Mortgage Insurance Companies of America

August 1, 2011

Office of the Comptroller of the Currency (OCC)
250 E Street, SW, Mail Stop 2-3
Washington, DC 20219
Docket No. OCC-2011-0002 / RIN 1557-AD40

Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549-1090
Elizabeth M. Murphy, Secretary
File No. S7-14-11 / RIN 3235-AK96

Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue, NW
Washington, DC 20551
Jennifer J. Johnson, Secretary
Docket No. R-1411 / RIN 7100-AD70

Federal Housing Finance Agency
1700 G Street, NW, Fourth Floor
Washington, DC 20552
Attn: Alfred M. Pollard, General Counsel
Attn: Comments / RIN 2590-AA43

Federal Deposit Insurance Corporation
550 17th Street, NW
Washington, DC 20429
Attn: Robert E. Feldman, Executive Secretary
Attention: Comments / RIN 3064-AD74

Department of Housing and Urban Development
Regulations Division
Office of General Counsel
451 7th Street, SW, Room 10276
Washington, DC 20410-0500
Docket FR 5504-P-01 / RIN 2501-AD53

Subject: **Credit Risk Retention**

Ladies and Gentlemen:

The Mortgage Insurance Companies of America (MICA) is pleased to comment on the notice of proposed rulemaking (NPR)[1] issued to implement Section 941 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank).[2] Our comments will focus on the exemption from risk retention for qualified residential mortgages (QRMs) and other issues related to the residential mortgage asset

[1] Interagency Proposed Rule, *Credit Risk Retention*, 76 Fed. Reg. 24090 (Apr. 29, 2011) *available at* http://edocket.access.gpo.gov/2011/pdf/2011-8364.pdf. The Board of Governors of the Federal Reserve System (FRB), Federal Deposit Insurance Corporation (FDIC), Office of the Comptroller of the Currency (OCC), Securities and Exchange Commission (SEC), Department of Housing and Urban Development (HUD) and Federal Housing Finance Agency (FHFA) are collectively referred to herein as "the agencies" in this response.

[2] Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (2010).

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category, especially those which relate to the essential role of private mortgage insurance (MI) in the US housing markets.[3]

MICA provides this response for two reasons. First, MICA represents the US MI industry and thus has a longstanding interest in encouraging maintenance of healthy primary and secondary markets for residential mortgage loans. Since 1957 the MI industry has been an integral part of the housing finance industry, helping more than 25 million families buy homes, many of them first-time buyers or families moving to take a better job or embrace new opportunities. Under the proposed QRM definition, millions of similarly situated homeowners will face unwarranted higher mortgage finance costs or lose access to credit altogether, and investors will not benefit from the reduced default frequency and loss severity provided by MI. MICA proposes solutions that increase investor confidence in housing finance, facilitate the restart of securitization markets and maximize consumer choice by encouraging the origination of prudently underwritten, sustainable mortgages.

Second, the NPR discourages use of MI. Throughout the ongoing housing downturn MICA's members have continued to pay valid claims, identify fraudulent behavior in the market and provide underwriting capacity and private capital support for new mortgage lending. MI also has reduced the cost to taxpayers resulting from the collapse of the government-sponsored enterprises (GSEs). Risk retention is intended to promote investment in well underwritten, stable residential mortgages and not to decrease consumer choice or increase investor risk. MICA explains how the use of MI increases consumer choice by providing a responsible alternative to Government mortgage insurance programs and decreases investor risk by providing an independent source of underwriting expertise and a well-regulated source of credit risk transfer.

Executive Summary

MICA makes the following recommendations, which are supported by analytic work and discussed in detail in this response.

- Expand QRM – The QRM definition in the NPR is too narrow. It increases the cost and decreases the availability of credit for a large portion of creditworthy borrowers. The data clearly demonstrate that QRM can be expanded to

[3] This comment letter addresses questions 79, 80, 81, 96-106, 108, 110, 111, 113, 120, 123, 143-145, 147 and 162. Each Section identifies the questions specifically addressed therein. The use of the term "MI" throughout is intended to mean "qualified MI", as explained by Section VI below.

include a greater number of prudently underwritten loans, furthering the interests of investors and consumers alike. MICA's proposed definition increases the pool of borrowers that will be able to access QRM loans, consistent with Dodd-Frank's legislative history and eminently defensible on public policy grounds. Specifically, MICA proposes revising the definition of QRM to include loans with a maximum (1) combined loan-to-value (CLTV) ratio of 97% for both purchase and rate and term refinance loans, and (2) a back-end debt-to-income (DTI) ratio of 45%. High LTV loans (those with a CLTV greater than 80%) should have MI as well, which reduces both the frequency of default and loss given default, or severity (*i.e.*, credit risk to investors). MICA estimates the proposed expansion of the QRM definition will increase the number of eligible QRM loans by more than 40% without increasing default risk materially.[4]

Requiring MI on high LTV loans assures borrowers a better chance of staying in their home because MI companies also have a strong interest in preventing defaults, encouraging defaulted loans to "cure" (or become non-delinquent) and reducing foreclosures – foreclosure and loss is the MI claim trigger. MI use also promotes "skin in the game," not only for the MI company (which has its own capital at risk in a first loss position), but also for the lender as a result of the MI companies holding the lender accountable for the integrity of their origination and servicing processes – thus protecting the investor. MICA's Proposed Expanded QRM definition, which includes greater borrower eligibility but expects default performance better than historical results for either the conventional private or Government-insured markets, achieves the Congressional intent underlying the QRM concept. Because FHA loans are exempt from risk retention, expanding QRM as MICA proposes is necessary to ensure a robust private insurance market for high LTV loans.

- Exempt all mortgages backed by MI from risk retention – MI-insured loans should be included in the QRM (as

[4]MICA's proposal increases eligibility from 17% to 25% (a 46% increase) for loans originated from 2001-2010, and from 30% to 43% (a 45% increase) for loans originated in 2009 and 2010 – two years in which underwriting standards were exceptionally tight - while only increasing the estimated default rate from 0.81% to 1.19% (vs. 5.13% for all conventional loans) for loans originated over a similar time period (2001-2008).

recommended above), but loans insured by MI should be exempt from any risk retention requirement as well to ensure parity of privately insured loans with loans insured by Government mortgage insurance/guarantee programs. Congress exempted loans insured by the FHA and other Government programs from risk retention in Dodd-Frank. A failure to exempt privately insured loans in the final risk retention regulation will create a permanent market advantage for Government mortgage insurance/guarantee programs over privately insured loans. Virtually all loans eligible for FHA insurance and not meeting the final QRM definition (*i.e.,* non-QRM loans) will be insured by FHA and sold through GNMA, another Government guarantee program, even though MI encourages better incentive alignment than its Government counterpart. Thus, without creation of an exemption for MI-insured loans, an intended 5% risk retention requirement for private securitizations likely will result in 100% risk retention by Government entities, at taxpayer risk and possible expense. Both Congress and the Administration have expressed interest in reducing the role of the Government in home finance. Creating an MI exemption will further these policy objectives.

- Include MI as a permissible form of risk retention for non-QRM Loans – Congress expressly provided for third parties to be treated as "risk retainers" in Dodd-Frank. Indeed, both the Treasury and Federal Reserve raised the possibility of third party credit enhancement providers as "risk retainers" in their reports on risk retention required by Dodd-Frank. A first loss provider like MI has sufficient skin in the game to satisfy the incentive alignment with originators, securitizers and investors envisioned by Congress in the construction of Section 941 and thus should be considered as a permissible form of risk retention. A detailed description of the current regulatory and capital structure of the private MI industry is provided to support this point.

- Maintain GSE exemption as proposed – MICA agrees that the NPR's proposed exemption of GSE securities from risk retention while these entities are operating under conservatorship provides much needed stability to the current mortgage market.

- Hedging restrictions should be clarified – The NPR's proposed restrictions on hedging or transferring retained

credit risk are generally appropriate. MICA believes the Agencies should clarify the intended purpose of the hedging/transfer restrictions as being the promotion of positive incentive effects. To that end, MICA proposes that the Agencies require a documented justification or preapproval for any hedge or transfer proposed, and that any hedging or transfer activity be subject to anti-abuse standards.

- Make all related agency analytics, research, and reports public – Given the importance of credit risk retention issue to the issue of restarting private securitization markets, MICA urges the agencies to make public all of the analytics, research and reports upon which conclusions related to the QRM and the treatment of MI are based in the spirit of Executive Orders 12866,[5] 13563[6] and 13579,[7] and the recent skepticism shown regarding cost/benefit analysis done by the agencies in other financial regulatory matters.[8]

I. Congressional Intent Regarding QRM and the Role of MI

This portion of the MICA response along with sections II and III below are directed to Question 111 of the NPR.

The legislative history behind the formulation of the QRM definition makes clear that loans with down payments of less than 20 percent were contemplated by Congress as qualifying for inclusion and MI was to be considered as the primary mechanism for mitigating default risk on low down payment loans included in the QRM.

The QRM definition in the NPR is inconsistent with the legislative history of Dodd-Frank in two ways:

- First, the legislative history shows that Congress "was seeking a broad exemption that would include almost all well underwritten mortgage loans that complied with pre-boom

[5] Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).
[6] Exec. Order No. 13,563, 76 Fed. Reg. 3,821 (Jan. 21, 2011).
[7] Exec. Order No. 13,579, 76 Fed. Reg. 41,587 (July 14, 2011).
[8] See, e.g., Business Roundtable et al v Securities and Exchange Commission, No. 10-1305 (DC Cir., July 22, 2011), available at http://www.cadc.uscourts.gov/internet/opinions.nsf/89BE4D084BA5EBDA852578D5004FBBBE/$file/10-1305-1320103.pdf.

standards."[9] Indeed, when efforts were made to include a minimum five percent down payment requirement for loans in lieu of a risk retention requirement, these efforts were defeated "in large part because of concern that a 5 percent down payment requirement was viewed as too restrictive."[10] The expressed concern at the time was that these and other requirements would have negative consequences "for first-time homebuyers, minority home buyers, and others" seeking to become homeowners. Congress believed that properly underwritten low down payment loans performed well, and borrowers should not be discouraged by the establishment of a minimum down payment requirement.[11]

- Second, the QRM amendment approved by the Senate made clear that the purpose of the amendment was to encourage the return to well underwritten mortgages, where there "is equity of 20 percent in every loan, either through a down payment **or if the down payment is less than 20 percent, having mortgage insurance**."[12] The legislative history is clear that Congress rejected a hard-wired minimum down payment requirement and expected MI to be used for loans with less than 20 percent down payment.

Thus, the QRM definition should be revised to be consistent with Congressional intent regarding risk retention in the residential mortgage asset category.

II. QRM Can be Expanded to be More Inclusive and Still Perform Well Within Appropriate Levels of Performance

This portion of the MICA response is directed to Questions 106, 108, 110, 111, 113, 120, 123, 143-145, 147, 162 of the NPR.

A. Proposed Revision to QRM

Historical loan performance data demonstrate that QRMs can be defined far more inclusively than the agencies are proposing while still performing at acceptable default levels. MICA thus urges the agencies to revise the definition of QRM to include loans with CLTVs of up to

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[9] Ray Natter, *What Was the Legislative Intent behind the QRM?* Barnett Sivon & Natter, Our Perspectives, June 2011, p. 2. See Appendix 1.
[10] Ibid.
[11] Statement of Senator Dodd against the amendment of Senator Corker 156 Congressional Record S3518 and S3520 (May 11, 2010) as referenced in Natter, p.2,
[12] Natter, Op. Cit., p. 5. (Emphasis supplied).

97% (provided that loans with CLTVs above 80% have MI (or other comparable insurance or credit enhancement)) and back-end DTIs of up to 45% (the " Proposed Expanded QRM").[13] The Proposed Expanded QRM would increase the number of borrowers who would have access to a QRM, including a greater percentage of low to moderate income, minority and first-time home buyers, but still result in loans that would perform well under even the most conservative performance benchmark.[14] In other words, the Proposed Expanded QRM is consistent with the legislative history of Dodd-Frank regarding the QRM provision. The NPR QRM and alternative QRM definitions are not.

B. QRM Performance

The narrow approach taken by the agencies is not warranted based on loan performance. An analysis of over 43 million first lien residential mortgage loans originated from 2001 – 2008 contained in the CoreLogic Servicing Database demonstrates that loans with LTVs up to 97% and DTIs up to 45% perform well even under severe economic stress and should be included in the definition of QRM.[15] MICA analyzed the performance of loans that would have satisfied the agency QRM definition, the agency alternative QRM definition and MICA's Proposed Expanded QRM definition.[16] The loan terms of each definition are set forth in the table below:

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[13] The Agencies' Proposal includes a front-end DTI (the ratio of monthly mortgage payments to monthly gross income) and a back-end DTI (the ratio of total monthly scheduled debt to monthly gross income). MICA recommends that the QRM not include a front-end DTI requirement. Should the Agencies determine that a front-end DTI is appropriate, however, MICA recommends that it be set at a level that that corresponds to a 45% back-end DTI. As a general rule, front-end DTIs are typically six percentage points less than comparable back-end DTIs.

[14] Based on analysis of over 43 million loans originated from 2001 - 2008 with an aggregate principal amount of approximately $8.8 trillion included in the CoreLogic Servicing Database.

[15] The analysis assumes that any definition of QRM adopted by the agencies will include only fully documented, fully amortizing loans and, in the case of loans with LTVs greater than 80%, MI.

[16] The CoreLogic Servicing Database does not include front end ratios, so the analysis was run with only back end ratios. The impact of a 3% cap on points and fees was estimated based on aggregate, state-by-state data provided by a national mortgage lender because the CoreLogic Servicing Database does not include detail on points and fees. The CoreLogic Servicing Database does not include derogatory factors, so for analytical purposes, a 690 FICO score was used as a proxy for the proposed derogatory factors.

Terms and Features			
	Agency QRM	**Agency Alternative QRM**	**Proposed Expanded QRM**
Front DTI	28	28 Arm/33 Fixed	**N/A**
Back DTI	36	38 Arm/41 Fixed	**45**
Purchase CLTV/piggyback	80%/No	90%/Yes	**97%/No**
Refinance CLTV/piggyback	75%/Yes	90%/Yes	**97%/No**
Cash CLTV/piggyback	70%/Yes	75%/Yes	85%/No
Negative Amortization	No	No	No
Points and Fees	3% Cap	3% Cap	3% Cap
Interest Only	No	No	No
Balloons	No	No	No
Prepay Penalty	No	No	No
ARM Margins	2/2/6	2/2/6	2/2/6
ARM Product	All	All	All
Credit	690*	690*	690*
Max Term	30yr	30yr	30yr
Occupancy	Primary	Primary	Primary
Documentation	Full	Full	Full
MI Requirement >80 LTV	n/a	MI or Piggy back	**Yes**

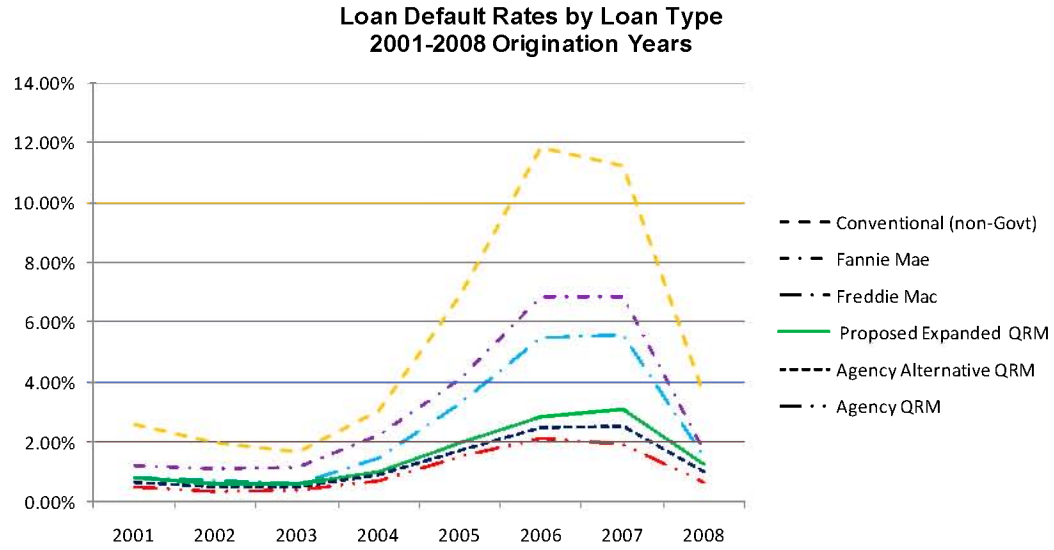
*690 FICO score is used as a proxy for the credit history factors included in the Agencies' Proposal.

The graph below compares cumulative default rates for loans that would satisfy the definitions of agency QRM, agency alternative QRM, the GSEs, all conventional loans (*i.e.*, loans not guaranteed by a Government program), and the Proposed Expanded QRM.[17] The data clearly show that the QRM definition can be broadened significantly while still performing within acceptable ranges. The default rate for the agency QRMs is 0.81%, 1.02% for the agency alternative, and 1.19% for the MICA Proposed Expanded QRM.[18] All three options perform materially better than conventional loans and loans purchased by Fannie Mae and Freddie Mac, which experienced average default rates of 5.13%, 2.83% and 2.23% respectively. MICA's *Proposed Expanded QRM, with its broader reach than the agency QRM.or*

[17] Source: for conventional loans, CoreLogic Servicing Database 2001 – 2008 originations; for Fannie Mae and Freddie Mac loans, first quarter 2011 earnings releases available at http://www.fanniemae.com/ir/pdf/sec/2011/q1credit_summary.pdf and http://www.freddiemac.com/investors/er/pdf/supplement_1q11.pdf, respectively. Conventional loans are all loans other than those insured or guaranteed by a Federal agency.

[18] Default rate is the percentage of loans originated that upon termination were in foreclosure or "REO" (real estate owned) status or were 90 days or more delinquent.

alternative QRM definitions, still performs 54% better than GSE loans and 77% better than conventional loans.



Detailed data reflected in the graph are set forth in the table below:

Loan Default Rates by Loan Type
2001 – 2008 Origination Years

	Conventional	Fannie Mae	Freddie Mac	Proposed Expanded QRM	Agency Alternative QRM	Agency QRM
2001	2.56%	**1.20%**	**0.80%**	0.81%	0.66%	0.48%
2002	1.98%	**1.10%**	**0.70%**	0.57%	0.48%	0.36%
2003	1.67%	**1.15%**	**0.60%**	0.58%	0.50%	0.39%
2004	3.05%	**2.20%**	**1.47%**	1.01%	0.88%	0.72%
2005	6.91%	**4.11%**	**3.30%**	1.96%	1.73%	1.49%
2006	11.86%	**6.85%**	**5.50%**	2.80%	2.47%	2.11%
2007	11.22%	**6.85%**	**5.60%**	3.07%	2.52%	1.94%
2008	3.62%	**1.70%**	**1.50%**	1.28%	1.00%	0.64%
2001-2008	**5.13%**	**2.83%**	**2.23%**	**1.19%**	**1.02%**	**0.81%**

C. QRM Market Reach

The NPR's QRM definitions will exclude a significant portion of potential home buyers from access to prudent and sustainable mortgages. MICA's Proposed Expanded QRM will perform well *and*

significantly expands the availability of QRMs.[19]

- On average, only 17% of loans originated from 2001 – 2010 would have satisfied the agency QRM definition, and only 23% of those originations would have satisfied the alternative QRM definition.
- Looking only at 2009 and 2010, two years in which credit standards were considered to be extremely conservative, the agency QRM would have accounted for only 30% of originations.
- In contrast, 43% of originations would have qualified under MICA's Proposed Expanded QRM, looking at only 2009 and 2010.

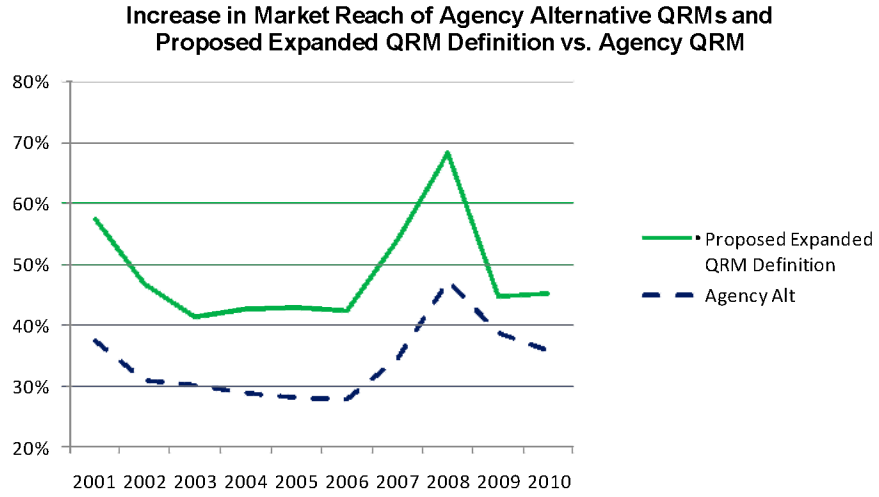
While the recent financial crisis demonstrated that overly lenient underwriting standards result in some borrowers obtaining mortgages that are not sustainable, overly stringent standards are now preventing creditworthy borrowers access to mortgages and impeding the resolution of the housing crisis. Because the NPR QRM definitions are even more conservative, they will institutionalize overly restrictive standards, increasing the cost of credit and reducing access to the housing market for the bulk of first-time home buyers and all but the comparatively wealthy and cash rich. This is inconsistent with the policy intended by Congress under Dodd-Frank. Congress recognized the need for flexibility in underwriting and explicitly recognized that risk cannot be avoided in its entirety, but instead must be identified and managed prudently.[20]

To assess market impact of the various alternatives under consideration, MICA calculated the percent of 2001 – 2010 conventional mortgage market originations (as reflected in the CoreLogic Servicing Database) that would have satisfied the agency

[19] Market shares calculated based on data on over 49 million loans originated from 2001 – 2010 included in the CoreLogic Servicing Database.

[20] The need for flexible underwriting standards and the importance of ensuring that underserved borrowers have access to prudent, affordable mortgages was highlighted during Senate debate on a proposed amendment to the Act that would have mandated a 5% down payment. Voicing his opposition to the proposal, Senate Banking Committee Chairman Chris Dodd stated "the [5% down payment requirement] puts in government-dictated, hard-wired underwriting standards that would have very serious consequences … for first-time home buyers, minority home buyers and others who are seeking to attain the American dream of home ownership … [I]t does this at a time … that the housing markets are just starting to recover, potentially putting that recovery at risk." 156 *Cong. Rec.* S3518 (May 11, 2010).

alternative QRM definition and the Proposed Expanded QRM definition. As seen in the graph below, while the agency alternative QRM definition would reach a greater portion of the market (approximately 34% more) than the agency QRM definition, the Proposed Expanded QRM definition reaches an approximately 46% greater share of the market than even the agency alternative.



