81\% |
| 100\% | 0.05\% | 3.21\% |
| 100\% | 0.05\% | 5.02\% |
| 100\% | 0.17\% | 37.45\% |
| 100\% | 0.09\% | 43.99\% |
| 100\% | 0.01\% | 16.24\% |
| 100\% | 0.00\% | 0.00\% |
| 100\% | 3.22\% | 11.77\% |


| Indicated Ultimate | Indicated Ultimate | Selected |
| :---: | :---: | :---: |
| Unadjusted BF | Adjusted BF | Ultimate |
| Default Rate | Default Rate | Default Rate |
| 8.40\% | 9.62\% | 9.62\% |
| 9.65\% | 10.97\% | 10.97\% |
| 10.93\% | 12.51\% | 12.51\% |
| 13.27\% | 14.46\% | 14.46\% |
| 15.49\% | 16.49\% | 16.49\% |
| 15.96\% | 16.14\% | 16.14\% |
| 15.89\% | 15.25\% | 15.25\% |
| 16.31\% | 16.54\% | 16.54\% |
| 18.07\% | 18.35\% | 18.35\% |
| 17.96\% | 17.78\% | 17.78\% |
| 19.15\% | 17.97\% | 17.97\% |
| 19.56\% | 18.16\% | 18.16\% |
| 15.10\% | 14.43\% | 14.43\% |
| 12.38\% | 11.01\% | 11.01\% |
| 11.33\% | 8.35\% | 8.35\% |
| 9.92\% | 7.76\% | 7.76\% |
| 7.07\% | 7.33\% | 7.33\% |
| 5.80\% | 6.34\% | 6.34\% |
| 5.38\% | 5.46\% | 5.46\% |
| 5.02\% | 5.07\% | 5.07\% |
| 5.15\% | 5.07\% | 5.07\% |
| 4.56\% | 4.37\% | 4.37\% |
| 4.94\% | 5.00\% | 5.00\% |
| 4.91\% | 5.05\% | 5.05\% |
| 4.42\% | 4.34\% | 4.34\% |
| 3.81\% | 3.69\% | 3.69\% |
| 3.46\% | 3.45\% | 3.45\% |
| 3.32\% | 3.34\% | 3.34\% |
| 8.47\% | 8.30\% | 8.10\% |
| Average |  | 7.42\% |
| Average $\times \mathrm{H} / \mathrm{L}$ |  | 7.30\% |
| Avg L5 Years |  | 8.61\% |

## United Guaranty Corporation

Capital Analysis using Corelogic Servicing Database Ultimate Default Rate Distribution by for All Loans and QM Loans

Corelogic Servicing Data 1998-2012

| Confidence | All Loans |  | QM Loans Only |  |
| :---: | :---: | :---: | :---: | :---: |
| Level | Empirical | Gamma Fit | Empirical | Gamma Fit |
| 10\% | 5.0\% | 3.5\% | 3.1\% | 1.9\% |
| 20\% | 5.9\% | 5.9\% | 3.6\% | 2.9\% |
| 30\% | 7.7\% | 8.2\% | 3.8\% | 3.9\% |
| 40\% | 11.2\% | 10.7\% | 4.4\% | 5.0\% |
| 50\% | 14.4\% | 13.4\% | 5.1\% | 6.1\% |
| 60\% | 15.5\% | 16.5\% | 6.3\% | 7.3\% |
| 70\% | 17.3\% | 20.4\% | 8.3\% | 8.9\% |
| 80\% | 28.6\% | 25.6\% | 12.5\% | 11.0\% |
| 90\% | 40.2\% | 34.2\% | 16.5\% | 14.3\% |
| 95\% | 41.0\% | 42.5\% | 18.0\% | 17.5\% |
| 99\% | 44.8\% | 61.2\% | 18.4\% | 24.6\% |
| Average Ultimate Default Rate or Distribution Mean | 16.7\% | 16.7\% | 7.4\% | 7.3\% |
| Standard Deviation | 12.2\% | 13.2\% | 5.0\% | 5.3\% |
| 2007 Ultimate Default Rate | 38.2\% |  | 18.1\% |  |
| 2007 Ultimate Default Rate Percentile | 88.7\% | 92.8\% | 96.2\% | 95.6\% |