The market impact of the agency QRM and the agency alternative QRM definitions are even more undesirable when one evaluates *which* borrowers will be excluded from these definitions. The NPR QRM proposals will adversely impact traditionally underserved markets and first-time home buyers. In 2010, approximately 86% of first-time home buyers would have been excluded by the 20% down payment requirement, and approximately 70% would have been excluded even if the down payment requirement was reduced to 10%. Median down payments in 2010 were 8%, with first-time home buyers averaging a 4% down payment.[21] Wide availability of low down payment loans is essential for first-time homebuyers. For example, it takes a family earning $50,000 a year more than eleven years to save a 20% down payment on a $153,000 home (the median priced existing house sold in the US in 2010).

Wide availability of low down payment loans also is necessary for the housing market recovery. As a result of the current housing downturn, many families who bought during the market boom have lost equity in their existing homes. Refinancing to a lower interest rate or shorter term loan becomes more difficult under the proposed QRM definitions in the NPR. People who bought homes in the past few years but now

[21] National Association of Realtors, *Profile of Home Buyers and Sellers 2010,* p. 71.

need to move for a new job or need a larger home for their family are at a disadvantage with a 20% minimum down payment requirement because they were not able to build equity as homeowners did in past years and may well have lost some or all of the equity they invested in their current home. These low down payment, repeat buyers and first-time homebuyers who need low-down payment options are a large part of today's housing market and are critical to the housing recovery. The National Association of Realtors estimates that 75% of all buyers – first-time buyers and repeat buyers – financed eighty percent or more of their home purchase in 2010.[22]

Without the continued availability of adequate, prudent private capital options for low-down payment lending, both first-time borrowers and repeat homebuyers will face limited financing options. As a result, many of these potential home purchasers will delay or end their attempt to buy a house and, as a consequence, the housing market recovery – already fragile – will falter or even fail.

D. A Narrow QRM will Raise Costs and Limit Borrower Choice

The narrow approach for QRM taken by the agencies will force virtually all low down payment lending toward other exemptions or exceptions – either to the FHA or (for the foreseeable future) to the GSEs. Borrower costs will be increased and borrower choice will be limited; private capital will be driven out of housing or discouraged from entering; and the role of the government – and the ultimate financial risk to taxpayers – will be maintained at its current elevated level of over 95% of all home loans.

Under the NPR the only way for a low down payment borrower to secure a loan, *regardless of that borrower's credit history or capacity to repay his or her loan*, will be via FHA, the GSEs (but only for so long as their guarantees are a permissible form of risk retention) or through a higher cost non-QRM that is subject to risk retention.[23] That is a poor outcome for borrowers, for housing markets and for taxpayers.

In many cases today, the cost to a borrower of an FHA loan exceeds the cost of a loan with MI. For example, a borrower purchasing a $250,000 home with a 10% down payment would pay thousands of dollars more (over the typical life of a mortgage loan) for a loan with

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[22] National Association of Realtors, *Profile of Homebuyers and Sellers, 2010*, p.71 Exhibit 5-3.

[23] Moody's Analytics estimates that the interest rate for non-QRM loans will rise by 75 – 100 basis points. See Mark Zandi and Cristian deRitis, *Reworking Risk Retention*, Moody's Analytics, June 20, 2011.

FHA insurance than for a comparable loan with MI.[24] But if low down payment loans are excluded from the definition of QRM, there will no longer be a lower cost MI option for that borrower (once the treatment of the GSE guarantee as risk retention expires). Loans with MI will be saddled with additional risk retention costs that could drive virtually all low down payment lending to the FHA– even loans to high quality, low risk borrowers. This housing policy approach runs the risk of driving MI companies, along with the private capital they invest in housing finance, from the market (or, at a minimum, discouraging the entry of new capital).[25] Such a development will leave borrowers with less choice and higher costs, and burden taxpayers with more housing market risk. This outcome belies the Administration's stated goals of decreasing the role of the Government in housing finance and returning to a market that is primarily capitalized by private sector investment. In their joint paper on reforming US housing finance released in February 2011, The Department of the Treasury and the US Department of Housing and Urban Development laid out a plan under which private markets "will be the primary source of mortgage credit and bear the burden for losses."[26] Lenders simply do not offer low down payment loans without additional security such as MI or FHA

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[24] Assumes property purchase price of $250,000, base note rate of 5% (5.375% if the loan is sold to a GSE and subject to their current loan-level pricing) and borrower FICO score of 680, resulting in monthly payment of $1947 for a loan with FHA insurance versus a monthly payment of $1897 for a loan with private mortgage insurance sold to a GSE. Also assumes borrower remains in the home for at least four years.

[25] Section 951(c) of Dodd-Frank required the Board of Governors of the Federal Reserve System to conduct a study of the combined impact on each class of asset-backed security of the new credit risk retention requirements, including their effect on increasing the market for federally-subsidized loans. The study is available at http://www.federalreserve.gov/boarddocs/rptcongress/securitization/riskretention.pdf. MICA believes that the study did not address the critical question of whether failure to recognize MI as a criterion for the QRM and as qualified risk retention for non-QRM loans in concert with the proposed exemption for FHA will block the return of private capital to mortgage markets that would otherwise occur if a more sensible definition of risk retention and the QRM were provided.

[26] See US Dept. of the Treasury and US Dept. of Housing and Urban Development, *Reforming America's Housing Finance Market: A Report to Congress*, February, 2011. Available at http://www.treasury.gov/initiatives/Documents/Reforming%20America's%20Housing%20Finance%20Market.pdf The agencies are of course familiar with the huge cost to taxpayers related to Fannie Mae and Freddie Mac. FHA already is exposing taxpayers to potentially significant liability. The fiscal year 2012 Administration budget projects that the FHA's insurance-in-force will increase 28% in the current fiscal year (FY2011) and 10% in the next fiscal year. Taxpayer exposure for FHA mortgages will be $1.253 trillion by September 30, 2012. Not treating privately-insured loans similarly to FHA-insured loans in the QRM could significantly increase that potential exposure. Policies that result in driving more borrowers to FHA and other Government insurance programs will significantly increase the US taxpayers' exposure instead of putting private capital at risk.

backing. There is no other alternative to MI (*i.e.,* one that is large enough and with the appropriate infrastructure to meet the demand for credit enhancement on loans currently being insured by FHA) for management of the credit risk associated with low down payment lending. If US housing policy wishes to emphasize private capital, the QRM definition must be considered in light of the FHA exemption.

The data clearly demonstrate that a QRM can be more broadly defined to promote the origination of high quality, prudent and sustainable mortgages to a diverse range of credit worthy borrowers without materially compromising the overall performance of QRMs. Requiring MI on high LTV loans assures borrowers a better chance of staying in their home because the MIs' interests are aligned with theirs. It creates "skin in the game," not only for the MI company (which has its own capital at risk in a first loss position), but also for the lender as a result of the MI companies holding the lender accountable for the integrity of their origination and servicing processes – thus protecting the investor. MICA's Proposed Expanded QRM definition, which includes greater borrower eligibility but expects default performance better than historical results for either the conventional private or Government-insured markets, achieves Congressional intent underlying the QRM concept.

MICA suggests that its proposed broader QRM be accompanied by specific eligibility requirements for MI companies (described in Section VI below) and counterparty financial integrity requirements established and monitored by state insurance regulators, the only group of financial regulators in the US with regulatory and supervisory experience regarding MI. See Appendix 2 for a discussion of MI regulation.

E. Junior Liens Should be Prohibited in QRM Loans

MICA agrees with the proposed ruling's prohibition against the use of junior liens in conjunction with a QRM loan.[27] In addition to the performance issues outlined in the NPR, junior liens have proven to be a major obstacle to loan modifications and other efforts at loss mitigation due to conflicts of interest and lack of alignment with the

[27] See NPR page 24120. ("Thus, the proposed rules prohibit the use of a junior lien in conjunction with a QRM to purchase a home. Data indicate that, controlling for other factors, including combined LTV ratio, the use of junior liens at origination to decrease down payments—so-called "piggyback" mortgages—significantly increased the risk of default.[132]").

borrower. It would be poor policy to encourage widespread use of junior liens by including them within the final QRM definition.

III. Private Mortgage Insurance Should be an Eligibility Criterion for QRMs Because it Reduces the Frequency and Severity of Loss

This portion of the MICA response is directed to Questions 111a, 111b, and 111c of the NPR.

A. The NPR Applies an Inappropriate and Incomplete Measure of MI's Value

The legislative history of Dodd-Frank discussed above assumed the use of MI for low down payment loans included within the QRM definition. The agencies have taken a different approach regarding MI, which MICA believes is both inappropriate and incomplete. The agencies have argued that MI should be recognized only to the extent that it reduces the frequency of default. The agencies state that they "…. have not identified [adequate data] demonstrating that mortgages with credit enhancements such as (MI) are less likely to default than other mortgages…. Therefore, the Agencies are not proposing to include any criteria regarding …. (MI)."[28]

MICA believes the agencies' emphasis on reducing default frequency is misplaced. A formal default without loss (*e.g.* a late-paying borrower) is largely inconsequential to an investor even if the event happens multiple times. A default with loss does affect an investor because the loss needs to be allocated and absorbed, which is the primary role of MI. Indeed, the measure of effectiveness for any form of insurance is its ability to protect against or reduce the insured party's risk, and particularly its risk of loss. Thus, the standard applied by the agencies to measure MI's effectiveness is inappropriate. MI does reduce the frequency of default regarding low down payment loans (as shown below), but it is more appropriate to evaluate the value of MI based on its use in reducing the severity of losses to mortgage lenders and investors from defaults on their insured loans.

MICA's interpretation regarding the appropriate Dodd-Frank measure of MI's value is not controversial or self serving. It is in fact consistent with that of one of the agencies. The FDIC's legal justification for including loss mitigation provisions within the QRM definition rests in considerable part on its characterization of MI as a "…form of credit

[28] NPR at 24119.

support (that) …reduces the risk of default or the loss given default of the loan."[29] Thus, although MICA demonstrates below that MI reduces the frequency of default compared to uninsured low down payment loans, MICA suggests that legislative history and a functional approach to MI (as taken by the FDIC) requires full recognition of the value offered by MI in a revised QRM definition.

B. MI Satisfies the NPR Standard for Reducing Risk of Default

MICA discussed above its reasoning for interpreting the Dodd-Frank reference to MI reducing "the risk of default"[30] to mean the credit risk experienced by investors (*i.e.*, default + loss). In contrast, the agencies in the NPR restricted the measure of MI effectiveness to the simple incidence of default, explaining:

> While this insurance protects creditors from losses when borrowers default, the Agencies have not identified studies or historical loan performance data adequately demonstrating that mortgages with such credit enhancements are less likely to default than other mortgages, after adequately controlling for loan underwriting or other factors known to influence credit performance, especially considering the important role of LTV ratios in predicting default.[31]

Although MICA has requested that the agencies disclose the "variety of information and reports relative to such guarantees and credit enhancements"[32] used in developing its assessment of MI (and reaffirms this request here), we are not surprised that the Agencies are unable to identify specific studies because historically research on MI has not attempted to isolate the value of MI in reducing the frequency of default separately from its proven value in reducing losses. This is in no small part due the fact that low down payment loans (*i.e.*, >80% LTV) generally have mortgage insurance (whether MI, FHA or from another Government insurance/guarantee program) because of investor credit enhancement preferences or bank regulatory capital management, and not just for the credit underwriting value of mortgage insurance.[33]

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[29] See FDIC Office of General Counsel, "Legal Arguments Supporting Inclusion of Servicing Standards in Risk Retention" (Dec. 13, 2010) at 2, available at http://www.scribd.com/doc/45822085/FDIC-Legal-Arguments-for-Residential-Servicing-Standards.

[30] 15G(e)(4)(B)(iv).

[31] NPR at 24119.

[32] Id.

[33] The GSEs are required to obtain credit enhancement for loans with LTVs greater than 80%, and MI is the most commonly used of the three forms of credit enhancement (the others being lender recourse and participation agreements). See

The data needed to test the NPR measure of MI value comes primarily from the bubble era "piggyback" loan structure, in which a combination of a first mortgage, second mortgage and borrower down payment was used to avoid GSE credit enhancement requirements (a so-called "80/10/10" has an 80% LTV first mortgage, 10% second mortgage and 10% borrower down payment).[34] "Piggybacks" were used in sufficient number to create a pool of uninsured loans whose performance history can be compared against loans with MI.

Genworth Mortgage Insurance, a member of MICA, analyzed loan level data contained in the CoreLogic servicing data base to compare the performance of insured versus uninsured loans.[35] Genworth performed a tabular probability analysis of 4.9 million loans originated from 2003 - 2007, the results of which are included as Appendix 3. Controlling for origination year, geography, level of documentation, loan purpose, FICO score and CLTV, insured loans became seriously delinquent 32% less often than loans with piggyback seconds. Of loans that did become seriously delinquent, insured loans cured 54% more often than loans with piggyback seconds. As a result, borrowers with insured loans stayed in their homes 40% more often than those with piggyback seconds. The Genworth study was shared with the agencies prior to the publication of the NPR.

Based on the equivocal response to the Genworth study by the agencies, MI companies sponsored two independent studies which validated the conclusion that insured loans have substantially lower default incidence than uninsured loans after controlling for all other risk factors.

Independent Study 1: Promontory Financial Group

Genworth commissioned the Promontory Financial Group to conduct an independent analysis of low down payment loans in the CoreLogic data base, comparing the relative performance of insured and piggyback loans.[36] Promontory modeled defaults using a proven hazard

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e.g., Section 302(a)(2)(B)(3)(b)(2) of Fannie Mae Charter Act, available at http://www.fhfa.gov/GetFile.aspx?FileID=29. Federal bank capital regulation lowers the applicable risk weight for a high LTV residential mortgage loan carrying MI. See e.g., Interagency Guidelines for Real Estate Lending Policies, 12 C.F.R. 365, Appendix A at 623 (supervisory loan-to-value limits), available at http://edocket.access.gpo.gov/cfr_2010/janqtr/pdf/12cfr365AppA.pdf.

[34] NPR at 24120.

[35] The CoreLogic (NYSE: CLGX) servicing database encompasses more than 80% of the first-lien mortgages in the US. Further information regarding CoreLogic is available at www.corelogic.com.

[36] The Promontory study is attached as Appendix 4. Genworth has a more extensive summary of the Promontory study in its response to the NPR.

modeling framework, including important borrower and loan characteristics (*i.e.*, FICO score, CLTV, owner-occupied status, loan purpose and documentation) and economic factors (*i.e.*, home prices and interest/unemployment rates). The study found insured loans had a lower likelihood of default than uninsured loans, and the difference was statistically significant. For example, the following table shows default rates for a range of time periods since origination.

Estimated Baseline Cumulative Default Rates – Cumulative Proportion Defaulting by Selected Months

Type	Months					
	12	24	36	48	60	72
Insured	0.017	0.057	0.097	0.127	0.149	0.167
Non-Insured w/Piggyback	0.017	0.058	0.110	0.149	0.180	0.202
% Difference (Non-Insured Relative to Insured Loans)	***0%***	***2.09%***	***13.47%***	***17.40%***	***20.79%***	***20.98%***

The cumulative default rate for uninsured loans with piggyback seconds at 60 months (the time period used in the Milliman study below) and 72 months each was more than 20% greater than for comparable insured loans.

Independent Study 2: Milliman

MICA commissioned Milliman, a leading insurance and actuarial consulting firm, to do a comparative analysis of insured and uninsured loans using the same CoreLogic data set, a complete summary and the results of which are included as Appendix 5. Milliman performed a series of logistic regressions controlling for multiple factors, including:

- home price appreciation
- LTV
- presence of insurance
- FICO score
- property type
- loan purpose
- loan type
- originator type
- loan term
- relative property value

The results, displayed and discussed as a series of scenarios contained in the report, also confirm the beneficial effect of MI in reducing the likelihood of default. For summary purposes, however, the following table shows the relative differences of default rates and odds of default after 5 years for all uninsured loans compared to all insured loans by

CLTV and home price appreciation (HPA). Uninsured loans have from 31% to 94% greater likelihood of default than insured loans, with all differences exhibiting high statistical significance.

Default Rates: All Loans – Origination Years 2002 - 2006[37]

	CLTV 90	CLTV 95
HPA Range	**Insured Default Rate**	
HPA ≤ -20%	30.4%	33.5%
-20% < HPA ≤ 0%	10.9%	10.9%
0% < HPA ≤ 20%	5.8%	6.1%
20% < HPA	2.7%	3.4%
HPA Range	**Uninsured Default Rate**	
HPA ≤ -20%	53.8%	59.5%
-20% < HPA ≤ 0%	19.7%	18.4%
0% < HPA ≤ 20%	8.6%	8.0%
20% < HPA	3.8%	3.9%
HPA Range	**Difference of Uninsured to Insured Default Rate**	
HPA ≤ -20%	23.4%	26.0%
-20% < HPA ≤ 0%	8.8%	7.5%
0% < HPA ≤ 20%	2.8%	1.9%
20% < HPA	1.1%	0.5%
HPA Range	**Ratio of Uninsured to Insured Default Rate**	
HPA ≤ -20%	1.77	1.77
-20% < HPA ≤ 0%	1.80	1.69
0% < HPA ≤ 20%	1.48	1.33
20% < HPA	1.41	1.13
HPA Range	**Modeled Odds Relativity**	
HPA ≤ -20%	1.94	1.81
-20% < HPA ≤ 0%	1.53	1.37
0% < HPA ≤ 20%	1.45	1.40
20% < HPA	1.60	1.31

Two other results deserve mention:

- First, because much MI company business is related to GSE credit enhancement requirements and dependent on GSE purchase decisions, Milliman examined whether insured performance is better than uninsured performance on loans purchased by non-GSE investors. The Milliman results show a strong role for MI in reducing default incidence. Within this subset of loans the strong performance of MI-insured loans was clear across all house price appreciation scenarios but strongest when house prices fell. Additionally, the more significant the house price depreciation the greater the significance of MI

[37] Based on Table 3 of the Milliman study. Results shown are for "Terminated Loans Only" where, as described on page 15, "the ultimate performance of each loan is known as of the evaluation period of 20 quarters, which possibly imparts more stability in discerning statistical differences than the all loans model at any given evaluation period by reducing sample size and variation."

insurance and, MICA would argue, the greater the significance of the independent MI underwriting effect.[38]

- Second, because Congress intended MI to complement other parts of the QRM definition, Milliman examined whether insured performance is better than uninsured performance when a "QRM filter" was applied to privately purchased loans. The resulting analysis showed the strong impact of MI on privately purchased loans that otherwise met QRM requirements under every scenario except where house prices *increased* by more than 20% during the evaluation period. However, the impact of MI in this subset when house prices fell is significantly favorable for MI (*i.e.,* when the value of MI in avoiding default and reducing loss is magnified). Where house prices fell during the 5-year period the MI-insured privately purchased QRM qualifying loans performed two to almost four times as well as comparable uninsured loans. Even when house prices appreciated by less than 20% during the period the MI-insured loans performed almost twice as well as the uninsured loans.[39]

In conclusion, the report states[40]:

> **Milliman's results generally indicate loans with mortgage insurance at origination have historically been associated with a lower rate of default when compared to similar loans without mortgage insurance, after controlling for influential underwriting characteristics and economic trends.** This result is consistent across the five loan populations reviewed for this study. Loans with mortgage insurance showed the largest and most significant differences from uninsured loans in the negative HPA ranges. When applying the proposed QRM filters with the exception of LTV and DTI requirements, the results support the position that, if private mortgage insurance companies are not subject to pre-defined underwriting systems, loans with private mortgage insurance default at a lower rate than comparable loans without mortgage insurance.

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[38] Milliman Study at page 13. The results are consistent with the less significant effect shown for MI in connection with GSE loans, where the strong influence of GSE automated underwriting systems (AUS) acts to blunt efforts by MI companies to provide independent underwriting regarding low down payment loans. MGIC discusses the influence of GSE AUS on MI underwriting in its response to the NPR.

[39] Id at page 14.

[40] Id at page 15(Emphasis added).

MICA invited Professor William Poole to do a peer review the Milliman Study.[41] Professor Poole noted the difference in default ratios between insured and uninsured loans. Beyond the general favorable performance of insured loans, Professor Poole drew attention to the superior performance of insured loans in environments characterized by declining house prices, reasoning that policymakers and portfolio managers should find value in an MI company's ability to identify loans less likely to default under stressful circumstances.

Collectively, these studies provide powerful evidence regarding the ability of MI to reduce default incidence. Moreover, the studies do this using the same database and three different but well accepted methodologies. In each study, insured loans have substantially lower default incidence than uninsured loans after controlling for all other risk factors. The magnitude of the effect is similar across all three studies as well. The studies clearly show that MI underwriting meets the Dodd-Frank test of reducing the "risk of default" as defined in the NPR. Thus, MICA respectfully requests that the agencies revise their initial assessment of MI included in the NPR and confirm MI as an element of the QRM definition in the final risk retention rule.

C. MI Also Reduces the Risk of Default by Helping to Prevent or "Cure" Foreclosures

MI reduces defaults and helps homeowners stay in their homes through loan modification and other efforts taken by the MI companies to prevent avoidable foreclosures. Mortgage insurers have a history of partnering with lenders, investors and community groups to work with borrowers in default. From 2008 through year-end 2010, mortgage insurers have facilitated efforts to help 645,000 borrowers with a total principal balance of $130 billion stay in their home, lower their interest payment or avoid foreclosure by participating in modifications, workouts and HARP refinances. These "cure" rates demonstrate yet another way in which MI "reduces the risk of default."

IV. MI-insured Loans Should be Exempt from Risk Retention

This portion of the MICA response is directed to Questions 162 and 173(a) of the NPR.

MICA discussed above the importance of recognizing the potential created by an unqualified exemption for FHA and other Government

[41] Professor Poole's full review is included as Appendix 6 to this comment.

insurance/guarantee programs to undermine the objectives of Section 941 regarding risk retention and to drive low down payment lending to the FHA. The Dodd-Frank Act permits the agencies to jointly adopt or issue exemptions, exceptions, or adjustments to the rules issued under Section 941. The agencies' authority is conditioned by the need to show that any exemption, exception, or adjustment given (1) helps ensure high quality underwriting standards for the securitizers and originators whose assets are securitized or available for securitization; and (2) encourages appropriate risk management practices by the securitizers and originators of assets, improves the access of consumers and businesses to credit on reasonable terms, or otherwise is in the public interest and for the protection of investors.[42]

Absent a broader QRM, MICA proposes creating an exempt category for loans (and by implication, securitizations) that use MI in order to preserve a meaningful outlet for non-government low down payment lending.[43] MICA urges this action for several reasons. MI, with its independent underwriting criteria, meets the statutory test of helping to ensure high quality underwriting standards and encourages appropriate risk management practices by securitizers and originators of assets by reducing the risk of default. MI companies also provide a unique level of process oversight – sometime described as a "second pair of eyes" – that can serve as an important check on third party errors, omissions and outright fraud and misrepresentation.[44]

MI also improves consumers' access to credit on reasonable terms and is otherwise in the public interest. Indeed, one of the strongest policy arguments for supporting a "level playing field" between MI and Government mortgage insurance (such as FHA and VA programs) rests on consumer choice. Having access to a full set of borrowing options, particularly when the access offers a less expensive MI alternative to the borrower, is in the public interest. It also reduces reliance on taxpayer-supported insurance options.

Additionally, there is no substantive difference between private MI and Government mortgage insurance which justifies the unequal treatment

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[42] Section 15G(e)(1)-(2).

[43] Even a partial acceptance of MICA's QRM proposal underlines the need for this exemption. For example, the alternative definition of a QRM presented in the NPR (at 24129, Questions 143-49) would exclude more than 50% of the MI industry's recently underwritten business, largely for LTV reasons. Substantially all of the FHA's business is written at 95% or greater LTVs. Ignoring this reality is inconsistent with increasing (or even maintaining) the role of private capital in low down payment lending.

[44] Bond insurers do not provide the process oversight and loan-level focus offered by the MI industry, as evidenced by the numerous lawsuits arising from soured securitizations and contentions regarding the amount of underwriting diligence owed.

proposed by the NPR. Dodd-Frank simply exempts "any residential mortgage loan asset… which is insured or guaranteed by the United States or an agency of the United States".[45] The exemption is not dependent on underwriting standards or loan terms, and so by itself does not promote prudent underwriting. Neither the legislative history of Dodd-Frank nor any independent objective data have maintained the superiority of Government mortgage insurance from a credit risk management perspective. Indeed, longstanding interest regarding FHA reform is based on the perceived need to equip the FHA with the underwriting and risk management tools already used by MI companies. Because the FHA (and other Government mortgage insurance programs) exemption is a statutory one provided by Dodd-Frank, "leveling the playing field" requires regulatory action by the agencies.[46]

MICA's request regarding an exemption for MI is also important now that US housing policy favors increasing the role of private capital. Lenders simply do not offer low down payment loans without additional security such as MI or FHA backing. There is no other alternative to MI for management of the credit risk associated with low down payment lending. If US housing policy wishes to emphasize private capital, the treatment of MI must be considered in light of the FHA exemption.

MICA recognizes an exemption for loans insured by MI should be accompanied with suitable measures to ensure protection of investors, which is why we support the eligibility requirements outlined in Section VI below and counterparty financial integrity requirements established and monitored by state insurance regulators, the only group of financial regulators in the US with regulatory and supervisory experience regarding MI, as further detailed in Appendix 2.

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[45] 15G(e)(3)(B).

[46] NPR at 24136. The agencies suggest that loans insured by government MI and securitized by a private entity would be treated as exempt. NPR at 24137. MICA supports this reasoning even if it is extremely unlikely that a private securitizer would be willing to match Ginnie Mae's guarantee fee of 6 basis points. See Ginnie Mae Frequently Asked Questions, available at http://www.ginniemae.gov/media/ginnieFAQ.asp?Section=Media. However, MICA also urges the agencies to clarify that a securitization guaranteed by Ginnie Mae (*i.e.*, "the United States or any agency of the United States") that includes loans insured by MI also would qualify for exemption from risk retention. Such an alternative might offer attractive possibilities to reduce the role of Government MI in the US housing finance system.

V. MI Should Be Included as a Permissible Form of Risk Retention for Non-QRM Loans.

This portion of the MICA response is directed to Questions 69(a) and 90 of the NPR.

The Dodd-Frank Act created a variety of general and asset-specific forms of risk retention. Congress expressly provided for third parties to be treated as "risk retainers" in Dodd-Frank. Both the Treasury and Federal Reserve raised the possibility of third-party credit enhancement providers as "risk retainers" in their reports on risk retention required by Dodd-Frank. A first loss provider like MI has sufficient skin in the game to meet the incentive alignment with the originator, securitizer and investor as envisioned by Congress in the construction of Section 941 and should be considered as a permissible form of risk retention. In effect, MI offers a "thicker" (*i.e.,* 2-7 times more) form of horizontal risk retention than the 5% proposed in the NPR, and the retention is enhanced further by third-party oversight – providing a justification similar to that applied to the use of third-party risk-takers in commercial mortgage-backed securities.[47] Additionally, MI is structured to promote real skin in the game from loan originators and mortgage investors because MIs have in the past covered only 20% to 25% of the valid claim amount (generally equal to the outstanding loan balance plus certain foreclosure related expenses) which during periods of severely declining house prices does not cover the full loss after the loan is sold in foreclosure and the MI pays its agreed-upon claim amount.

Thus, MI should be allowed as an asset-specific form of risk retention, following the precedent set by third-party B-piece buyers of CMBS.

VI. MI Should be Subject to Eligibility Requirements

This portion of the MICA response is directed to Questions 112 and 151.

Including MI within the final risk retention rule as proposed by MICA requires MI to be a durable source of risk mitigation expertise and risk retention capacity. For this reason, MICA suggests recognition of "qualified MI". Qualified MI is defined as insurance covering the first loss exposure on a residential mortgage loan which meets the following criteria:

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[47] NPR at 24109-11. The justifications used by the SEC in its economic analysis discussion of CMBS B-piece risk retention can be applied with equal force to the use of MI within the residential mortgage asset category. NPR at 24153.

- The MI company should be in good standing with its state domiciliary regulator. Within the context of a multi-state regulatory system, the domiciliary regulator asserts the most supervisory authority, receives the most financial and operating information, undertakes periodic financial/operational assessments and makes judgments on qualitative aspects not easily reduced to a "requirement". The domiciliary regulator is the linchpin of the state insurance regulatory system. Any business written outside the domiciliary jurisdiction requires a license, which allows regulators in those jurisdictions to impose additional prudential and market conduct requirements. Further description of the regulatory regime applicable to MI companies (including capital and reserves) is available in Appendix 2 to this response.
- Adequate MI coverage must be obtained. At a minimum 20% coverage must be obtained to cover the basic costs of a mortgage foreclosure (*i.e.*, accrual of unpaid interest, foreclosure fees, property maintenance, real estate disposition fees and legal fees). Customary coverage (also known as standard coverage)[48] provides coverage for normal foreclosure costs in addition to covering modest home price decline. Although not specified in the legislative history of Dodd-Frank, Congress likely was assuming standard coverage in its references to MI. "Deep coverage", or a greater level of insurance protection than that provided by standard coverage but less than the 100% protection provided by the FHA, also might be considered within the context of an expanded QRM definition for investor protection purposes. Deep coverage likely would cover substantially all the loss in most foreclosures, including those experienced in the ongoing housing market downturn.[49]

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[48] 35% for 97% LTV loans (bringing the initial exposure down to 63%), 30% for 95% LTV loans (exposure down to 66.5%), 25% for 90% LTV loans (exposure down to 67.5%), and 12% for 85% LTV loans (exposure down to 74.8%).

[49] See Milliman Client Report, *Mortgage Cohort Credit Loss Analysis as of September 2010*, April 1, 2011 prepared for Mortgage Insurance Companies of America in Appendix 7. This analysis analyzed the loan level pricing fees imposed by the GSEs on borrowers, which are supplemental to the MI insurance coverage on the subject loans. The study reviewed the performance of loans originated from 1998 through 2010. Part of this analysis determined the projected loss severity for loans subject to varying levels of deeper MI coverage with simulated average present value loss rates net of mortgage insurance varying from 0.88%, for loans with the current standard MI coverage, to 0.06% where deeper MI coverage sufficient to bring the initial LTV down to 35%, which indicates a significantly reduced risk of loss beyond current coverage levels to what may be considered essentially negligible loss rates.

- It is important to note that deeper MI coverage levels that bring the initial LTV below 60% will not undermine the incentive of the lender to originate loans that comply with the MI underwriting requirements at the time of origination. Failure by a lender to meet these requirements allows for rescission of the loan when a request for a claim payment is made to the MI. Similarly, unlike FHA insured loans, MI insured loans with deep coverage continue to put the lender at risk for losses on individual loans which exceed the coverage amount.
- The insured loan must have been underwritten according to the MI company's specified underwriting guidelines.

MICA's suggested combination of MI company regulatory compliance, minimum coverage levels and adherence to rigorous credit underwriting discipline ensures a higher standard than that available simply from specifying financial requirements for MI companies. MICA's suggestions assure robust incentive alignment with originators, securitizers and investors as well.

VII. GSE Guarantees Should be Recognized as Permissible Risk Retention

This portion of the MICA response is directed to Question 79.

MICA supports the NPR's provisions that make a guarantee by Fannie Mae or Freddie Mac a permissible form of risk retention under the conditions provided in the NPR.[50] The proposed GSE treatment is critical in practical terms given the centrality of the GSEs to the current housing finance system. The proposed treatment is defensible from a risk retention perspective as well. The risk retained by the GSEs under their guarantees to investors (coupled with conservatorship oversight and US Government financial support to assure investors that the guarantees are money-good) is consistent with the incentive alignment sought by the agencies in the NPR.

[50]NPR at 24111-12.

VIII. Hedging and Transfer Restrictions Should Concentrate on Incentive Effects

This portion of the MICA response is directed to Questions 80-81 and 96-105 of the NPR.

The NPR's proposed restrictions on hedging or transferring credit risk retained are broadly appropriate. MICA believes the agencies should clarify the intended purpose of the hedging/transfer restrictions as promoting positive incentive effects. To that end, MICA suggests the agencies require a documented justification or preapproval for any hedge or transfer proposed, and any hedging or transfer activity should be subject to anti-abuse standards. The suggested justification is based on the proposed "Credit Risk Retention" description proposed for the GSEs,[51] but making the description mandatory for all securitizers. The justification should include a clear statement that the hedging or transfer activity is not materially related to the credit risk required to be retained.[52] MICA recognizes the benefits of this process must be balanced against the burdens of compliance, so we would urge a menu of compliance alternatives (*e.g.,* preapproval and an after the fact justification could have different disclosure standards, and reviews could be done on a program basis).

Regarding the hedging and transfer provisions generally, MICA agrees that the issuing entity should not be considered a consolidated entity for purposes of applying the hedging restrictions. Specifically, MICA supports the reasoning presented in footnote 111 regarding MI, which is obtained at or shortly after origination and generates the positive incentive effects discussed elsewhere in this response.

Alternatively, MICA proposes a simpler approach to MI drawn from the European Union's counterpart legislation on credit risk retention, where MI is not considered to even be a hedge, but instead considered to be a "prudent element of credit-granting". Indeed, at a time when commentators have expressed growing concerns regarding the divergence between US and European Union positions on financial regulation,[53] MICA strongly commends the reasoning used in Article

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[51] NPR at 24112.

[52] NPR at 24116. Additionally, MICA suggests that agency guidance would be helpful to clarify the meaning of "materially related" and other terms likely to recur in the preparation and discussion of any proposed hedge or transfer.

[53] See, e.g., Morrison/Foerster, Transatlantic Navigation of Securitization Reforms: A Guide (May 10, 2011), available at: http://www.mofo.com/files/Uploads/Images/110510-Transatlantic-Navigation-of-Securitization-Reforms-A-Guide.pdf.

122(a) of the EU Capital Requirements Directive 2009/111/EC regarding MI:

> In securitizations of trade receivables, originators sometimes purchase external credit insurance as part of the normal operating business. Similarly, **mortgage guarantee insurance is sometimes taken out in respect of a pool of mortgage loans. Such types of insurance need not necessarily be considered to be "hedges" of the underlying exposures, if undertaken as a legitimate and prudent element of credit-granting, and if their usage does not create a specific differentiation between the credit risk of (or the alignment of interest between) the retained positions or exposures and those positions or exposures that are sold to investors**. For instance, mortgage guarantee insurance need not be considered a "hedge" when loans in the pool of mortgages securitized – and to which both the originator and investors are equally exposed – benefit from such insurance. However, it could be considered a hedge if the securitized exposures do not benefit from mortgage guarantee insurance, but the exposures retained on balance sheet under option (c) do benefit from mortgage guarantee insurance. Similar considerations should apply to other forms of guarantee or insurance from which the exposures or positions of a securitization may benefit.[54] (Emphasis supplied).

The EU approach regarding private MI concentrates on incentive effects, and for that reason represents an attractive possibility for use by the Agencies in the final risk retention rule.

IX. Procedural Considerations

MICA would like to raise an important concern regarding the process undertaken with this NPR. Specifically, sweeping regulations of this sort are subject to Executive Order 12866[55] and Executive Order 13563[56] with regard to actions by agencies of the executive branch. Further, on July 11, the President extended the rationale of Executive Order 13563 to independent agencies, including the FRB, FHFA and FDIC.[57] However, the NPR only addresses Executive Order 12866 in

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[54] Paragraph 42 of Committee of European Banking Supervisors, Guidelines to Article 122a of the Capital Requirements Directive (December 31, 2010), available at http://www.eba.europa.eu/cebs/media/Publications/Standards%20and%20Guidelines/2010/Application%20of%20Art.%20122a%20of%20the%20CRD/Guidelines.pdf.

[55] Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).

[56] Exec. Order No. 13,563, 76 Fed. Reg. 3,821 (Jan. 21, 2011).

[57] Exec. Order No. 13,579, 76 Fed. Reg. 41,587 (July 14, 2011).

passing, noting that the Office of Management and Budget (OMB) has reviewed this issue and providing contact information from which to obtain HUD's analysis to the degree the NPR has a significant economic impact. HUD informed MICA that the NPR meets the conditions of economic significance under Sec. 3(f)(1) of Executive Order 12866 based on the rule itself, so nothing other than the NPR is available for review on HUD's electronic docket. Inasmuch as MICA is interested in understanding the agencies' rationale for its proposed treatment of MI, the summary dismissal of MI in the NPR falls short of the expectations created by the provisions contained in Executive Orders 12866, 13563 and 13579.

Although we understand that several Inspectors General have considered this issue following requests from Congress,[58] the NPR provides no indication of the degree to which the Executive Orders were met. Executive Order 13563 was issued earlier this year by President Obama (prior to the NPR) to ensure that federal rulemakings are transparent, especially with regard to the technical analyses on which they are premised. Executive Order 13579 urges the independent agencies involved in the NPR to act within the spirit of the earlier Orders. MICA would note that a critical issue in this NPR is the degree to which MI reduces the risk of default.[59] FHFA has provided public data on this point,[60] but the other agencies have failed to do so. MICA believes the FHFA analysis is flawed in numerous respects (most notably by FHFA data limitations since data derived from the government-sponsored enterprises lack necessary comparisons between

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[58] Board of Governors of the Federal Reserve System, Office of Inspector General, Response to a Congressional Request Regarding the Economic Analysis Associated with Specified Rulemakings (June 13, 2011), *available at* http://www.federalreserve.gov/oig/files/Congressional_Response_web.pdf; Securities and Exchange Commission, Office of Inspector General, Report of Review of Economic Analyses Performed by the Securities and Exchange Commission in Connection with Dodd-Frank Act Rulemakings (June 13, 2011), *available at* http://www.sec-oig.gov/Reports/AuditsInspections/2011/Report_6_13_11.pdf; Department of the Treasury, Office of Inspector General, Dodd-Frank Act: Congressional Request for Information Regarding Economic Analyses by OCC (June 13, 2011), *available at* http://www.treasury.gov/about/organizational-structure/ig/Documents/OIG-CA-11-006.pdf.

[59] Securities Exchange Act of 1934, section 15G(e)(4)(B)(iv) *as created by* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, section 941(b) (2010). The DC Circuit's assessment of the Commission's justifications for its actions in other regulatory matters suggests supplemental analysis might be merited regarding the Commission's economic analysis offered in the NPR. See fn 8 above and NPR at 24149-55.

[60] Patrick Lawler, *prepared testimony before the House Committee on Financial Services Subcommittee on Capital Markets, Insurance, and Government-Sponsored Enterprises* (Apr. 14, 2011) *available at* http://financialservices.house.gov/media/pdf/041411lawler.pdf.

comparable LTVs with or without private MI). If there are other data on which the agencies relied, these should be made public to inform final rulemaking on this critical issue.

Additionally, the NPR raises important issues regarding how and where the costs of the final rule might fall on current and prospective borrowers. The agencies have rightly sought views on this issue. MICA urges careful consideration of them, as well as consultation with OMB, to prevent any undue distributive impact of the final rule in violation of Executive Orders 13563 and 13579.

X. Conclusion

The MI industry has been a long-standing and vital part of the US housing finance industry. Not only does MI help families, many of whom are first-time buyers or lower-income borrowers, prudently buy homes, it protects investors by reinforcing originator and securitizer incentives to act properly and by reducing the frequency and severity of default. For the reasons and analysis provided in this response, MICA urges the agencies to incorporate the following recommendations in the final rule implementing Section 941 of Dodd-Frank:

1. Expand the QRM definition to include purchase and rate and term refinance loans up to 97% CLTV (with MI required on loans above 80% CLTV) and to include loans with a back-end debt-to-income ratio of up to 45%.
2. Maintain the prohibition against the use of a junior lien in conjunction with a QRM to purchase a home.
3. Exempt all mortgages backed by MI from risk retention.
4. Include qualified MI as a permissible form of risk retention for non-QRM loans.
5. Maintain the GSE exemption as proposed.
6. Clarify hedge restrictions.
7. Make all related agency analytics, research and reports public per applicable Executive Orders.

Sincerely,

Appendices:

1. Natter Report: *What Was the Legislative Intent behind the QRM?*

2. Regulatory and Capital Structure of Private Mortgage Insurance

3. Genworth Study: *MI Impact Analysis*

4. Promontory Study: *Assessing the Delinquency and Default Risk of Insured and Non-Insured High LTV Mortgages*

5. Milliman Study Addressing the Technical Analysis of the Role of Private Mortgage Insurance in Reducing the Frequency of Default: *Mortgage Insurance Loan Performance Analysis as of March 2011*

6. Review of Technical Analysis by Professor William Poole

7. Milliman Client Report, *Mortgage Cohort Credit Loss Analysis as of September 2010* (April 1, 2011), prepared for Mortgage Insurance Companies of America

Our Perspectives:
Commentary on the economy & regulatory policies affecting financial companies

Barnett Sivon & Natter P.C.
ATTORNEYS at LAW
WASHINGTON, DC

What Was the Legislative Intent Behind the QRM?*

Ray Natter

June, 2011

One of the often repeated allegations made after the collapse of the housing markets in 2008 was that the securitization led to the poor underwriting witnessed during the housing boom years. It soon became conventional wisdom that mortgage securitization was at fault because the mortgage lender did not have "skin in the game," and therefore was willing to write loans based on inflated statements of income and without necessary documentation. As a result, Congress included in the Dodd-Frank Act an amendment to the Securities Exchange Act of 1934 that requires securitizers to retain a 5 percent interest in the credit risk of assets that are sold into a securitization. The percent of risk retention can be changed by the regulators, and the regulators are given flexibility in implementing this requirement. In addition, the agencies are directed to jointly define a "qualified residential mortgage" or "QRM" that would be exempt from the risk retention requirement.

In March of this year, the regulatory agencies published a proposed regulation pursuant to which the QRM was given a very narrow definition. Qualified residential mortgages would require a substantial down payment — 20 percent of the purchase price — borrowers would have to have a pristine credit history and would have to meet tough debt to income ratios. The regulators explained that the legislative intent behind the QRM was for it to be a very narrow exception to the risk retention requirement, and that the general rule was that mortgage securitizations would be subject to the risk retention mandate. The regulators also explained that by having a stringent test for the QRM, it would leave a large number of well underwritten loans outside of the QRM basket, and thereby would enable a private secondary market to develop that would securitize these non-QRM mortgages.

The publication of this proposal created a storm of opposition from mortgage lenders, real estate agents, consumer groups, civil rights groups and others who protested that non-QRM loans would be more costly, and would

*The information contained in this newsletter does not constitute legal advice. This newsletter is intended for educational and informational purposes only.

have a disproportionate adverse impact on first-time homebuyers, on minorities, and on low- and moderate-income families that could afford mortgages under traditional standards, but would now be shut out of the market. These groups argued that the legislative intent was for a broad QRM that would cover a large swath of creditworthy borrowers, but that the QRM would exclude the loan products that were at the root of the mortgage failures, such as no-doc and low-doc loans, interest only loans, and loans with negative amortization.

In light of this debate about the legislative intent behind the QRM, I decided to look at the relevant documents myself, to see if I could determine the motivation behind this exemption based on the legislative history of the Dodd-Frank Act. I found that the pre-enactment legislative history was very clear. Congress was seeking a broad exemption that would include almost all well underwritten mortgage loans that complied with pre-boom year standards.

The QRM provision was not included in either the House bill or the Senate bill as reported from the Senate Banking Committee. It was added to the Dodd-Frank Act during the Senate debate on the legislation as a floor amendment. During the debate, it became clear that many Senators, on both sides of the aisle, were very concerned that risk retention would "shut down the securitization process and make less credit available."[1] One remedy came in the form of an amendment offered by Senator Corker. His amendment would have replaced the risk retention requirements with a mandatory 5 percent down payment requirement, and a study by the Federal Reserve Board on the asset-backed securitization process.[2] The Corker amendment failed, *in large part because of concern that a 5 percent down payment requirement was viewed as too restrictive.* Speaking against the amendment, Senate Banking Committee Chairman Dodd stated:

> [T]he [Corker] amendment puts in government-dictated, hard-wired underwriting standards that would have very serious consequences, . . . for first-time homebuyers, minority home buyers, and others who are seeking to attain the American dream of home ownership. . . .

[1] See, e.g., Statements of Senator Corker and Senator Isakson at 156 Congressional Record S3514 (May 11, 2010).

[2] Amendment No. 3955, 156 Congressional Record S3551 (May 11, 2010).