## United Guaranty Corporation

Capital Analysis using Corelogic Servicing Database
Risk to Capital Ratio Comparison: Qualified Mortgages
No Required Capital Over Contingency Reserve, No Expenses, No Investment Income, No Taxes
Single Book Analysis
(\$000's)

## Ultimate Default Rate

Premium Rate
Coverage Percent

Original NIW
Original Risk

Confidence Level

| 10\% | 1.9\% | 1.9\% | 17.6\% | 18.8\% | 0 | 0 | NA | NA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20\% | 3.0\% | 3.0\% | 25.6\% | 27.5\% | 0 | 0 | NA | NA |
| 30\% | 4.0\% | 4.0\% | 32.5\% | 34.8\% | 0 | 0 | NA | NA |
| 40\% | 5.0\% | 5.0\% | 39.2\% | 42.0\% | 0 | 0 | NA | NA |
| 50\% | 6.1\% | 6.1\% | 46.3\% | 49.6\% | 0 | 0 | NA | NA |
| 60\% | 7.4\% | 7.4\% | 54.1\% | 57.9\% | 0 | 0 | NA | NA |
| 70\% | 9.0\% | 9.0\% | 63.4\% | 67.8\% | 0 | 0 | NA | NA |
| 80\% | 11.1\% | 11.1\% | 75.6\% | 80.8\% | 0 | 0 | NA | NA |
| 90\% | 14.4\% | 14.4\% | 95.0\% | 101.6\% | 0 | 5,067 | NA | 493.4 |
| 95\% | 17.5\% | 17.5\% | 113.3\% | 121.2\% | 47,263 | 71,236 | 52.9 | 35.1 |
| 97.5\% | 20.9\% | 20.9\% | 131.5\% | 140.8\% | 114,669 | 138,738 | 21.8 | 18.0 |
| 99.0\% | 24.7\% | 24.7\% | 152.2\% | 162.7\% | 200,877 | 223,519 | 12.4 | 11.2 |
| 99.5\% | 27.4\% | 27.4\% | 170.6\% | 182.5\% | 267,074 | 292,444 | 9.4 | 8.5 |
| 99.9\% | 34.9\% | 34.9\% | 209.5\% | 224.1\% | 435,668 | 464,215 | 5.7 | 5.4 |
| Average | 7.3\% | 7.3\% | 52.4\% | 56.1\% | 7,943 | 10,197 | 314.7 | 245.2 |
| Percent of Trials Resulting in Zero Capital Contribution |  |  |  |  | 92\% | 89\% | 92\% | 89\% |

## United Guaranty Corporation

Capital Analysis using Corelogic Servicing Database
Risk to Capital Ratio Comparison: Qualified Mortgages
No Required Capital Over Contingency Reserve, 20\% Expense Ratio, 3\% Investment Yield, 35\% Tax Rate Multi Book Analysis
(\$000's)