> . . . [I]t does this at a time, as we all know, that the housing markets are just starting to recover, potentially putting that recovery at risk.
>
> * * *
>
> Many insured depositors (sic), of course, have mortgage programs that require less than 5 percent down payment. They are performing well, and have done so in the past. And we want low- and moderate-income families to go to banks and get loans, qualified low- and moderate-income people . . . We do not want to simply shut them off to nonprofits. We want to get them into the financial mainstream.
>
> The Corker amendment would create a new barrier to accomplishing that goal.[3]

Senator Merkley also argued strenuously against a mandatory 5 percent down payment. He urged that the Senate adopt an amendment offered by himself and Senator Klobuchar in lieu of the Corker amendment.[4] The Merkley-Klobuchar amendment contained more flexible mortgage underwriting standards, as well as a requirement to verify income and assets, but no minimum down payment requirement. As explained by Senator Merkley:

> I do think it is important to recognize that the bulk of what Senator Corker addressed [in his amendment] goes right to the heart of [my] amendment as well. There is a point of distinction between the two amendments, a critical point of distinction; that is, the 5-percent underwriting absolute line. That line is a line of great concern for those of us who have had experience with first-time home buyers, those who have had experience with families who are at the bottom of the income spectrum. . . . So the inflexibility of that standard is a great concern.[5]

Based on these arguments, the Corker amendment was defeated by a vote of 42-57, and the Merkley-Klobuchar amendment was adopted by a vote of

[3] 156 Congressional Record S3518, and S3520.

[4] Amendment No. 3962, 156 Congressional Record S3552 (May 11, 2010).

[5] 156 Congressional Record S3516 (May 11, 2010).

63-36.[6] Thus, when faced with the clear choice between a mandatory down payment requirement and more flexible underwriting, the Senate voted for the more flexible approach. The debate on the Corker amendment shows that the concept of a mandatory down payment requirement was specifically rejected, and that such leaders as Chairman Dodd of the Senate Banking Committee argued strongly against imposing such a requirement. His views prevailed when the amendment was defeated

Soon after the defeat of the Corker Amendment, the Senate took up an amendment offered by Senators Landrieu and Isakson, among others.[7] This is the amendment that created an exemption for Qualified Residential Mortgages, and can be found, with minor changes, as section 941 of the Dodd-Frank Act.

Senator Isakson explained that the QRM exemption was necessary because he believed that risk retention would not work in practice, and therefore without a QRM there "would be no loans."[8] Obviously, this view is not consistent with the position that the QRM was intended to be a narrow carve out for only the very strongest loans. Rather, since the concern behind the amendment was that no loans would be made subject to a risk retention requirement, then QRM loans should encompass the vast majority of loans that meet traditional underwriting standards.

The concept was made clear by Senator Isakson, who stated that the amendment would force lenders to go back to "good-old-day" loans where the borrower is qualified to borrow the money. As a result, "the only risk retention that will be required is when someone is making a bad loan, which means people will stop making bad loans."[9]

Senator Isakson explained what he considered to be a "good-old-day" loan as one in which the borrower's income is verified, the borrower has ratios that meet the tolerance levels for a qualified loan, there is equity of 20 percent in every loan, either through a down payment or if the down payment is less than 20 percent, having mortgage insurance; in other words,

[6] 156 Congressional Record S3574 (May 12, 2010).

[7] Amendment No. 3956, 156 Congressional Record S3575 (May 12, 2010). The amendment was co-sponsored by Senators Hagan, Warner, Menendez, Tester, Lincoln, Levin, Burr and Hutchison.

[8] 156 Congressional Record S3576 (May 12, 2010).

[9] Id.

by returning to "*the way things used to work.*"[10]

The Landrieu-Isakson amendment was not opposed by any Senator, and was agreed to by consent without a roll call vote.[11] In approving the final bill, the Conference Committee retained the Landrieu-Isakson amendment with minor changes.[12] One change was to specifically cross reference the standard for a "qualified mortgage" in Title XIV of the Dodd-Frank Act, which relates to underwriting standards applicable to all mortgage originations. The cross reference provides that the QRM may be no broader than the standard for a qualified mortgage in Title XIV.[13]

In summary, the legislative history of the QRM is clear. The sponsors of the amendment were of the belief that the risk retention requirement would inhibit mortgage securitization to such an extent that virtually no mortgages would be securitized. The QRM was intended to prevent this result by exempting "good-old-day" loans from risk retention. A "good-old-day" mortgage was conceived as a loan that was underwritten "the way things used to work," i.e., fully documented, appropriate debt to income ratios, down payment requirements that consider private mortgage insurance, and the other traditional underwriting criteria.

As noted, the Conference Committee essentially adopted the Senate amendment. There is no legislative history or other indication that the Committee sought to change the basic goal of the amendment: to create a QRM that encompasses all of the "good-old-day" mortgage loans that are underwritten under the traditional standards used prior to the housing boom of the mid-2000s. The QRM was never intended to only include a narrow class of super-high quality loans, and it was never intended to impose high down payment requirements that would adversely affect first-time homebuyers and economically disadvantaged groups. In fact, an amendment that would have imposed a hard wired minimum down payment was specifically rejected.

This conclusion is directly supported by a statement by Senator Isakson made on the Senate floor following final passage. In this statement, Senator Isakson explained the intent behind the amendment as follows:

[10] Id.
[11] 156 Congressional Record S3625 (May 12, 2010).
[12] House Report No. 111-517, (June 29, 2010).
[13] Section 15G(d)(4)(C) of the Dodd-Frank Act.

> Earlier this year, I began working with Senators *Landrieu* and *Hagan* to develop the concept of a qualified residential mortgage, QRM or, as I call it, a "new gold standard" for residential mortgages, which ultimately was included in the credit risk retention title of 941(b) in the financial reform bill. While risk retention can serve as a strong deterrent to excessive risk taken by lenders, it also imposes the potential of a constriction of credit in the mortgage market.
>
> I want to make this point clear. The risk retention provision of the Dodd-Frank bill would require an originator of a mortgage to retain 5 percent of that mortgage as risk retention. . . . What is going to happen is that very few mortgages will be made, and those that will be made will be only the most pristine ones, not necessarily the ones that meet the needs of middle America. . . .
>
> . . . But in terms of mainstream America, we need to go back to the good old days of the 1960s, 1970s, and 1980s, . . .
>
> . . . [T]he easy underwriting that started in 2006, and then accelerated, caused us lots of problems. That is what we are here to try to stop today. I am optimistic that our amendment will be the first step to correct the lending practices of the past and will set on a better path in the future. . . .
>
> . . . It is my hope that these regulators will follow the intent of the legislation, by ensuring a broad spectrum of qualified borrowers will fit under the umbrella of protection under the qualified residential mortgage safety and soundness provisions.[14]

An objective review of the pre-enactment legislative history that Senator Isakson's statement accurately reflects the legislative intent as expressed during the floor debate, and therefore should serve as a guide to the regulatory agencies implementing the QRM provisions.

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[14] 156 Congressional Record S10441 (Dec, 17, 2010); italics added

Appendix 2:

Private Mortgage Insurers are Subject to Rigorous and Long-Standing Capital and Regulatory Requirements[1]

The primary framework for state regulation of MI is the Mortgage Guaranty Insurance Model Act (the "Act") promulgated by the National Association of Insurance Commissioners (the "NAIC"). It has been adopted in significant part by sixteen states, including the four states that serve as domestic regulators of MI, *i.e.*, Arizona, North Carolina, Pennsylvania[2] and Wisconsin. The Act establishes financial, operational and risk management requirements applicable to MIs that have been developed for the unique challenges posed by a type of insurance that provides long term default loss protection (with no premium adjustments) on residential mortgage credits. As described in greater detail below, the Act:

- Requires mortgage insurers to be monoline, in order to segregate their premiums and liabilities from other lines of insurance and to improve transparency to policyholders;

- Imposes protections against conflicts of interest, including limitations on insuring affiliates and paying commissions;

- Establishes risk management protections, including measures prohibiting geographic concentrations of risk and investment restrictions to prevent "doubling down" on mortgage credit risk; and

- Prescribes an integrated capital and reserving approach, including risk-to-capital (or the substantially equivalent minimum policyholders' position), contingency reserves (in which 50% of earned premium for each reporting period is held for ten years unless used as additional source of claims payments during adverse loss years), and a progressive reserving policy intended to promote regular disclosure and establishment of adequate reserves for loss on delinquent, insured loans.

In addition to the states, the Act has also been relied on by other constituencies to establish appropriate capital and counterparty risk standards. For example, Mexico used

[1] Additional background information on the comprehensive regulatory framework applicable to MI and MI companies may be found in the Promontory paper entitled "The Role of Private Mortgage Insurance in the US Housing Finance System," available at http://www.promontory.com/assets/0/78/110/286/974d1fb8-ac46-413e-a62a-4b5472f4df14.pdf.

[2] Important insurance jurisdictions from a policy-setting and premium-generating perspective such as New York and California have adopted the Act.

the Act in establishing a mortgage guaranty industry,[3] and the GSEs require compliance with certain provisions of the Act in their respective eligibility requirements for MIs.[4] Under the Act, as adopted in modified and/or supplemented form by the sixteen (16) states that directly regulate mortgage insurance, MI companies are subject to a comprehensive set of financial regulations and oversight by state insurance regulators, which provisions address capital and permitted investments, loss reserving, financial condition and product rates and restrictions. Together, the insurance laws/regulations and the mandated supervisory activities of our regulators provide a strong financial and regulatory oversight process to ensure that MIs operate in a stable and secure manner for the benefit of their policyholders and beneficiaries (in this case, investors in RMBS). In addition to minimum capital and surplus requirements (which typically, depending on the state, are in the range of $2 to $5 million), the laws enacted in several jurisdictions establish either maximum risk-to-capital ("RTC") requirements or the substantially equivalent minimum policyholder position ("MPP") requirements to ensure that MI companies maintain a sufficient capital position to be permitted to continue transacting insurance. The RTC/MPP provisions essentially requires MIs to operate at insured risk-to-capital ratios not to exceed 25:1 or to receive temporary written waivers from regulators if they anticipate that they will exceed this level. (Thus, an MI company with $10 billion in insured risk is required to maintain capital of not less than $250 million. In this definition, only capital on the company's balance sheet is permitted in the calculation; no unearned or future premium collections can be included. Historically, MI companies have operated at much more conservative RTC ratios, *i.e.*, less than 10:1 during the earlier part of this decade.) Waivers are only issued if an MI company is able to demonstrate to its regulators that its capital is reasonable in relation to its aggregate risk and adequate for its financial needs. The RTC/MPP requirement serves as an early warning signal to regulators that an MI company may be operating at an excess leverage ratio and that regulatory action may be warranted.

In addition to capital requirements, MI company investments are limited to non-mortgage related, highly rated and liquid securities and the ability of MI companies to pay shareholder dividends is also subject to regulatory review and approval. The Act and related state provisions establish clear requirements for MI company loss reserves. These loss reserves must equal an estimate of loss for all insured loans reported and unreported and in a condition of default on the date the reserves are calculated. In addition, MI companies are required to maintain contingency reserves equal to fifty percent (50%) of net earned premium for a period of ten (10) years or until approved for earlier release for excess loss or extraordinary conditions by applicable state insurance

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[3] See Carlos Serrano, Public and Private Partnerships in Mortgage Insurance: Lessons from Mexico's SHF Experience, Housing Finance in Emerging Markets Conference (World Bank: March 2006), at http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/FSLP/0,,contentMDK:20735621~pagePK:64156158~piPK:64152884~theSitePK:461005,00.html.

[4] For Fannie Mae, see https://www.efanniemae.com/is/mis/miapprovalreqs.jsp. For Freddie Mac, see http://www.freddiemac.com/singlefamily/pdf/mireqs.pdf. Both Fannie Mae and Freddie Mac have used these requirements in an advisory rather than a binding capacity recently, and each is in the process of updating their requirements. However, each has relied heavily on the Model Act for development of their requirements, and it is likely any update will retain that reliance.

departments. Contingency reserves provide an extra capital cushion, which greatly increases the ability of MI companies to withstand periods of increased claims due to stress in the general economy and/or housing markets. Recent experience demonstrates the effectiveness of this requirement.

States also require MI companies to maintain miscellaneous reserves (for the amount of additional reserves required by the laws of another jurisdiction), unearned premium reserves and premium deficiency reserves (if applicable). State laws regulate reinsurance of MI business, limiting the companies to which a MI company may cede business, and requiring licensing, reserves and other solvency requirements to be satisfied. The MI company is further required to file reports on its reinsurance agreements with certain insurance departments as part of its quarterly and annual financial statements.

MI is required to be written on a monoline basis to ensure that premium, capital, and reserves are used only for payment of claims on loans insured under MI policies. MI companies are limited in the geographic concentration of the risks they write. Policy forms and premium rates are subject to review and approval by many states, including the MIs' state of domicile. As MI is typically written on a nationwide basis, the MI company can expect to wait for prior approval of both rates and forms by several sets of state regulators before it can implement a nationwide rate change. The rate review standards are typically in place to ensure that the rates applied are not excessive, inadequate (such that the rate is insufficient to sustain projected losses and expenses and so may impact insurer solvency) or unfairly discriminatory.

To ensure that MI companies are operating in compliance with state laws, insurance departments are required to conduct financial examinations of its domestic MI companies at least once every three to five years. The NAIC provides state regulators a forum within which to establish model examination and financial reporting standards and to share financial and market conduct compliance information regarding insurance entities, promoting the application of consistent regulatory and financial oversight requirements among the states. A number of actions are prescribed if it is determined that an insurer is in a hazardous financial condition, including, but not limited to, orders to reduce or suspend new business, increase capital and surplus, or obtain reinsurance. These regulations act as an early warning system to detect and impose remedial actions on insurers well before they are threatened by insolvency.

In summary, MI is a well regulated, counter-cyclical source of loan level protection provided for residential mortgage loans based on independent underwriting criteria. It is for this reason that global regulators have repeatedly reviewed and then confirmed the value of properly-regulated and appropriately-capitalized MI. For example, in January of 2010,[5] the Joint Forum, which is an advisory committee comprised of global banking, securities and insurance regulators, urged member nations to ensure that greater use of MI is part of their mortgage reform efforts. In addition to urging greater use of MI, the

[5] The Joint Forum, *Review of the Differentiated Nature and Scope of Financial Regulation - Key Issues and Recommendations,* (Jan. 8, 2010), *available at* http://www.bis.org/publ/joint24.pdf.

Joint Forum paper described the need to ensure that capital credit and regulatory recognition is provided only when private MI is in fact well regulated and capitalized, noting the significant problems that result from reliance on products such as credit derivatives.

The Joint Forum's advisory work has since been embraced as a firm recommendation from the Financial Stability Board (FSB),[6] the governing body for all global financial regulators (including those in the US). In its final paper detailing recommendations for mortgage underwriting, the FSB concludes that, "[m]ortgage insurance can be relevant for the reduction of uncertainty through risk selection and pricing, a prudent application which includes an in-depth assessment of mortgage insurance reliability. The recent crisis has shown how deceptive risk transfer mechanisms can be."[7]

[6] Financial Stability Board, *Thematic Review on Mortgage Underwriting and Origination Practices* (Mar. 17, 2011), *available at* http://www.financialstabilityboard.org/publications/r_110318a.pdf.

[7] Ibid, p. 25.

Performance of Insured vs Piggyback Mortgage Loans

Genworth Financial

August 2010

Study Concept Summary

Genworth is pleased to report a more thorough examination of the differences in insured loan versus piggy back loan performance.
The Original study focused on 30+ delinquencies over four origination years with cuts by origination year, CLTV, and FICO, and two geographic cuts.
The sub group combination differences were then weighted by the overall volume of both insured and piggy-back loans in each segment,
and then rolled up to display the relative differences in performance given the specific segmentation. Overall that study suggested
that piggy-back loans performed 55% worse than insured loans with similar characteristics.

This revised study now focuses on ever 90+ delinquency rates and the cure rates on loans ever 90 days delinquent. The new study adds
an additional origination year, 2003, and more importantly, adds additional characteristic cuts such as document type, loan purpose, and expands
the geographic breaks to the nine US Census regions. The overall number of possible combination sets therefore increases nearly 20 folc
going from 256 combination segments to 5,040 in this expanded study.
This greater degree of detail should have the effect of removing the effects of differences in the distributions of insured loans relative to piggy-back loans.
Theoretically, increasing the degree of segmentation should move the overall weighted ratio of performance directionally from the 1.55 in the former study closer to 1.0.

The new study also differs from the former in that the older study used the total volume of both the insured and piggy-back loans to weight
the ratios of each identified segment. However, with a 20 fold increase in segmentation, and because piggy-back loans were smaller in volume than insured loans
some segments had extremely low piggyback volumes where it it would be entirely possible for all or none of the loans to be delinquent.
Consequently, the use of total volume weights (piggyback plus insured) would distort the effects of differences in the distribution of piggy-back loans.
For instance, for the 2003 originations 100 CLTV loans accounted for 48.9% of both the insured and piggy back volume for 2003. However, Piggy-back loans with
100% CLTV were only 17.8% of the 2003 piggy volume. Using the total volume would over-weight CLTV 100 ratios, whereas using the piggy-back volume would
put the relative difference in 100 LTV performance in a more appropriate perspective.

The other major component of this updated study is the inclusion of an analysis of the cure rates on loans ever 90 days delinquent.
The study will show that even for segments where there is little difference in ever 90+ delinquency rates, MI insured loans
exhibit significantly higher cure rates, thereby affecting the ultimate foreclosure rates on such segments. The expertise and willingness
of MIs to work with delinquent insured borrowers plays a major role in reducing the real risk of default on high LTV loans.

Study Composition

Total Volumes Of Originations	Piggy-Back Volume	$260.6 billion	Insured Volume	$588.9 billion	**Total Volume**	**$849.5 billion**
Numbers of Loans		1,045,328		3,872,318		4,917,646

Expanded Study On Ever 90 Days Delinquent And Subsequent Cure Rates	Original Study On 30+ Delinquency Rates
5 Origination Years 2003 - 2007	4 Origination Years 2004 - 2007
2 Documentation Types : Full Docs, Low or No Docs	
2 Loan Purpose Categories: Purchase, Refinancing (Other was excluded)	
4 CLTV Ranges : 80.1 to 85, 85.1 to 90, 90.1 to 95, GT 95	4 CLTV Ranges : 80.1 to 85, 85.1 to 90, 90.1 to 95, GT 95
7 FICO Ranges : <620, 620-659, 660-699, 700-719, 720-739, 740-759, 760+ (No FICOs were excluded)	8 FICO Score Ranges
9 US Census Regions	2 Market Segments : Distressed States FL,NV,CA,AZ,MI), All Others
Number of Combination Segments = 5x2x2x4x7x9 = **5,040**	Number of Combination Segments = 4x4x8x2 = **256**

19.7 Fold Increase In Segmentation

Data And Methodology

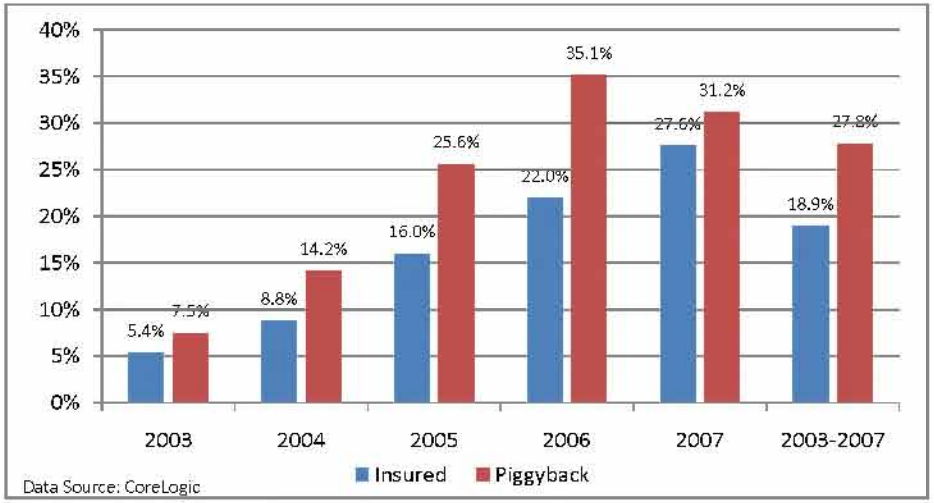
Genworth utilized the servicing data set of Corelogic which has collected highly detailed loan level loan performance information from several large major servicing companies. Piggyback loans are identified as first lien loans with an LTV of 80% and a CLTV greater than 80%. Insured loans are identified by the coding of an insurance provider, whether it be a private mortgage insurer or FHA or VA. Our study focused on loans with CLTV greater than 80%, originated from 2003 through 2007. The sample selected totals 4,917,646 loans of which 3,872,318 are insured high LTV loans, and 1,045,328 are first lien structured or piggyback loans. The overall volume totaled $0.85 trillion

The previous study focused on loans that were currently deliquent 30+ days and loans that had terminated in default. This study takes the analysis much farther. This study reviewed the monthly status of all 4.9 million loans in the sample to see which loans were ever 90 days delinquent, and then follows the monthly status reports until the loan either cures or goes to foreclosure. Consequently, this study evaluates both the performance of the loans and also permits a review of actual cures of previous delinquencies that ultimately resulted in current status for loans still outstanding or successful payoff.

The delinquency rate for the piggyback loans is somewhat understated in that the data set only captures the delinquency rates on first liens. There are likely loans where the 1st lien is still current, but the 2nd lien is delinquent. If these delinquencies were added to the piggyback data, their delincency rate would be even higher than shown and the differential to Insured loans would be even larger.