|  | Ultimate Default Rate |  | Loss Ratio |  | Contributed Capital |  | Risk to Contributed Capital Ratio* |  | Risk to Capital Ratio** |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Premium Rate | 0.75\% | 0.70\% | 0.75\% | 0.70\% | 0.75\% | 0.70\% | 0.75\% | 0.70\% | 0.75\% | 0.70\% |
| Coverage Percent | 25\% | 25.0\% | 25\% | 25.0\% | 25\% | 25.0\% | 25\% | 25.0\% | 25\% | 25.0\% |
| Total NIW for All Books |  |  |  |  |  |  | 150,000,000 | 150,000,000 | 150,000,000 | 150,000,000 |
| Original Risk for All Books |  |  |  |  |  |  | 37,500,000 | 37,500,000 | 37,500,000 | 37,500,000 |
| Confidence Level |  |  |  |  |  |  |  |  |  |  |
| 10\% | 3.1\% | 3.1\% | 20.8\% | 22.3\% | 0 | 0 | NA | NA | - | - |
| 20\% | 4.1\% | 4.1\% | 26.9\% | 28.8\% | 0 | 0 | NA | NA | - | - |
| 30\% | 4.9\% | 4.9\% | 32.3\% | 34.5\% | 0 | 0 | NA | NA | - | - |
| 40\% | 5.8\% | 5.8\% | 37.3\% | 40.0\% | 0 | 0 | NA | NA | - | - |
| 50\% | 6.6\% | 6.6\% | 42.1\% | 45.1\% | 0 | 0 | NA | NA | - | - |
| 60\% | 7.6\% | 7.6\% | 47.4\% | 50.7\% | 0 | 0 | NA | NA | - | - |
| 70\% | 8.7\% | 8.7\% | 53.6\% | 57.4\% | 0 | 0 | NA | NA | - | - |
| 80\% | 10.1\% | 10.1\% | 61.8\% | 66.2\% | 0 | 0 | NA | NA | - | - |
| 90\% | 12.4\% | 12.4\% | 73.7\% | 78.9\% | 0 | 0 | NA | NA | - | - |
| 95\% | 14.5\% | 14.5\% | 85.4\% | 91.5\% | 0 | 0 | NA | NA | - | - |
| 97.5\% | 16.6\% | 16.6\% | 96.4\% | 103.2\% | 0 | 211,877 | NA | 177.0 | - | 52.7 |
| 99.0\% | 19.1\% | 19.1\% | 109.1\% | 116.9\% | 555,779 | 777,770 | 67.5 | 48.2 | 35.5 | 29.3 |
| 99.5\% | 20.8\% | 20.8\% | 119.7\% | 128.2\% | 1,029,656 | 1,272,977 | 36.4 | 29.5 | 24.5 | 21.2 |
| 99.9\% | 25.3\% | 25.3\% | 138.8\% | 148.6\% | 1,931,488 | 2,165,954 | 19.4 | 17.3 | 15.4 | 14.1 |
| Average | 7.3\% | 7.3\% | 45.3\% | 48.6\% | 14,605 | 21,383 | 2,567.6 | 1,753.7 | 72.9 | 71.9 |
| Percent of Trials Resulting in Zero Capital Contribution |  |  |  |  | 98\% | 97\% | 98\% | 97\% | 98\% | 97\% |

* Contributed capital in excess of the $\$ 500$ million of initial capital
** Calculated as Original Risk divided by contributed capital plus $\$ 500$ million

United Guaranty Corporation
Comparison of Empirical Cumulative Default Rates
Corelogic Servicing Database
All Loans
Data as of M arch 2012

*Average FICO score weighted by original loan balance
**Average Combined Loan-to-Value Ratio weighted by original Ioan balance

United Guaranty Corporation
Comparison of Empirical Cumulative Default Rates
Corelogic Servicing Database
GSE Loans
Data as of M arch 2012

|  |  | Non-PMI Loans |  |  |  | PMI Loans |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 90-Day or |  |  |  |  | 90-Day or |  |  |  |  |
|  |  | Worse |  |  |  |  | Worse |  |  |  | Default Rate |
|  |  | Default | Default | Average | Average |  | Default | Default | Average | Average | Relativity (PMI / |
| Origination Year | Loan Count | Count | Rate | FICO* | CLVT** | Loan Count | Count | Rate | FICO* | CLVT** | Non-PMI) |
| 1998 | 37,558 | 2,495 | 6.6\% | 696 | 92 | 9,040 | 774 | 8.6\% | 697 | 91 | 1.29 |
| 1999 | 94,212 | 8,525 | 9.0\% | 689 | 93 | 31,281 | 2,980 | 9.5\% | 695 | 92 | 1.05 |
| 2000 | 35,123 | 5,967 | 17.0\% | 685 | 94 | 23,640 | 2,591 | 11.0\% | 694 | 93 | 0.65 |
| 2001 | 138,638 | 11,309 | 8.2\% | 700 | 91 | 102,205 | 6,193 | 6.1\% | 703 | 91 | 0.74 |
| 2002 | 239,898 | 15,830 | 6.6\% | 706 | 91 | 182,254 | 10,705 | 5.9\% | 703 | 91 | 0.89 |
| 2003 | 393,044 | 23,091 | 5.9\% | 710 | 91 | 250,206 | 18,332 | 7.3\% | 705 | 91 | 1.25 |
| 2004 | 249,683 | 24,106 | 9.7\% | 712 | 93 | 195,616 | 21,012 | 10.7\% | 697 | 93 | 1.11 |
| 2005 | 244,809 | 46,546 | 19.0\% | 718 | 96 | 192,350 | 31,370 | 16.3\% | 699 | 93 | 0.86 |
| 2006 | 235,990 | 75,605 | 32.0\% | 716 | 98 | 217,416 | 48,001 | 22.1\% | 693 | 94 | 0.69 |
| 2007 | 324,737 | 101,428 | 31.2\% | 718 | 98 | 429,097 | 105,281 | 24.5\% | 694 | 95 | 0.79 |
| 2008 | 133,650 | 20,963 | 15.7\% | 735 | 95 | 274,795 | 31,998 | 11.6\% | 728 | 92 | 0.74 |
| 2009 | 192,379 | 7,852 | 4.1\% | 748 | 92 | 130,296 | 1,637 | 1.3\% | 756 | 90 | 0.31 |
| 2010 | 249,928 | 5,058 | 2.0\% | 748 | 93 | 88,155 | 695 | 0.8\% | 754 | 92 | 0.39 |
| Average Default R | Relativity |  |  |  |  |  |  |  |  |  | 0.83 |
| Total for all Years | 2,887,632 | 350,178 | 12.1\% | 725 | 94 | 2,263,123 | 281,808 | 12.5\% | 714 | 93 | 1.03 |