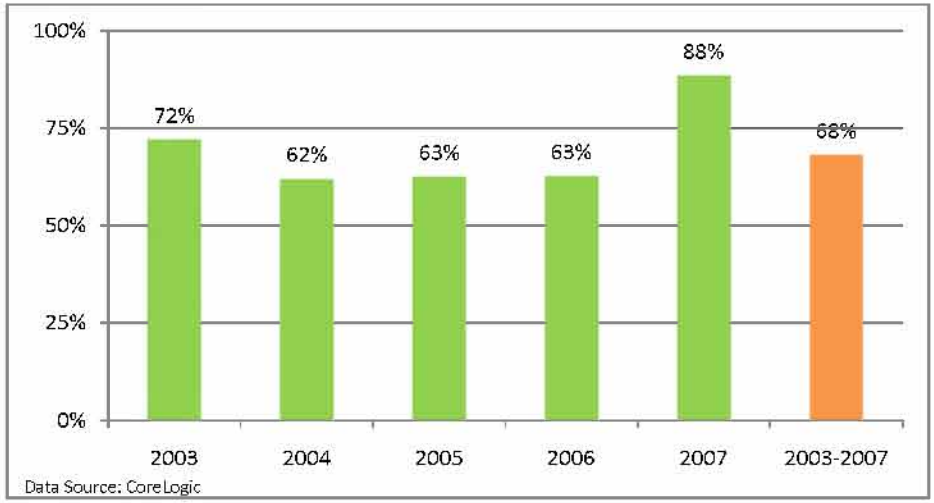
Ever 90 Day Delinquency Rates By Origination Year

Weighting Segments By Piggyback Profile



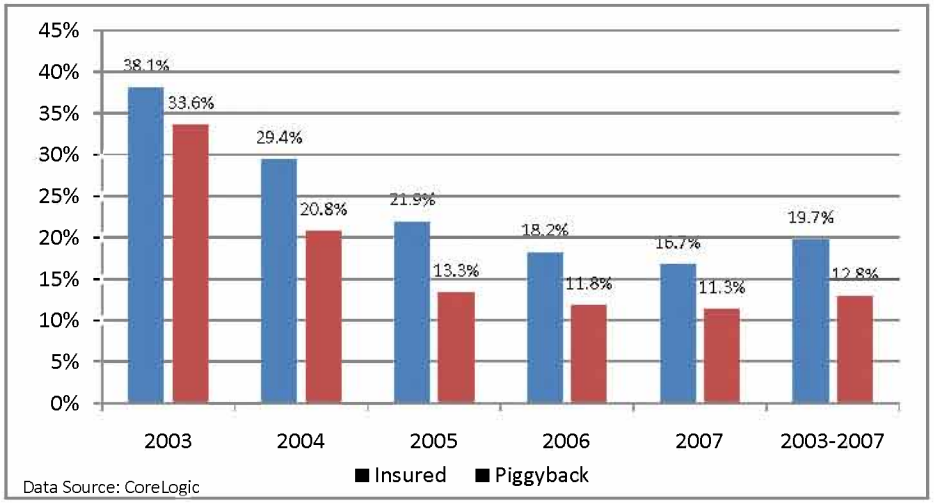
Weighted Ratios Of Piggyback Delq Rates To Insured Delq Rates

Insured Ever 90 Rate / Piggyback Ever 90 Rate



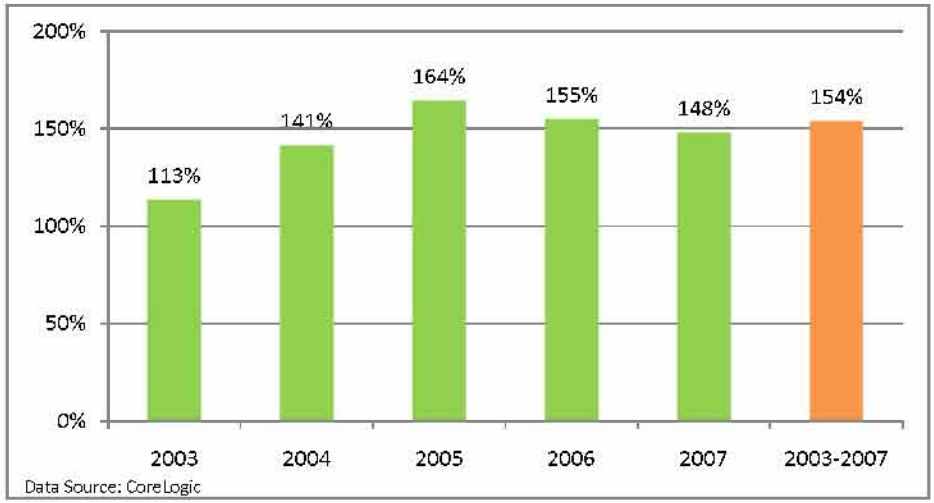
Cure Rates On Ever 90 Day Delinquencies By Origination Year

Weighting Segments By Piggyback Profile



Weighted Ratios Of Insured Cure Rates To Piggybacks

Insured Cure Rate % / Piggyback Cure Rate %

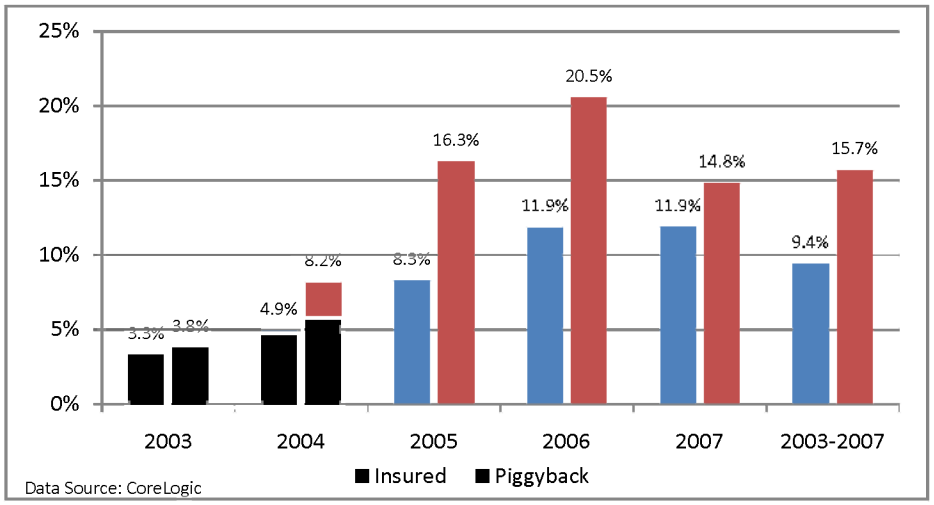


Insured Loans Performed 32% Better than Piggyback Loans

Once Delinquent 90 Days Or More, Insured Loans Exhibited Cure Rates 54% Higher Than Piggybacks

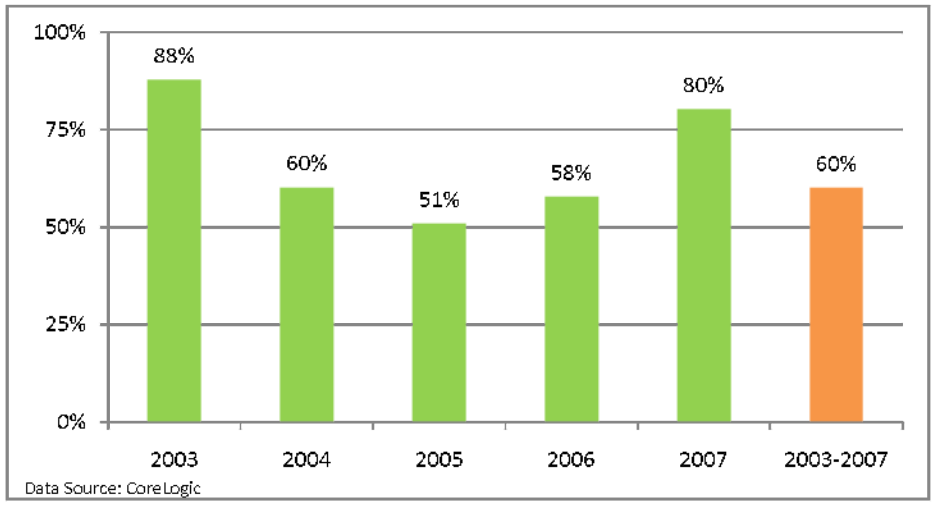
Non-Performing Rates By Origination Year

(Currently 90+ Days Delinquent & Defaults)



Ratios Of Piggyback Non-Performing Rates To Insured

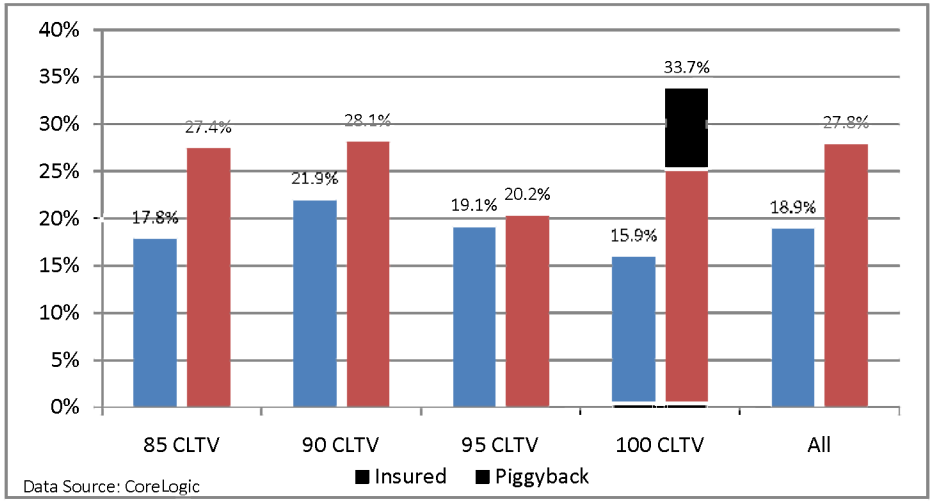
Piggyback Non-Performing Rate / Insured Non-Performing Rate



Lower Ever 90 Delqs Combined with More Cures Result in Insured Loans Having 40% Less Defaults (90+ & F/C)

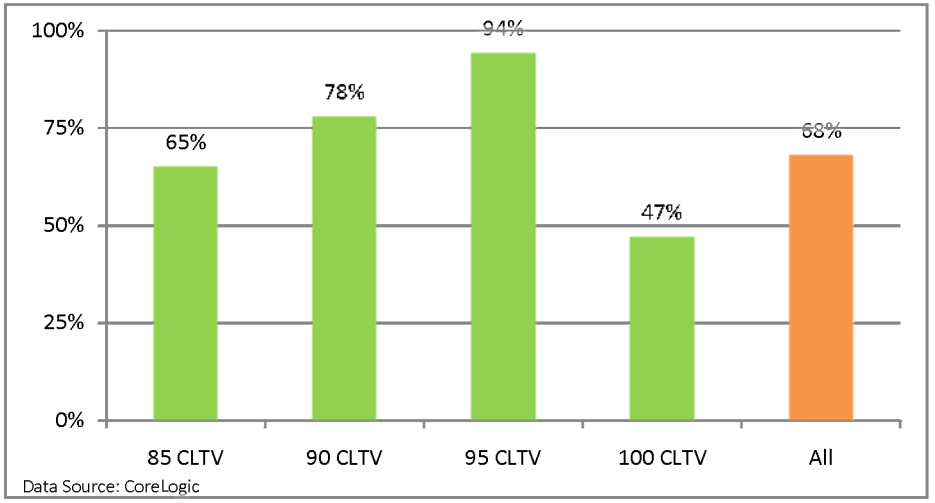
Ever 90 Day+ Delinquency Rates By CLTV

Weighting Segments By Piggyback Profile



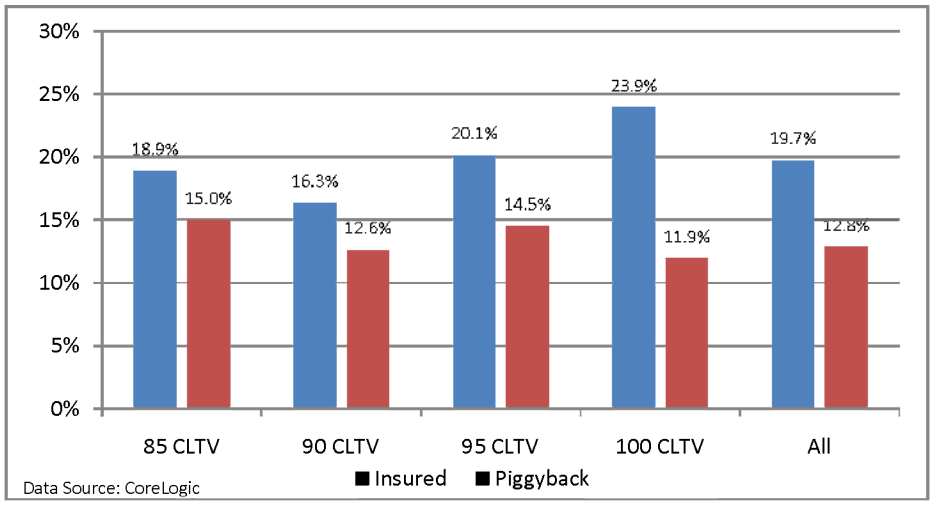
Weighted Ratios Of Piggyback Delq Rates To Insured Delq Rates

Piggyback ETC 90 Rate / nsured ETC 90 Rate



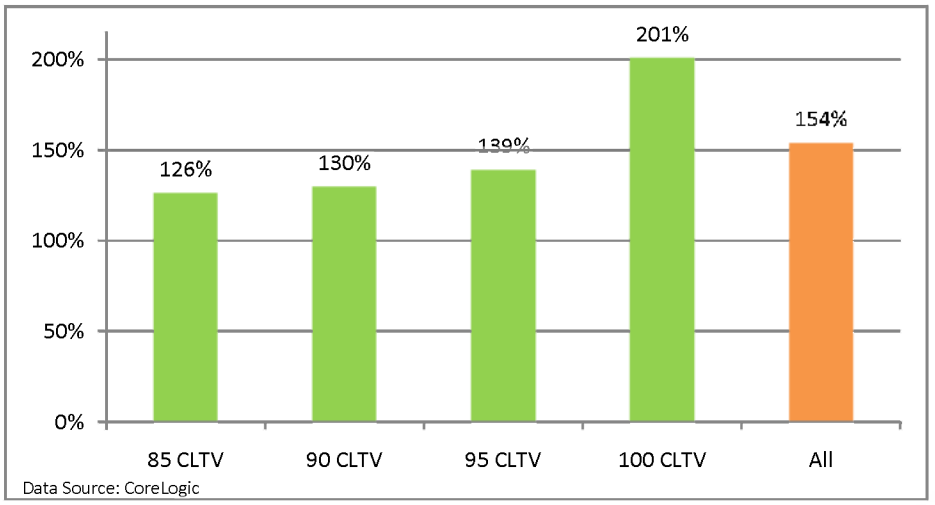
Cure Rates On Ever 90 Day Delinquencies By CLTV

Weighting Segments By Piggyback Profile



Weighted Ratios Of Insured Cure Rates To Piggybacks

Insured Cure Rate / Piggyback Cure Rate

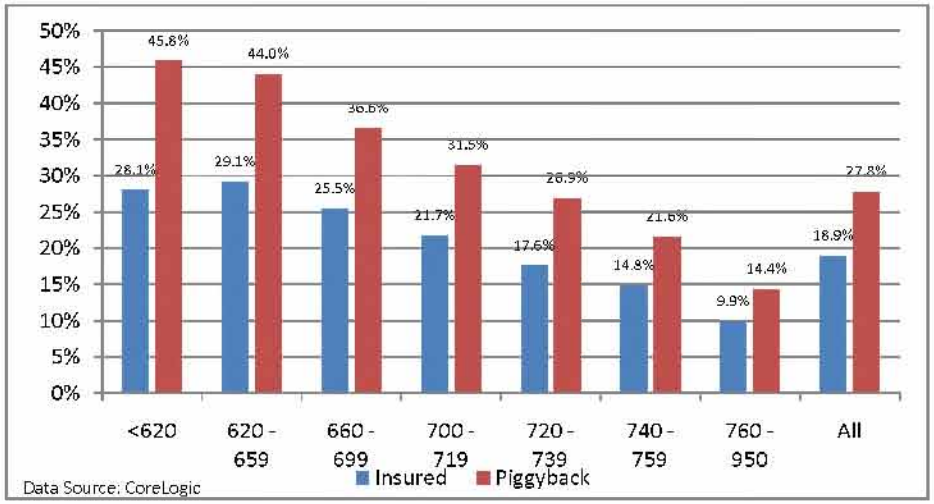


Piggyback 90+ Delinquency Rates Were Significantly Higher For All CLTV Ranges Except For 95 CLTV

Nevertheless, For ALL CLTV Ranges, Including 95 CLTV, Insured Loans Had Significantly Higher Cure Rates

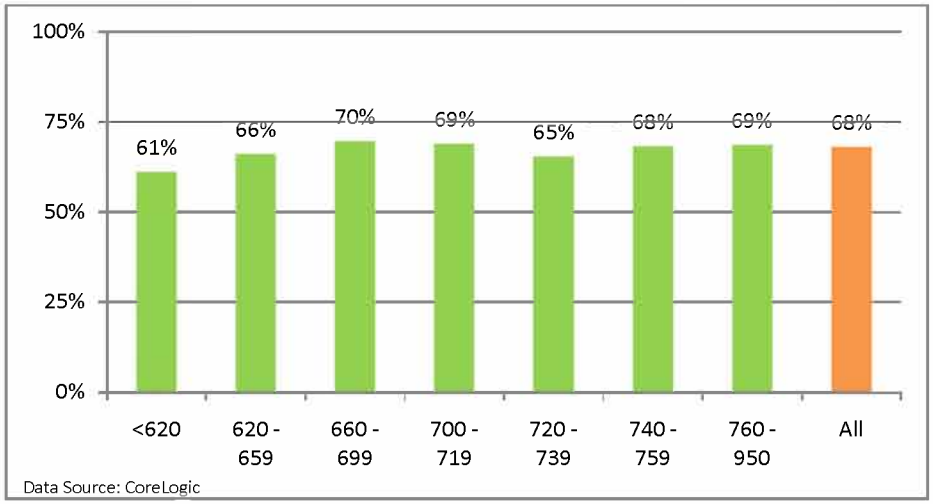
Ever 90+ Delinquency Rates By FICO Score

Weighting Segments By Piggyback Profile



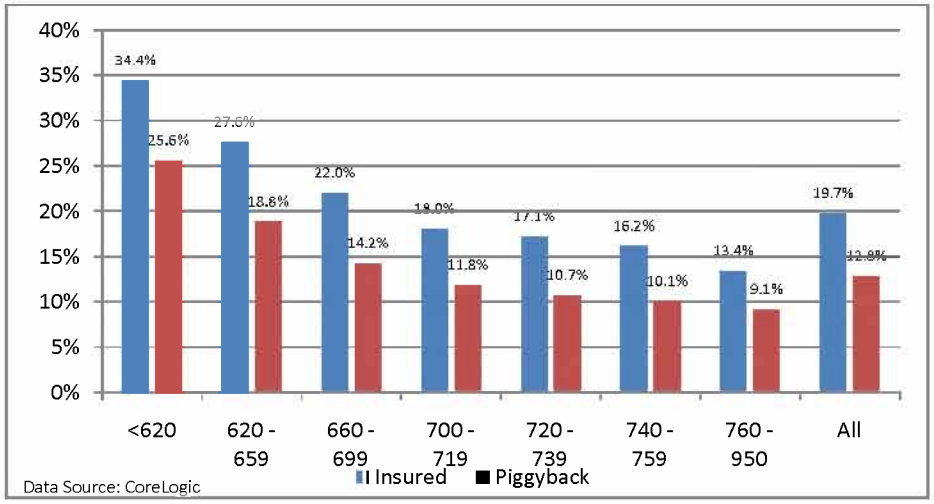
Weighted Ratios Of Piggyback Delq Rates To Insured Delq Rates

Piggyback ETC 90 Rate / nsured ETC 90 Rate



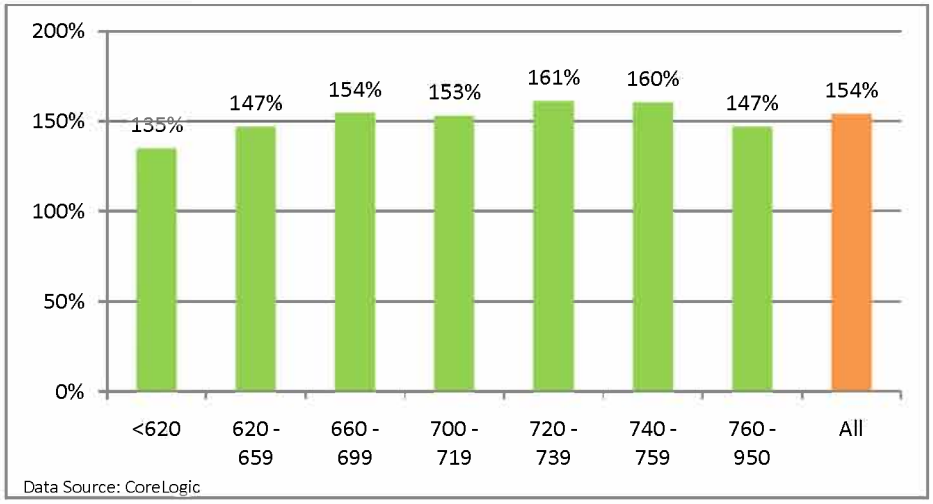
Cure Rates On Ever 90 Day Delquencies BY FICO Range

Weighting Segments By Piggyback Profile



Weighted Ratios Of Insured Cure Rates To Piggybacks

Insured Cure Rate / Piggyback Cure Rate

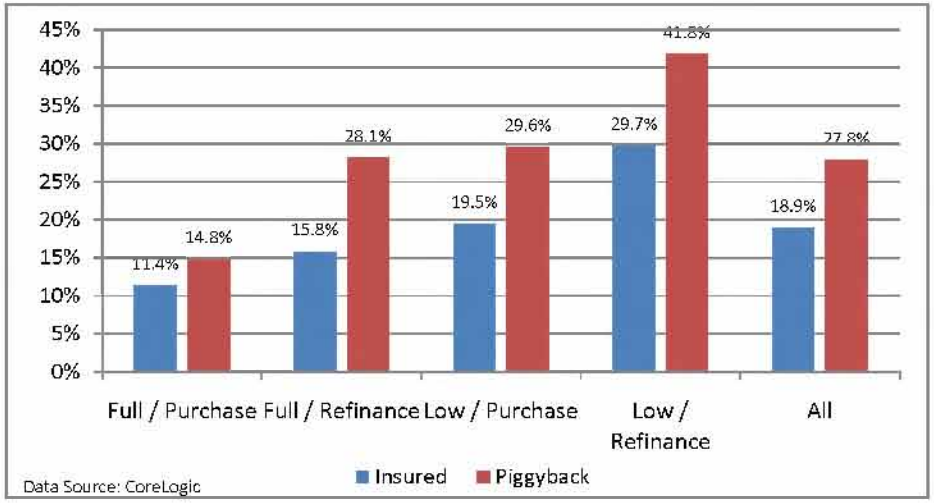


Piggyback Performance Decidely Worse in Virtually All FICO Ranges

Cure Rates On Insured Loans Solidly Higher By 35% or More Depending On the FICO Range