United Guaranty Corporation
Comparison of Empirical Cumulative Default Rates
Corelogic Servicing Database
Non-GSE Loans
Data as of M arch 2012

|  |  | Non-PMI Loans |  |  |  | PMI Loans |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 90-Day or |  |  |  |  | 90-Day or |  |  |  |  |
|  |  | Worse |  |  |  |  | Worse |  |  |  | Default Rate |
|  |  | Default | Default | Average | Average |  | Default | Default | Average | Average | Relativity (PMI/ |
| Origination Year | Loan Count | Count | Rate | FICO* | CLVT** | Loan Count | Count | Rate | FICO* | CLVT** | Non-PMI) |
| 1998 | 2,507 | 1,128 | 45.0\% | 640 | 97 | 506 | 69 | 13.6\% | 697 | 90 | 0.30 |
| 1999 | 7,944 | 3,991 | 50.2\% | 629 | 98 | 1,323 | 376 | 28.4\% | 679 | 92 | 0.57 |
| 2000 | 3,863 | 2,183 | 56.5\% | 624 | 99 | 1,065 | 336 | 31.5\% | 694 | 94 | 0.56 |
| 2001 | 11,376 | 4,711 | 41.4\% | 649 | 97 | 4,157 | 937 | 22.5\% | 698 | 92 | 0.54 |
| 2002 | 26,075 | 9,113 | 34.9\% | 667 | 96 | 6,017 | 1,704 | 28.3\% | 702 | 92 | 0.81 |
| 2003 | 62,714 | 18,316 | 29.2\% | 698 | 93 | 31,189 | 5,865 | 18.8\% | 709 | 91 | 0.64 |
| 2004 | 108,947 | 33,518 | 30.8\% | 707 | 94 | 32,527 | 8,839 | 27.2\% | 704 | 92 | 0.88 |
| 2005 | 236,341 | 100,196 | 42.4\% | 711 | 95 | 54,986 | 16,299 | 29.6\% | 702 | 91 | 0.70 |
| 2006 | 281,442 | 132,794 | 47.2\% | 707 | 95 | 76,304 | 23,191 | 30.4\% | 700 | 92 | 0.64 |
| 2007 | 248,502 | 108,558 | 43.7\% | 697 | 96 | 73,177 | 23,403 | 32.0\% | 701 | 93 | 0.73 |
| 2008 | 203,927 | 56,061 | 27.5\% | 668 | 97 | 27,213 | 5,147 | 18.9\% | 728 | 91 | 0.69 |
| 2009 | 151,483 | 19,888 | 13.1\% | 695 | 96 | 3,883 | 95 | 2.4\% | 758 | 89 | 0.19 |
| 2010 | 194,505 | 5,739 | 3.0\% | 719 | 96 | 23,657 | 357 | 1.5\% | 752 | 92 | 0.51 |
| Average Default Rate Relativity |  |  |  |  |  |  |  |  |  |  | 0.60 |
| Total for all Years | 1,552,733 | 496,365 | 32.0\% | 701 | 96 | 339,230 | 87,112 | 25.7\% | 710 | 92 | 0.80 |
| *Average FICO score weighted by original loan balance |  |  |  |  |  |  |  |  |  |  |  |
| **Average Combined Loan-to-Value Ratio weighted by original Ioan balance |  |  |  |  |  |  |  |  |  |  |  |





United Guaranty Corporation
Comparison of Empirical Cumulative Default Rates
Corelogic Servicing Database
Purchase Loans
Data as of M arch 2012