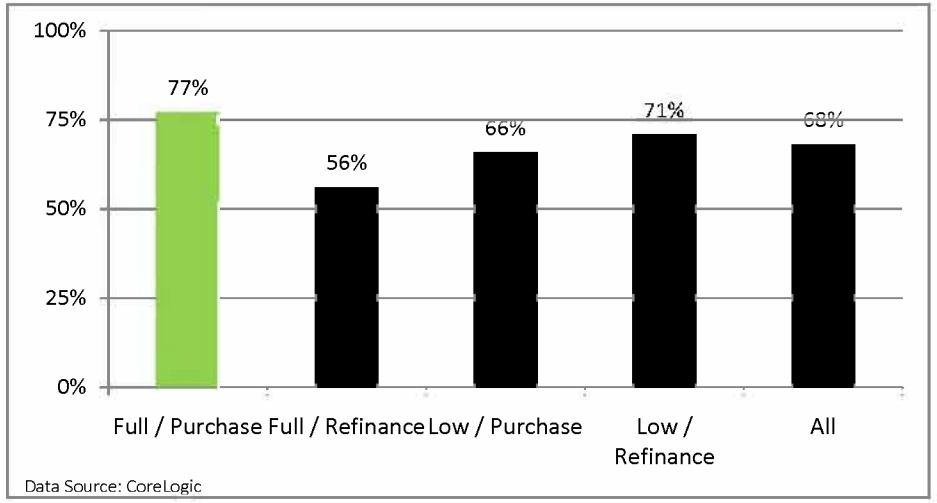
Ever 90+ Delinquency Rates By Doc Type/Loan Purpose

Weighting Segments By Piggyback Profile



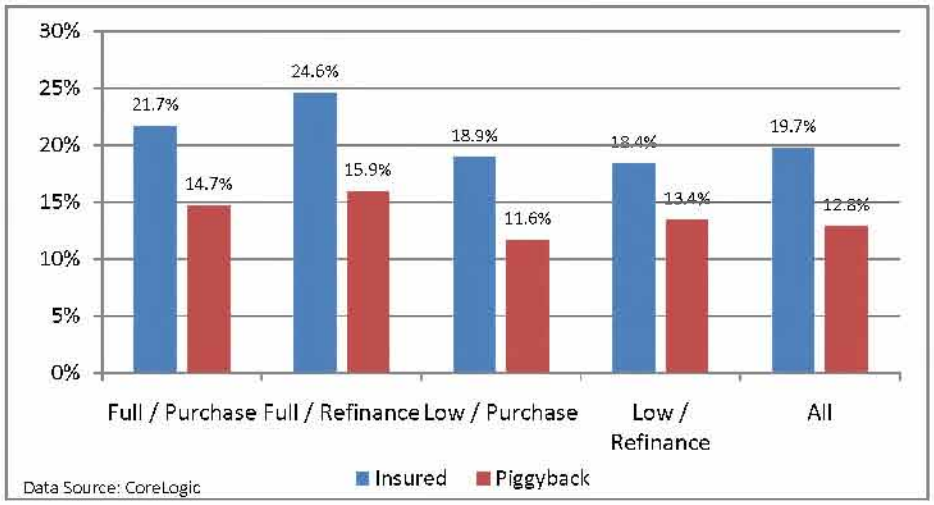
Weighted Ratios Of Piggyback Delq Rates To Insured Delq Rates

Piggyback ETC 90 Rate / nsured ETC 90 Rate



Cure Rates On Ever 90 Day Delqs By Doc Type/Loan Purpose

Weighting Segments By Piggyback Profile



Weighted Ratios Of Insured Cure Rates To Piggybacks

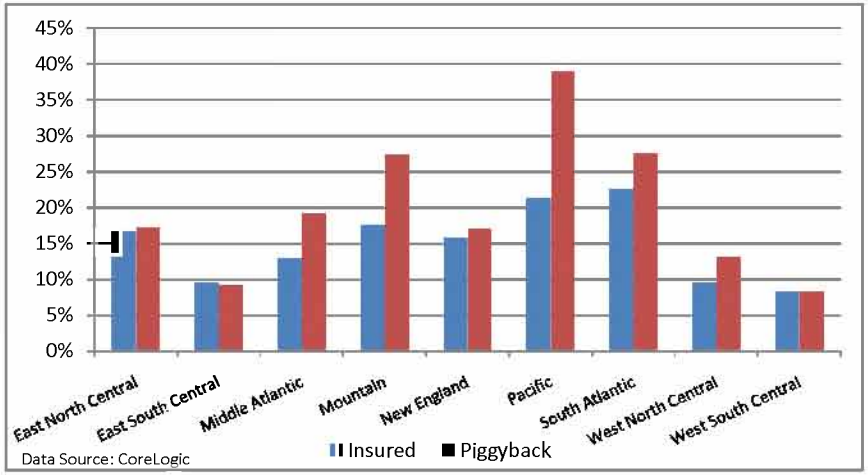
Insured Cure Rate / Piggyback Cure Rate

Evaluation by Documenation & Loan Purpose Shows Insured Loans Clearly Outperform Piggybacks In Each of Segment Roll Ups

Insured Loan Cure Rates Were Substantially Higher in All Of These Roll -Up Combinations

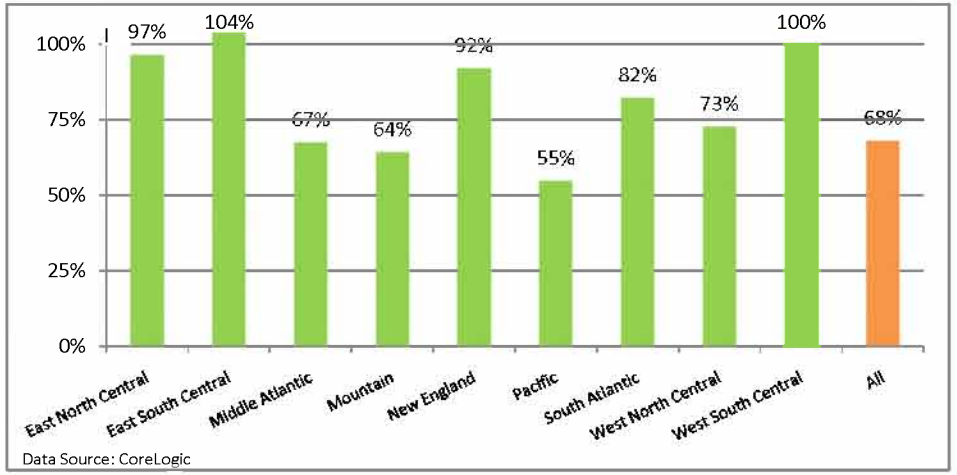
Ever 90 Day Delinquent Rates By US Census Region

Weighting Segments By Piggyback Profile



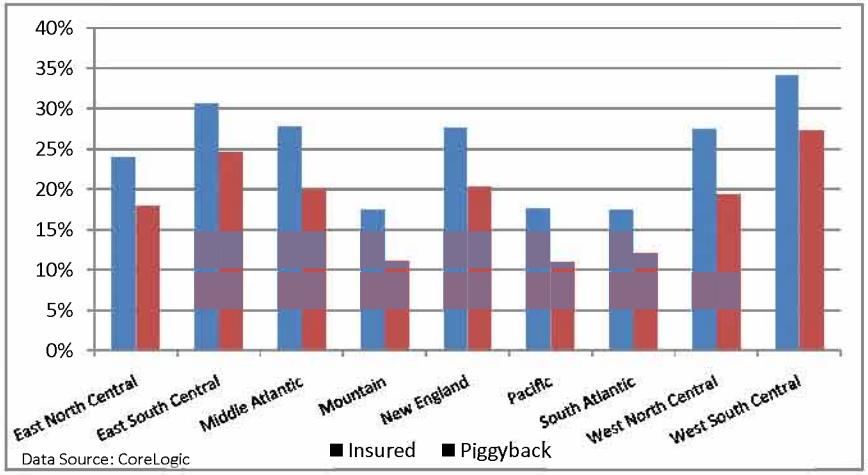
Weighted Ratios Of Piggyback Delq Rates To Insured Delq Rates

Piggyback ETD 90 Rate / Insured ETD 90 Rate



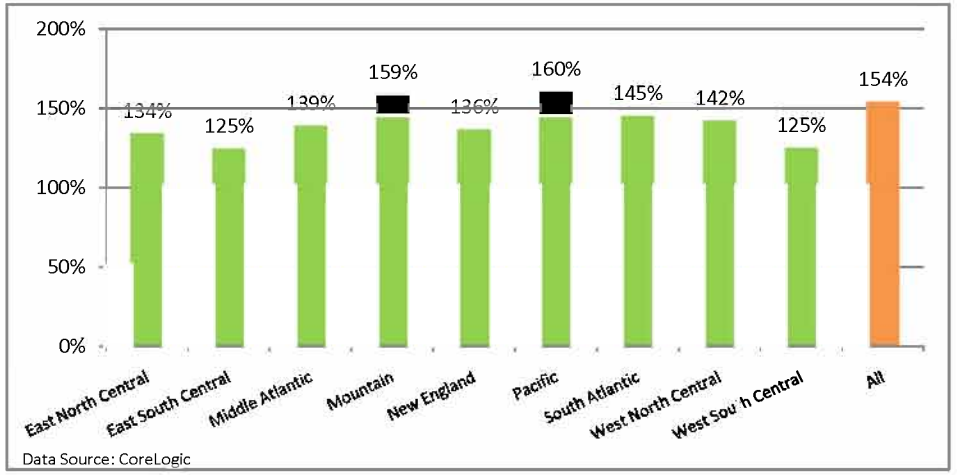
Cure Rates On Ever 90 Day Delqs By US Census Region

Weighting Segments By Piggyback Profile



Weighted Ratios Of Insured Cure Rates To Piggybacks

Insured Cure Rate / Piggyback Cure Rate



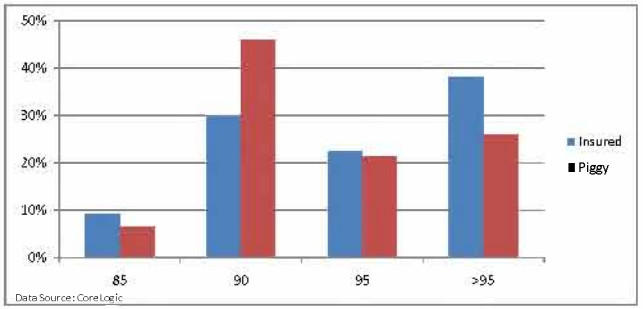
While Ever 90 Delinquent Performance Differences Were Not Uniform Across All Regions,

Such Differences Were Highest In Worse Performing Regions

Cure Rates On Insured Loans Remained Significantly Higher Across All US Census Regions

Appendix - Differences In Distributions Across Key Metrics

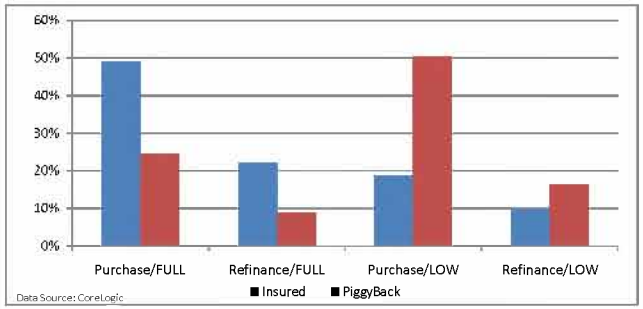
Distribution By CLTV



PiggyBacks Had Proportionately More 90 CLTV And Less 85 CLTV

Insured Had Proportionately More >95 CLTV

Distributions BY Loan Purpose & Doc Type



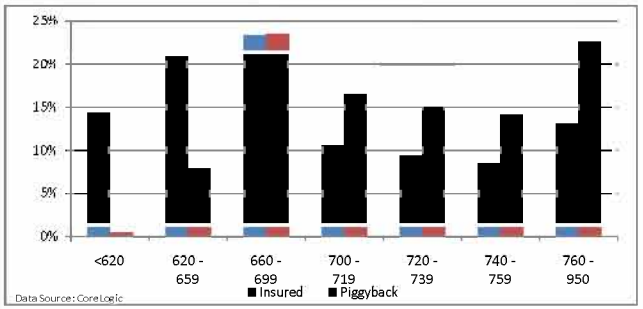
PiggyBacks Had A Higher Percentage Of Purchase Loans

(74.9% vs 67.9% for Insured)

But Also A Higher Percentage Of Low or NO Documentation

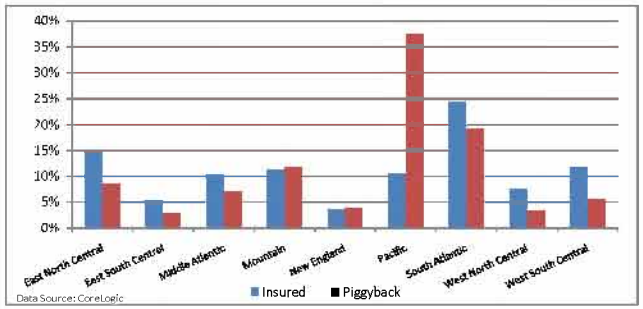
(66.7% Vs 28.6% for Insured)

Distributions By FICO Range



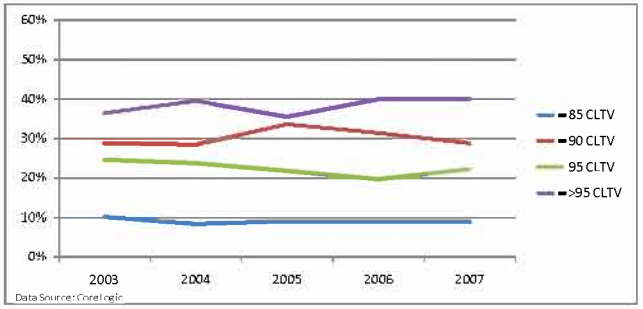
Piggyback Loans Had Higher Average FICO Scores

Distributions By US Census Region



Piggybacks Highly Concentrated In Pacific Region

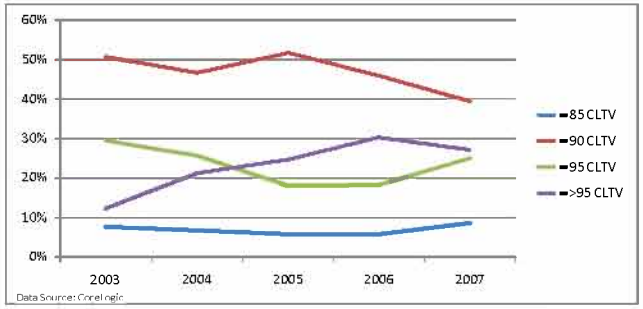
Insured Loan Distributions By CLTV BY Origination Year



Insured Loans Maintained Relatively Higher Risk Profile Throughout

Pricing For Risk By LTV Range Remained Constant

Piggyback Loan Distributions By CLTV By Origination Year

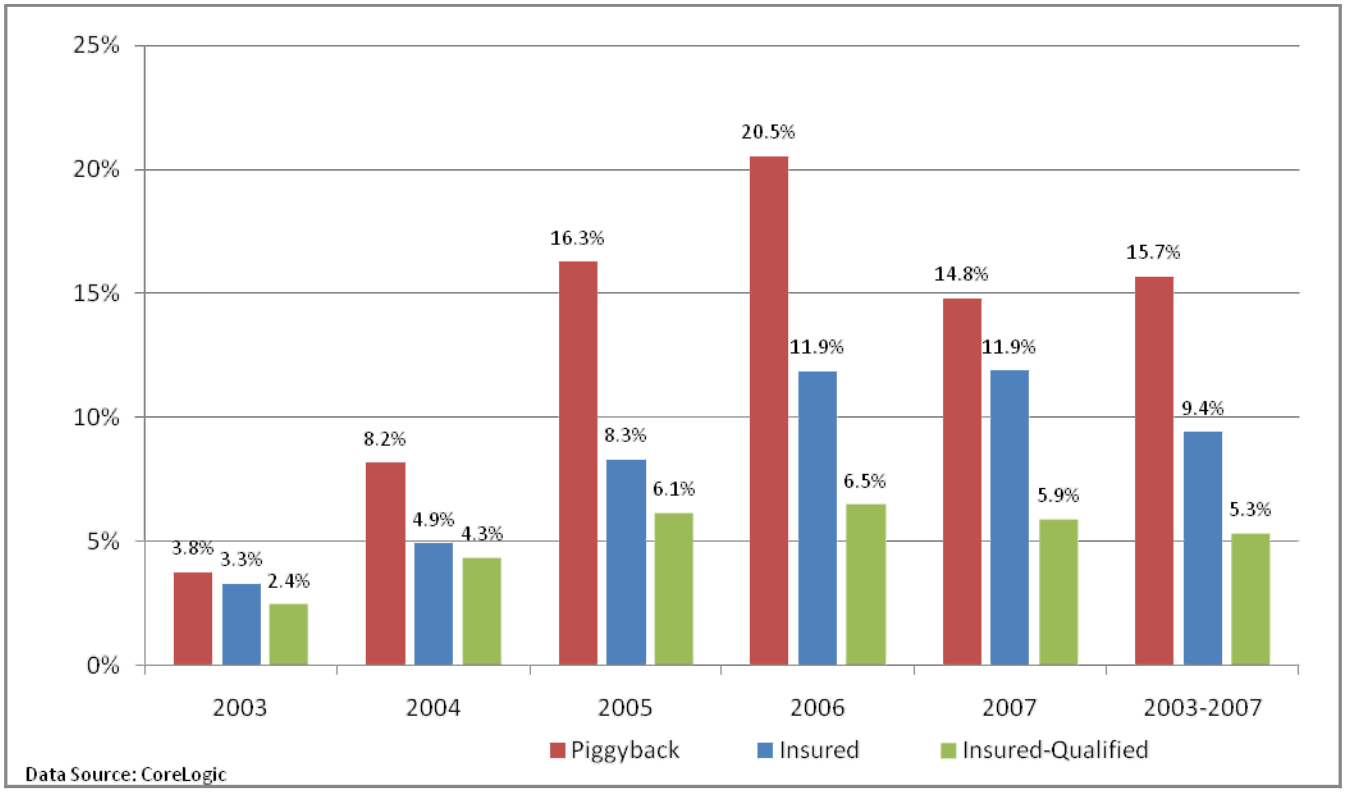


Piggybacks In Earlier Years Had Lower Risk CLTV Profile

Increasingly Riskier Profile Through 2007

Qualified Insured Loan Performance

NON-PERFORMING RATES*



"Qualified" Insured Loans Have Performed Well Through the Downturn

* Non-Performing Rate: (# Loans Currently 90 or more days delinquent + loans that terminated in default) / original number of loans

Assessing the Delinquency and Default Risk of Insured and Non-Insured High LTV Mortgages

July 15, 2011

Table of Contents

Executive Summary

During the recent housing bubble, many borrowers who lacked a 20% down payment used second mortgages (so-called piggyback loans) as a way of avoiding private mortgage insurance on a first lien with a higher than 80% loan-to-value ratio. In a typical "piggyback" transaction, a borrower would take out a first mortgage for 80% of the home's value, a second for 10%, and make a 10% down payment.

First mortgages with a piggyback second were the most prevalent alternative to the use of mortgage insurance over the past decade. At the request of Genworth Financial, Promontory Financial Group conducted an independent study to assess the relative default performance of piggyback and insured loans. For this study, Promontory analyzed the loan-level details on a sample of 5.6 million mortgages originated from 2003 to 2007. The dataset, provided by First American CoreLogic, included several borrower and loan-level characteristics. Serious delinquency was evaluated using a definition corresponding to a loan having ever been 90 or more days past due (or worse) at any given time.

Using this measure, 29.09% of the non-insured, piggyback loans were ever delinquent, compared to 19.44% of insured loans. For the 2007 origination year, the rates were 34.80% and 27.75%, respectively. For each of the provided loan-level variables, insured loans were found to have lower ever delinquent rates. For example, insured loans with a combined LTV of 95 to 100% had a delinquency rate of 21.97%, compared to 33.47% for non-insured, piggyback loans. Similarly, insured loans with FICO scores below 620 had a delinquency rate of 34.56%, well below the 50.05% rate for non-insured loans. Low-doc insured loans had a delinquency rate of 24.70%, compared to 33.67% for non-insured loans.

Because the rich dataset included loan-level, monthly performance indicators, it was possible to study not only the presence of delinquency, but the timing as well. Using a widely known statistical technique known as survival analysis, Promontory assessed the relative performance of insured and non-insured, piggyback loans over time, while simultaneously controlling for loan characteristics that are indicators of the risk of delinquency, including documentation level, loan purpose, owner-occupied status, combined LTV, and FICO score. In its analysis, Promontory also included several time-varying factors including local unemployment rates, market interest rates, and home price indices, all of which helped to significantly explain borrower propensities to default. After controlling for this wide variety of factors, Promontory still found that MI was associated with lower default rates for both fixed rate and adjustable rate first mortgages. Overall, across both fixed and adjustable rate loans, the proportion of non-insured loans surviving to 72 months was .798, compared to .833 for insured loans. Significantly, this difference implies that the baseline cumulative default rate of non-insured loans is 20.98% percent higher than that of insured loans.

Promontory's approach can quantify the extent to which MI serves as a proxy for unobserved aspects of the mortgage underwriting process, which when implemented serve to lower default risk for observed combinations of borrower and loan characteristics. However, the survival analysis regression methodology does not measure the impact that MI-related underwriting may have on adjusting the factors which are controlled for in the study, such as LTV. Any impact that MI may have on mitigating the risk associated with such factors is likely to be embedded in the model covariates, and would not be reflected in the estimated baseline performance differences between insured and non-insured loans.

Questions or comments relating to this study should be directed to C. Erik Larson, PhD, Director, Promontory Financial Group, email: elarson@promontory.com, phone: 202-384-1200.

1. Introduction

This study presents the results obtained by Promontory Financial Group in its review and assessment of the performance of mortgage loans originated with a second "piggyback" lien compared to first-lien MI-insured mortgage loans originated in the years 2003 to 2007.

Section 1 begins by illustrating the performance differences though descriptive tabular analysis of severe (ever 90 days-past-due) delinquency rates and through graphical comparison of vintage cumulative delinquency curves. A conclusion from the tabular and vintage curve analysis is that it will be important to control simultaneously for a potentially large number of risk factors, and to do so in a way that is sensitive to the time-varying impact that such factors may have over the life of the mortgage. An appropriate framework by which to control for such effects in a time-sensitive manner will require a relatively sophisticated modeling approach, that of statistical survival analysis.