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Comparison of Empirical Cumulative Default Rates
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GSE Purchase Loans
Data as of M arch 2012


United Guaranty Corporation
Comparison of Empirical Cumulative Default Rates
Corelogic Servicing Database
Non-GSE Purchase Loans
Data as of M arch 2012

|  |  | Non-PMI Loans |  |  |  | PMI Loans |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 90-Day or |  |  |  |  | 90-Day or |  |  |  |  |
|  |  | Worse |  |  |  |  | Worse |  |  |  | Default Rate |
|  |  | Default | Default | Average | Average |  | Default | Default | Average | Average | Relativity (PMI / |
| Origination Year | Loan Count | Count | Rate | FICO* | CLVT** | Loan Count | Count | Rate | FICO* | CLVT** | Non-PMI) |
| 1998 | 2,053 | 927 | 45.2\% | 639 | 98 | 337 | 49 | 14.5\% | 698 | 92 | 0.32 |
| 1999 | 7,091 | 3,591 | 50.6\% | 628 | 98 | 1,060 | 300 | 28.3\% | 680 | 93 | 0.56 |
| 2000 | 3,700 | 2,084 | 56.3\% | 625 | 100 | 928 | 281 | 30.3\% | 696 | 94 | 0.54 |
| 2001 | 7,993 | 3,620 | 45.3\% | 640 | 98 | 2,563 | 586 | 22.9\% | 701 | 94 | 0.50 |
| 2002 | 18,906 | 7,062 | 37.4\% | 658 | 97 | 3,467 | 907 | 26.2\% | 705 | 94 | 0.70 |
| 2003 | 36,512 | 11,716 | 32.1\% | 699 | 95 | 17,722 | 3,395 | 19.2\% | 712 | 93 | 0.60 |
| 2004 | 84,580 | 25,333 | 30.0\% | 711 | 94 | 23,841 | 6,385 | 26.8\% | 708 | 93 | 0.89 |
| 2005 | 174,678 | 71,891 | 41.2\% | 716 | 95 | 36,555 | 11,314 | 31.0\% | 707 | 93 | 0.75 |
| 2006 | 199,855 | 87,294 | 43.7\% | 713 | 96 | 50,878 | 14,761 | 29.0\% | 704 | 94 | 0.66 |
| 2007 | 162,899 | 64,151 | 39.4\% | 704 | 97 | 49,722 | 15,118 | 30.4\% | 703 | 94 | 0.77 |
| 2008 | 126,435 | 31,862 | 25.2\% | 679 | 98 | 18,730 | 3,510 | 18.7\% | 730 | 92 | 0.74 |
| 2009 | 97,783 | 9,656 | 9.9\% | 695 | 97 | 1,255 | 36 | 2.9\% | 755 | 91 | 0.29 |
| 2010 | 102,223 | 3,334 | 3.3\% | 706 | 98 | 12,122 | 114 | 0.9\% | 758 | 91 | 0.29 |
| Average Default Rate Relativity |  |  |  |  |  |  |  |  |  |  | 0.59 |
| Total for all Years | 1,033,487 | 322,633 | 31.2\% | 705 | 96 | 221,227 | 57,056 | 25.8\% | 712 | 93 | 0.83 |
| *Average FICO score weighted by original loan balance |  |  |  |  |  |  |  |  |  |  |  |






[^0]:    ${ }^{1}$ Note: mortgage insurers are regulated by the Department of Insurance for each state and are not subject to capital requirements as proposed by Basel II.

[^1]:    ${ }^{2}$ The appendix to this report provides a comparison of the cumulative default rate for loans insured by mortgage insurers compared to similar loans not insured by mortgage insurers for recent origination years

[^2]:    3 This definition of default may result in a higher default rate compared to a mortgage insurance claim indicator, particularly in years with positive home price appreciation.

[^3]:    4 Prior to any experience consideration. A default rate for a given cohort of loans is defined as the sum of original loan balance on defaults for that particular cohort divided by the sum of total original loan balance.

[^4]:    5 The difference between the ultimate default rate percentiles for Qualified Mortgages on Table 1 and the simulated ultimate default rate percentiles on Exhibit 6 Page 1 is the percentiles on Table 1 are from the converged gamma fit while the percentiles from Exhibit 6 Page 1 are developed from 10,000 random simulations.