Section 2 discusses the need to employ survival analysis in order to control for the presence of "censored" observations in the mortgage data. In the present context, censored observations correspond to the measured time-to-default of those accounts which have not defaulted and remain open at the end of a study period. For a censored observation, it is only known that the actual time to default or payoff will exceed the observed value. Since longer-lived accounts are more likely to be censored, analysis based solely on non-censored observations is likely to result in biased statistical estimates. Note that there are two "events" which may end a mortgage account lifetime: the first is default; the second is payoff. Since either of these two events may impact the probability of observing the other, we consider a "competing risks" survival analysis, though we continue to focus on the risk of extreme delinquency (i.e., default).

Section 3 presents the results from estimation from both simple and extended versions of MI-stratified Cox proportional hazards models, estimated by mortgage interest rate type (fixed rate and adjustable rate). Risk factor parameter estimates are generally in line with expectations as to sign. We also compare the implied baseline survival curves from the estimated models to smoothed Kaplan-Meier estimates of the empirical survival function. Our modeling approach allows us to produce separate baseline survival estimates for insured and non-insured (with piggyback) mortgages. These baseline curves have been controlled for the impact of risk factors on performance in a way that cannot accomplished by simple tabular or graphical analysis of empirical data. Overall, our analysis is supporting of the assertion that the historical performance of first lien MI-insured loans has been associated with lower rates of extreme delinquency or default, when compared to non-insured first lien loans accompanied by a piggyback second lien, and when controlling for various risk factors.

Section 4 concludes.

2. Mortgage Performance Data

The data obtained by Promontory for this study contain performance information for 5,676,428 individual residential mortgages. The data were provided by Genworth Financial in 2011, who obtained them from First American CoreLogic's servicing database.

There are a number of reasons why the loans in the Genworth-provided dataset might not mirror those in the population as a whole.

- First, and most importantly, both the current and original Genworth study focus exclusively on loans with <20% down payment (>80% Loan-to-Value), which is only a portion of the first-lien origination market. Loans with LTV in excess of 80% represent approximately 20% of the overall market.
- Second, the CoreLogic database does not cover 100% of the loan market, as not all servicers are CoreLogic customers. Their coverage over the study period is over 60% of loans originated. This fact reduces both the number of piggyback and insured loans in the Genworth dataset, relative to the population. However, the missing servicers during the study period were mainly large diversified national-level players, and there is no reason to think that their omission should have a systematic selectivity bias on the representativeness of mortgage types in our dataset.
- Third, CLTV is not reported on 100% of loans in the CoreLogic dataset. Genworth's definition of a "loan with a piggyback" is a first lien loan with LTV=80 and with reported CLTV >80. This definition serves to reduce the number of piggybacks potentially included in the study, while not reducing insured loans.
- Finally, certain exclusions had already been applied to the dataset before Promontory received it. These included excluding records with missing FICO at origination.

To limit and ensure the comparability of our analysis, Promontory further excluded loans with:

- Missing region;
- Combined loan-to-value (CLTV) greater than 105%;
- Categorization of 'Non Insured, Sold'; and
- A mismatch between the origination date in the dataset and the origination date as calculated from the performance history.

Of the records provided by Genworth, 5,492,097 were used in the benchmarking and vintage curve analysis described below.

a. Descriptive Statistics

This section presents summary tabular analyses illustrating how insured vs. non-insured (with piggyback) mortgage performance differs with various risk factors that are typically thought to be indicative of borrower or product risk.

Promontory used the performance definition of "ever 90 days past due or worse" (including foreclosure and "real estate owned"), a loan-level variable calculated by Genworth and provided on the analysis dataset. This variable is a measure of severe delinquency and is closely related to the definition of default used by most servicers.

Table 1 presents the lifetime cumulative delinquency rates corresponding to our performance definition (ever 90 days past due or worse). In all years except for 2003, the calculated piggyback delinquency rates are higher than the insured delinquency rates. The overall bad rate on the analysis dataset was 19.44% for insured loans and 29.09% for piggyback loans.

Table 1: Delinquency Rates by Origination Year

Origination Year	2003	2004	2005	2006	2007	2003-2007
Insured	12.10%	16.15%	20.49%	24.34%	27.75%	19.44%
Non-Insured with Piggback	9.40%	16.18%	27.47%	36.73%	34.80%	29.09%

Table 2 illustrates how delinquency rates increase with Combined Loan-to-Value (CLTV). For the insured mortgages, the CLTV value is the same as the LTV of the first lien; for non-insured mortgages, the CLTV represents the combined LTV of both the first and second (piggyback) liens.

Table 2: Delinquency Rates by CLTV

Combined LTV at Origination	80-85	85-90	90-95	95-100
Insured	16.14%	17.29%	17.57%	21.97%
Non-Insured with Piggback	30.90%	29.77%	21.80%	33.47%

As expected, increasing FICO scores are associated with lower delinquency rates, with piggyback loans having higher delinquency rates in all FICO score bands, as documented in Table 3.

Table 3: Delinquency Rates by FICO Score

Origination FICO	350-619	620-659	660-699	700-719	720-739	740-759	760+
Insured	34.56%	24.29%	18.53%	15.25%	12.47%	9.90%	7.04%
Non-Insured with Piggback	50.05%	46.35%	37.34%	32.83%	28.11%	22.74%	15.77%

Table 4 shows little difference in severe delinquency rates between purchase and refinance purposes for insured loans, while non-insured (with piggyback) loans supporting refinance are significantly riskier than loans supporting a new purchase. These patterns run against the traditional thinking that a loan supporting a new purchase is riskier than one supporting a refinance; however one may need to control for other factors to see the expected relationship in these data.

Table 4: Delinquency by Loan Purpose

Loan Purpose	Purchase	Refinance
Insured	19.76%	18.66%
Non-Insured with Piggyback	26.42%	38.00%

Table 5 illustrates that low documentation loans are more risky than full-documentation loans for both insured and non-insured loans.

Table 5: Delinquency by Documentation Level

Documentation Level	Full	Low
Insured	17.56%	24.70%
Non-Insured with Piggyback	21.07%	33.67%

And finally, Table 6 illustrates the dramatically lower delinquency rates for adjustable rate mortgages that are insured, compared to those that are non-insured. The difference is much smaller for fixed rate loans.

Table 6: Delinquency by Rate Type

Rate Type	Fixed Rate	Adjustable Rate
Insured	19.33%	22.45%
Non-Insured with Piggyback	20.15%	41.96%

b. Vintage Curves

Vintage curves provide powerful summaries of the performance of insured and piggyback loans. To construct our vintage curves, we plot the cumulative monthly severe delinquency rate over time for loans originated in a given year. For each vintage, we present curves for sub-segments of insured and piggyback loans. We segment using origination FICO (<=620 is SubPrime, >620 Prime) and CLTV (less than or equal to 90% and greater than 90%). The early vintages (2003 through 2005) have 72 months of performance. Vintages 2006 and 2007 have 60 and 48 months of performance, respectively. As shown in Figures 1 and 2, below, for the 2007 vintage, piggyback loans have significantly accelerated and higher lifetime cumulative delinquency. Appendix A presents additional curves.

Figure 1
Cumulative Bad Rates for 2007 Vintage and CLTV LE90

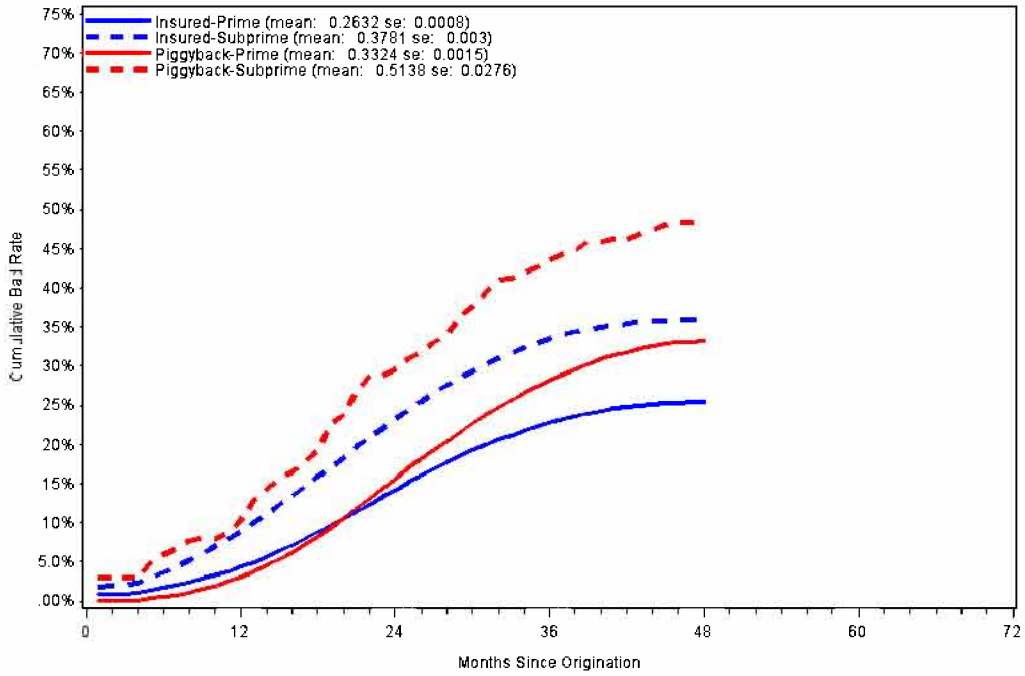
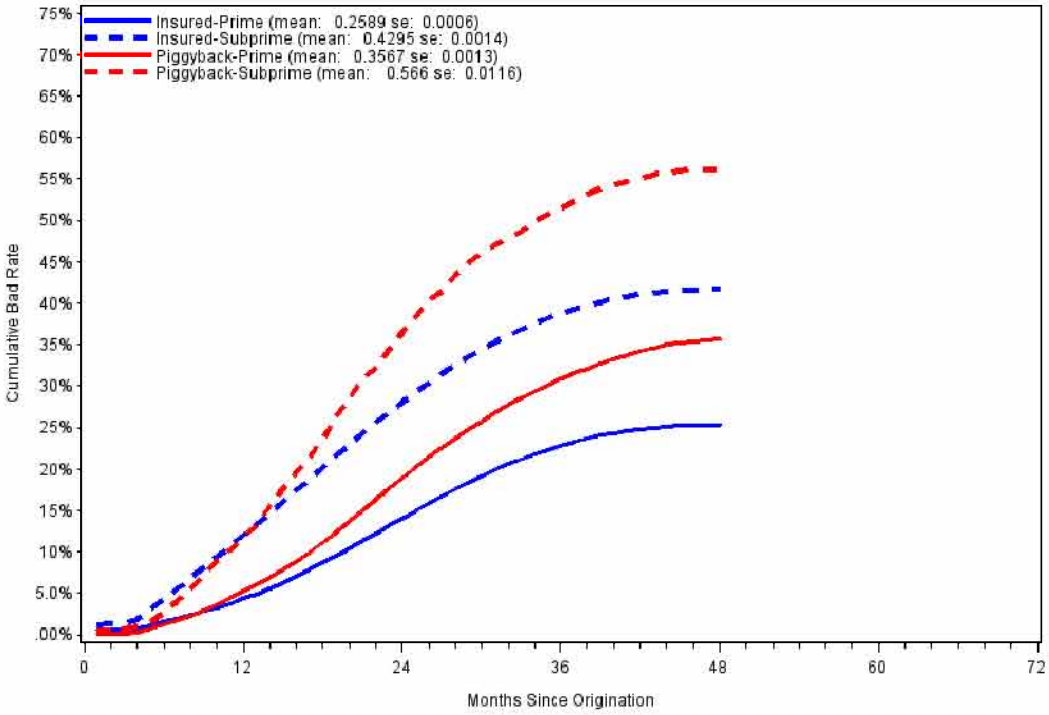


Figure 2
Cumulative Bad Rates for 2007 Vintage and CLTV GT90



The tabular analysis and the vintage curve analysis are both strongly suggestive of differing performance characteristics for insured and non-insured (with piggyback) mortgages. However, it is undoubtedly the case that other risk factors, whose level and impact may differ for insured and non-insured (with piggyback) groups, should be controlled for before any conclusions are drawn or stylized facts established.

For instance, while the vintage curves generally illustrate that non-insured loans with piggyback seconds may have cumulative long-term delinquency rates that are higher than their insured counterparts, the vintage curves do at times cross, with insured loan cumulative severe delinquency rates often being greater during the first 12, and in some instances, first 48 months. This occurs even with vintage curves that attempt to control – albeit weakly -- for factors such as origination FICO and CLTV. One potential explanation for this reversal in risk is that differences in payments between the two mortgage types may significantly impact the observed delinquency. In our dataset, and in the population, insured mortgages overwhelmingly have fixed-rate payment structures, while non-insured (with piggyback) mortgages are almost evenly split between fixed- rate and adjustable-rate payment structures. Since initial rate levels of adjustable-rates loans are usually significantly below those carrying a fixed-rate, and because they remain so for months or years before any ARM reset, the initial payments for the fixed rate loans are likely to be significantly higher than the adjustable rate loans. Consequently, it would not be surprising if the higher initial payments of fixed rate mortgages (controlling for CLTV) were associated with an initial higher risk of delinquency for insured, predominantly fixed rate, mortgages.

An obvious takeaway is that it will be important to control simultaneously for a potentially large number of risk factors, and to do so in a way that is sensitive to the time varying impact that such factors may have over the life of the mortgage. Our dataset will allow us to control for such effects, but an appropriate framework in though which to control for such effects in a time-sensitive manner will require a relatively sophisticated modeling approach.

3. Survival Models and Analysis

The statistical methods of survival analysis (also called life-table analysis or failure-time analysis) have been developed to analyze the time-to-occurrence of an event as well as the fact of its occurrence. For example, survival analysis has been employed to study the time-to-failure of machine components, time-to-death of patients in a clinical trial, and the duration of unemployment spells of workers.

Introductions to the statistical literature on survival analysis may be found in texts by Kalbfleisch and Prentice (1980), Lawless (1982) and Cox and Oakes (1984). Here, we use survival analysis to model the "lifetimes" of mortgages. Note that there are two "events" which may end a mortgage account lifetime: the first is default, which we have been studying above; the second is payoff. Since either of these two events may impact the probability of observing the other, we consider a "competing risks" survival analysis.

A common feature of survival data is the presence of censored observations. In the present context, censored observations correspond to the measured time-to-default of those accounts which have not defaulted and remain open at the end of a study period. For a censored observation, it is only known that the actual time to default or payoff will exceed the observed value. The study of survival data

typically employs information from both censored and non-censored observations. Since longer-lived accounts are more likely to be censored, survival analysis based solely on non-censored observations is likely to result in biased statistical estimates. Indeed, simple regression analysis of account bad-rates which fails to take account for the impact of censoring is likely to produce biased estimates of the explanatory variables if the censoring is not random or if the mixture of effects is not distributed randomly across censored and uncensored accounts.

a. Survival and Related Functions

Suppose the population under study consists of mortgage lifetimes for N relatively homogeneous accounts. Each lifetime in the population can be represented by a random variable, T_i, where i=1,...,N. If n account lifetimes are to be randomly sampled from the target population, each account will have a potential censoring time (or censoring age) a_i (i=1,...,n). The potential censoring time is determined using the opening date for the account and the closing date for the period during which observations are collected. The sample data consists of n pairs (c_i,s_i), where $s_i=\min(T_i,a_i)$ is the observed lifetime of account i, and c_i is an indicator variable taking the values $c_i=1$ if $T_i<a_i$ (s_i is an uncensored observation) and $c_i=0$ if $T_i>a_i$ (s_i is a censored observation).

For the moment, ignore the possibility of censoring. Distributional characteristics of a population of random account lifetimes T_i are summarized by a distribution function, F(t), and survival function, S(t), here defined as

$$F(t) = 1 - S(t) = Probability(T_i < t).$$

F(t) and S(t) are both defined for $0<t<\infty$. Using statistical survival analysis, one can use sample data to make reliable inferences about these population functions.

Note that F(t) reports the proportion of accounts in the population with lifetimes less than t, while S(t), reports the proportion of accounts with lifetimes greater than or equal to t. Also, as t increases from zero, F(t) monotonically increases from zero toward one, while S(t) monotonically decreases from one toward zero.

Closely related to the distribution function, F(t), is the density function, f(t). When t is measured in continuous units, f(t) is defined by

$$f(t) = \partial F(t)/\partial t.$$

The density function can be thought of as the instantaneous probability of the account lifetime ending at t.

The hazard function or age-specific failure rate function, h(t), is related to the distribution, survival and density functions. The hazard function is defined by

$$h(t) = f(t)/S(t).$$

The hazard, h(t), may be interpreted as the "instantaneous" conditional probability that an account will close at age t, given that it has remained open to at least age t. Hazard functions are particularly useful in the analysis of account lifetimes, since they specify the risk of immediate closure of an open account

at age t. The choice of an appropriate statistical model for account lifetimes is aided by the careful study of empirical hazard functions constructed from sample data.

The distribution, survival, density and hazard functions are mathematically equivalent representations of the distributional characteristics of a population of account lifetimes, since each one of them can be derived given any of the others.

b. Cox Proportional Hazard Models

As part of this study, Promontory estimated a Cox Proportional Hazard (PH) Model to investigate and quantify the relative performance of piggyback and insured loans while controlling for loan-level factors that are commonly thought to be important in describing loan performance. The Cox Proportional Hazard Model is originally due to David Cox (1972). The model has been extended significantly by others (see Therneau and Grambsch (2000)), and has received widespread empirical application. The model is usually written as

$$h_i(t) = \lambda_0(t)\, Exp(\beta_1 X_{i1t} + \beta_2 X_{i2t} + \ldots + \beta_k X_{ikt}).$$

This model specifies that the hazard rate for individual "i" at time "t" is made up from the product of two components: a non-negative "baseline" hazard function $\lambda_0(t)$, and an individual-specific proportionality factor $Exp(\beta_1 X_{i1t} + \beta_2 X_{i2t} + \ldots + \beta_k X_{ikt})$, where $X_{i1t}, X_{i2t}, \ldots, X_{ikt}$ are the values of the observed , possibly time-varying, covariates (hence the indexing of the individual covariates by t.[1]) The corresponding covariate coefficients, $\beta_1, \beta_2, \ldots \beta_k$, are unknown parameters which have to be estimated from the data.

Taking natural logs, the model is also written as:

$$\log h_i(t) = \alpha_0(t) + \beta_1 X_{i1t} + \beta_2 X_{i2t} + \ldots + \beta_k X_{ikt},$$

The Proportional Hazards Model gets its name from the fact that the ratio of hazards for any two individuals is given by the ratio or their proportionality factors. However, there is sometimes a reason to believe that the proportionality assumption underlying the Cox specification might not be warranted, and that it is appropriate to consider extensions of the model for non-proportional hazards. One such extension is through "stratification."

In a stratified model, there is a presumption that the hazards of two (or more) groups of individuals may be written as

$$\log h_i(t) = \alpha_1(t) + \beta_1 X_{i1t} + \beta_2 X_{i2t} + \ldots + \beta_k X_{ikt}, \text{ for individuals } i \text{ that are members of group 1, and}$$

$$\log h_j(t) = \alpha_2(t) + \beta_1 X_{j1t} + \beta_2 X_{j2t} + \ldots + \beta_k X_{jkt}, \text{ for individuals } j \text{ that are members of group 2.}$$

These two specifications can be combined into a single specification for both groups by writing

$$\log h_i(t) = \alpha_c(t) + \beta_1 X_{i1t} + \beta_2 X_{i2t} + \ldots + \beta_k X_{ikt}, \text{ where } \alpha_c(t) = \alpha_1(t) D_{i1} + \alpha_2(t) D_{i2}$$

[1] In order to incorporate time-varying covariates, we utilize a representation of the survival model as a counting process; see Hosmer and Lemeshow (1999), Appendix 2.

where D_{i1} and D_{i2} are zero-one indicator functions identifying an individual's membership in group 1 or 2.

In order to estimate the Cox PH model, methods of partial likelihood maximization are employed (which allows one to avoid specifying the baseline hazard function.)[2] In the case of a stratified model, partial likelihood estimation requires a slightly more complex estimation procedure. Separate partial likelihoods functions are first constructed for each stratification group; these functions are then multiplied together to form an aggregate partial likelihood model that is maximized though numerical estimation of the coefficient vector **β**.

4. Estimation

a. The Survival Analysis Modeling Dataset

Due to the size of the Genworth dataset and the computational demands in terms of memory and time required to estimate the partial likelihood algorithms for the alternative survival models, particularly in the presence of time-varying covariates , Promontory did not find it feasible to estimate the stratified proportional hazard models with the full dataset that had been provided by Genworth. Instead, we have utilized a 10% randomly selected subsample for use as a modeling dataset.[3] This dataset is still very large, containing 538,500 mortgage lifetimes. Summary information is given in the following table.

Table 7: Counts and Dispositions of Observations in the Modeling Dataset

Rate Type	Type	Default	Paid Off	Paying	Total by Rate Type
All Rate Types	Insured	83,641	144,807	203,240	538,500
	Non-insured w/ Piggyback	31,198	33,323	42,291	
Fixed Rate	Insured	73,764	126,260	188,923	452,026
	Non-insured w/ Piggyback	12,774	21,275	29,030	
Adjustable Rate	Insured	9,877	18,547	14,317	86,474
	Non-insured w/ Piggyback	18,424	12,048	13,261	

Appendix B contains additional summary information on loans characteristics in the modeling dataset.

b. Results

Estimation of Nonparametric (Empirical) Survival Curves

Rather than proceeding directly to the estimation of a stratified proportional hazards model, it will be useful to first consider the empirical survival distribution curves for default that are implied by the sample data. To this end, we have constructed smoothed estimates of the empirical survival function using the method of Kaplan and Meier (1958.) Figures 3 and 4 show the empirical, or non-parametric, estimated default survival curves for insured and non-insured (with piggyback) mortgage loans, computed for subsamples defined by whether the loans were of fixed rate or adjustable rate type.

[2] Estimation of Cox Proportional Hazards and other survival models is discussed in Kiefer (1988).

[3] Promontory has obtained similar results with alternative randomly selected samples of a similar size.

These curves, as do all the estimates presented in this section, focus exclusively on the risk of default, and treat the competing risk of payoff as a censoring event. This approach is a conventional and meaningful way to present results for a risk of interest (here, default) when competing risks are present.

Figure 3. Empirical Survival Curve Estimate, Fixed Rate Loans

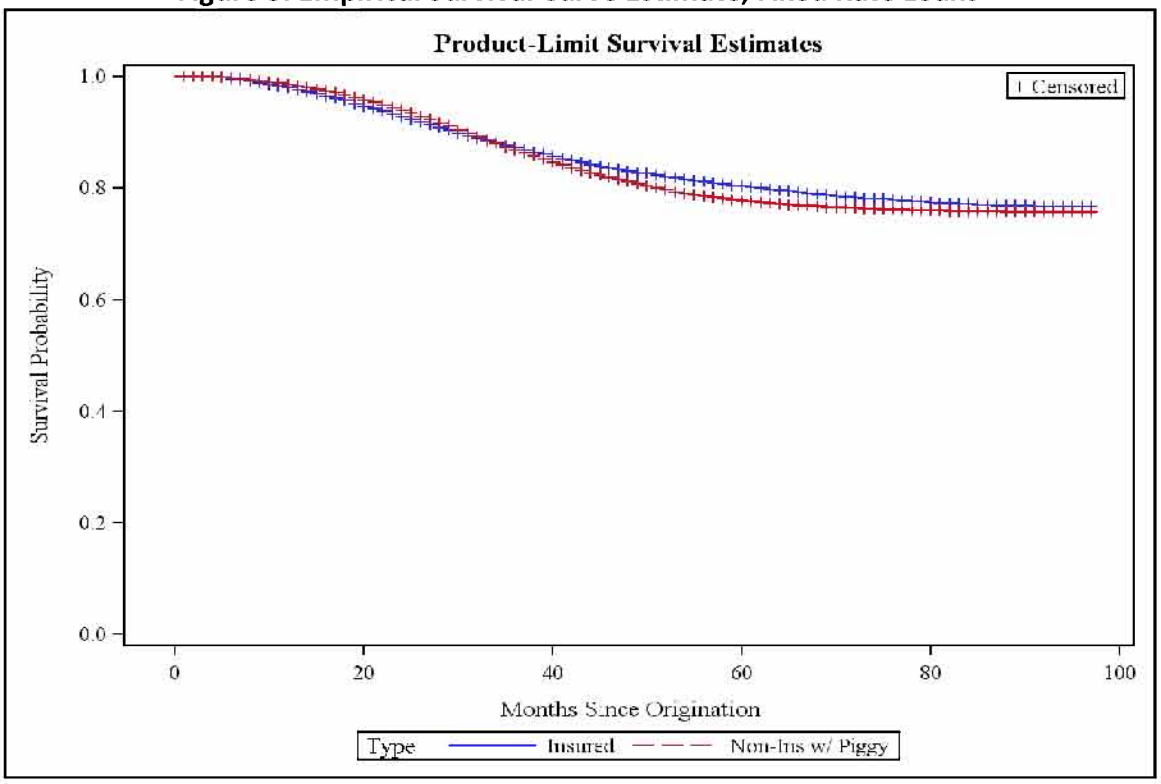
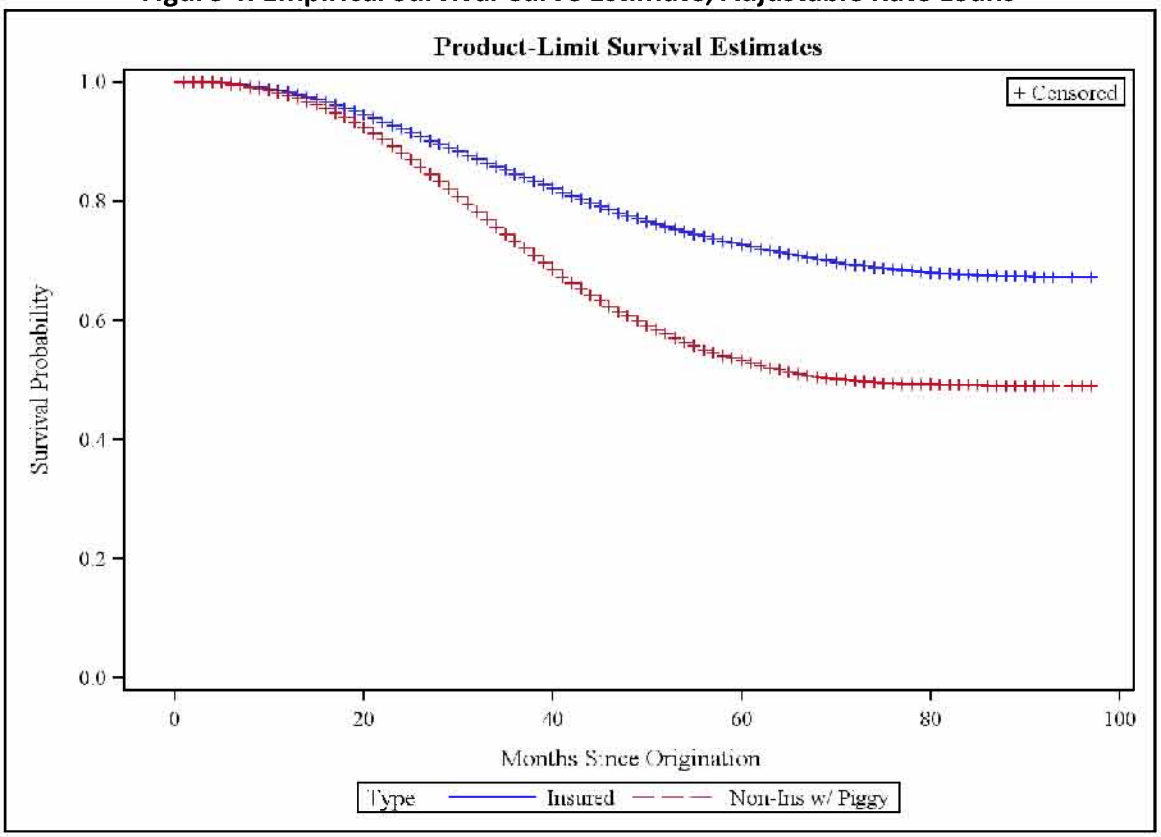


Figure 4. Empirical Survival Curve Estimate, Adjustable Rate Loans



Note that even in the empirical survival curves, the long-term higher default risk associated with non-insured loans having piggyback second liens is easy to identify. This is particularly true for the adjustable rate loans, where the survival proportion for the uninsured mortgages ultimately drops well below that of the insured loans.

Estimation of a Stratified Proportional Hazards Model

We are now ready to turn to the estimation of the stratified Cox proportional hazards model. As suggested earlier, we have chosen to specify a model in which we include additional covariates and in which we estimate separate stratified models for subsets of our sample, with loans grouped by rate type. Part of the rationale for estimating different models for different rate types (fixed vs. adjustable) is that borrower behavior in response to changes in economic conditions is likely to be very different across these products. Furthermore, differences in mortgage product types or borrower underwriting practices may exist that are unobservable in our data, but which may result in different magnitudes of the estimated covariate coefficients or in different baseline hazard and survival estimates.

Covariates

The covariates in our model include several zero-one categorical (or dummy) variables. For each of these variables, a case that has one of the characteristics is coded as a one, and cases without the characteristic are coded as a zero. These variables include the following

- Documentation level (low or full documentation, with full documentation = 1);
- Loan purpose (purchase or refinance, with purchase = 1), and
- Occupancy status (Owner-occupied or not, with owner-occupied = 1).

The model also includes four continuous variables measured at the time of loan origination:

- Combined Loan-to-Value;
- FICO score at origination;
- Original Interest Rate, and
- Original Payment, a constructed variable equal to Original Loan Balance X Initial Interest Rate.

Finally, the model includes four time-varying covariates:

- Interest Rate Differential(t) = Original Interest Rate - Market Interest Rate(t)
- Change in Payment(t) = [Original Interest Rate - Market Interest Rate(t)] x Original Balance
- Change in Value(t) = (Original Value) x [%Change in Case-Shiller Index(t)], and
- Unemployment Rate(t)

The seasonally adjusted civilian unemployment rate and Case-Shiller Index data were matched to each loan based upon MSA/CBSA if available; otherwise a state or national level measure was used, respectively. The market interest rate data was obtained from Freddie Mac, and it was matched based upon the rate type of the loan. Fixed rate loans were matched to the monthly average of the average weekly 30-year rate; adjustable rate loans were matched to the monthly average of the average weekly 1-year rate.

Parameter Estimates

Table 8 presents estimation results for the fixed rate and adjustable rate loan group models. Recall that each estimated rate type model has been stratified across insured and non-insured mortgage classes. As a result, we have two sets of parameter estimates, with a given parameter set applying equally to both strata within a given rate group.

The estimated coefficients have signs that are consistent with expectations (recall that due to the proportional hazard specification, a positive parameter indicates that the hazard of default is increasing with the covariate value).

Table 8: Cox Stratified Proportional Hazards Model Parameter Estimates

Loan Type	Fixed Rate	Adjustable Rate
Documentation Level (1=Low)	0.37310	0.76391
Loan Purpose (1=Purchase)	-0.05802	-0.22628
Occupancy Status (1=Owner-Occupied)	-0.14402	-0.38135
Combined LTV at Origination	0.02400	0.03127
FICO Score at Origination	-0.00880	-0.00589
Original Interest Rate	0.21298	-0.12347
Original Payment (Original Int. Rate*Original Balance)	-0.00478	0.01213
Rate Differential (Original Int. Rate - Market Int. Rate)	0.15648	0.09901
Change in Payment (Original Int. Rate - Market Int. Rate)*Original Balance	0.04650	-0.00108**
Change in Value (Original Value)*(%Change in Case Shiller Index)	0.04439	0.02643
Unemployment Rate	0.16021	0.18988

*Note: **Estimate not significantly different from zero. All other estimates are significant at the 0.0001 level.*

Low documentation, non owner-occupied, high CLTV, and low FICO loans are of greater default risk than loans with the opposite characteristics. Somewhat surprisingly, loans supporting refinancing are of greater risk than loans supporting a new purchase – a result seen in the simple descriptive statistics for this period. The coefficients on the time varying covariates measuring the rate differential between original and current market rates, the change in payment and the change in value are also positive. The greater the difference between the original interest rate and the current market rate, or the greater the different between the original home value and the current implied market value (i.e., the absolute value of potential equity loss), the greater the default risk. Similarly, the higher the current level of unemployment in the MSA or state when the property is located, the higher the default risk. All these impacts are similar across both fixed rate and adjustable rate mortgage groups.

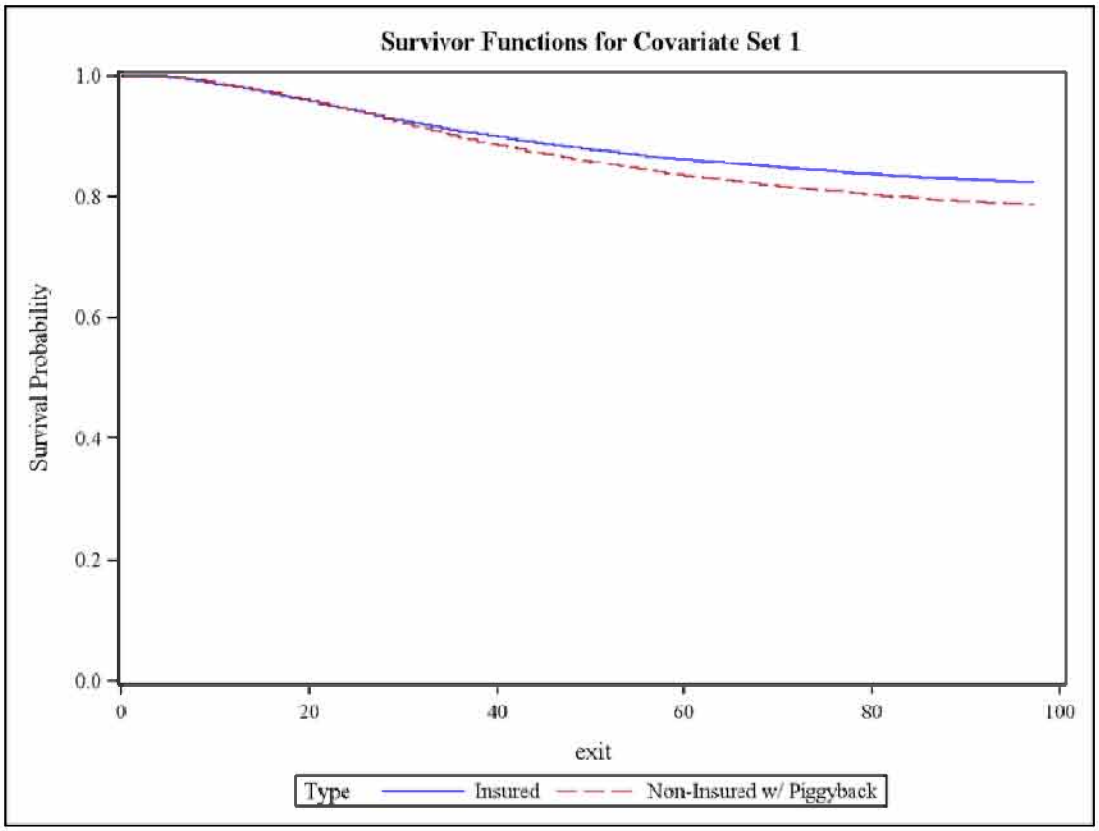
In contrast, when we consider the impact of the level of the original interest rate or the level of the original payment, the signs of the coefficient estimates are reversed between fixed and adjustable rate groups. However, the sign differences make sense: for fixed rate loans, holding original balance constant, higher original interest rates mean higher fixed payments and higher default risk. For

adjustable rate loans, the higher original rate probably implies that the risk of a payment shock when the original rate adjusts to market rates is lowered, along with default risk.

Baseline Survival Curve Estimates

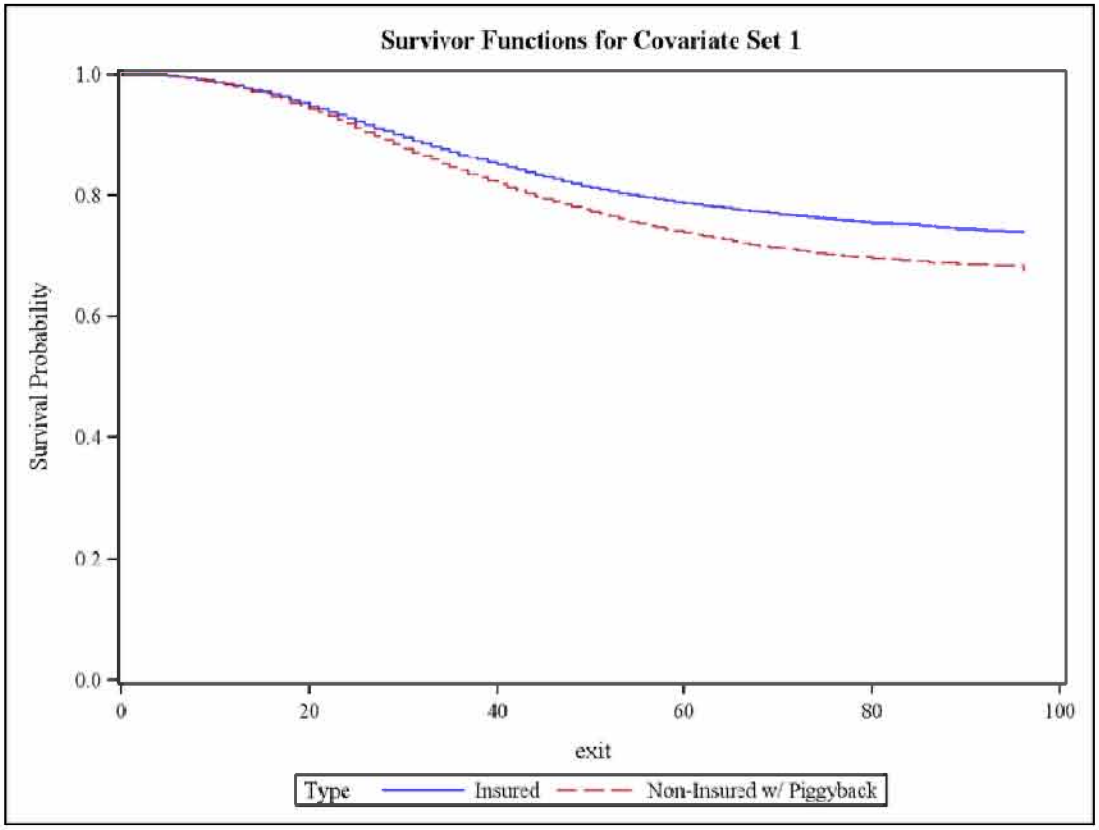
To illustrate the differences between insured and non-insured loans, it is useful to compare the implied baseline survivor functions for the strata corresponding to our estimated set of models[4]. Figures 4 and 5 shows the implied baseline survival curves resulting from our stratified Cox PH model; estimates reflect the survival probability at month t, evaluated at the mean value covariates across the sample population. Effectively, these baseline survival curve estimates illustrate the fundamental differences in performance between insured and non-insured loan groups, controlling simultaneously and equally for all the effects we have been able to attribute to covariates.

Figure 5. Parametric Baseline Survival Curve Estimates, Fixed Rate Loans



[4] The baseline hazards and survival functions are estimated as arbitrary functions of time through implementation of a restricted maximum likelihood estimation of the $\alpha_c(t)$ function, in which the covariates for explanatory variables are restricted to their previously estimated values.

Figure 6. Parametric Baseline Survival Curve Estimates, Adjustable Rate Loans



In these curves, the higher default risk associated with the non-insured (with piggyback) loans is very clear – at times even more so than in the empirical survival curves (which did not control for the effect of covariates). For both fixed rate and adjustable rate mortgages, controlling for the impact of covariates results in implied baseline (strata specific) survival curve estimates in which insured loans continue to demonstrate lower extreme delinquency and default risk than non-insured (with piggyback) loans.

Tables 9 and 10 respectively present the estimated numerical baseline survival rates and cumulative default rates, by strata, for selected months-since-origination. Overall, across both fixed and adjustable rate loans, the proportion of non-insured loans surviving to 72 months was .798, compared to .833 for insured loans. Significantly, as shown in Table 10, this difference implies that the baseline cumulative default rate of non-insured loans is 20.98% percent higher than that of insured loans.

Table 9. Estimated Baseline Survival Rates, S(t)

Proportion Surviving to Selected Months

Rate Type	Type	Months					
		12	24	36	48	60	72
All	Insured	0.983	0.943	0.903	0.873	0.851	0.833
	Non-Insured w/ Piggyback	0.983	0.942	0.890	0.851	0.820	0.798
	Percent Difference (Non-Insured relative to Insured)	*0.04%*	*-0.13%*	*-1.44%*	*-2.52%*	*-3.65%*	*-4.20%*
Fixed Rate	Insured	0.983	0.946	0.910	0.884	0.863	0.846
	Non-Insured w/ Piggyback	0.983	0.946	0.900	0.865	0.835	0.815
	Percent Difference (Non-Insured relative to Insured)	*0.08%*	*0.04%*	*-1.13%*	*-2.15%*	*-3.22%*	*-3.66%*
Adj. Rate	Insured	0.983	0.930	0.869	0.820	0.788	0.767
	Non-Insured w/ Piggyback	0.981	0.920	0.841	0.782	0.740	0.710
	Percent Difference (Non-Insured relative to Insured)	*-0.19%*	*-0.99%*	*-3.16%*	*-4.62%*	*-6.10%*	*-7.32%*

Table 10: Estimated Baseline Cumulative Default Rates, F(t)

Cumulative Proportion Defaulting by Selected Months

Rate Type	Type	Months					
		12	24	36	48	60	72
All	Insured	0.017	0.057	0.097	0.127	0.149	0.167
	Non-Insured w/ Piggyback	0.017	0.058	0.110	0.149	0.180	0.202
	Percent Difference (Non-Insured relative to Insured)	*-2.15%*	*2.09%*	*13.47%*	*17.40%*	*20.79%*	*20.98%*
Fixed Rate	Insured	0.017	0.054	0.090	0.116	0.137	0.154
	Non-Insured w/ Piggyback	0.017	0.054	0.100	0.135	0.165	0.185
	Percent Difference (Non-Insured relative to Insured)	*-4.60%*	*-0.65%*	*11.38%*	*16.32%*	*20.23%*	*20.10%*
Adj. Rate	Insured	0.017	0.070	0.131	0.180	0.212	0.233
	Non-Insured w/ Piggyback	0.019	0.080	0.159	0.218	0.260	0.290
	Percent Difference (Non-Insured relative to Insured)	*10.78%*	*13.11%*	*20.99%*	*21.08%*	*22.66%*	*24.02%*

c. Diagnostics: Evaluating the Proportional Hazards Assumption

The assumption of the proportional relationship between hazards and covariates that is implied by the Cox model specification should be subjected to an empirical assessment. To perform such an assessment, it is increasingly common to construct residuals along the lines proposed by Schoenfeld (1982). Instead of a single residual for each individual observation, Schoenfeld's method results in

constructing separate residuals for each covariate, for each individual loan, using only those loans that defaulted (were not censored.)

Since the Schoenfeld residuals are, in principle, independent of time, a plot that shows a non-random pattern against time is evidence of violation of the proportional hazards assumption. Appendix C provides plots of the estimated, scaled Schoenfeld Residuals against rank time. The minimal departures from a general, random zero-slope pattern vs. time provide reasonable support for the proportional hazards specification used in our analysis.

5. Conclusions

The analysis conducted by Promontory generally confirms the results presented in Genworth's 2010 study, and shows that, controlling for various factors, mortgages with piggyback second lien loans have historically experienced higher lifetime rates of severe delinquency than insured mortgages. This conclusion is supported by tabular analysis, graphical vintage curve analysis and by the results from conducting an analysis using statistical methods of survival analysis.

We present the results from estimation from both simple and extended versions of stratified Cox proportional hazards models, the latter estimated across and by US census region. Risk factor parameter estimates are generally in line with expectations as to sign, although variability in the magnitude of estimates exists across regions. We also compare the implied baseline survival curves from the estimated models to smoothed Kaplan-Meier estimates of the empirical survival function. Our modeling approach allows us to produce separate baseline survival estimates for insured and non-insured (with piggyback) mortgages. These baseline curves have been controlled for the impact of risk factors on performance in a way that cannot accomplished by simple tabular or graphical analysis of empirical data

Overall, our analysis supports the assertion that the historical performance of first lien MI-insured loans has been associated with lower rates of extreme delinquency or default, when compared to non-insured first lien loans accompanied by a piggyback second lien, and when controlling for various risk factors.

In closing, it is important to note that the stratified survival analysis regression methodology we deploy does not measure the impact that MI-related underwriting may have on adjusting the factors which are controlled for in the study, such as LTV. Any impact that MI may have on mitigating the risk associated with such factors is likely to be embedded in the model covariates, and would not be reflected in our estimated baseline performance differences between insured and non-insured loans.

The above point should serve to emphasize the importance of the multi-pronged approach that we have taken to consider the impact of MI, and should stimulate further research on this important issue.

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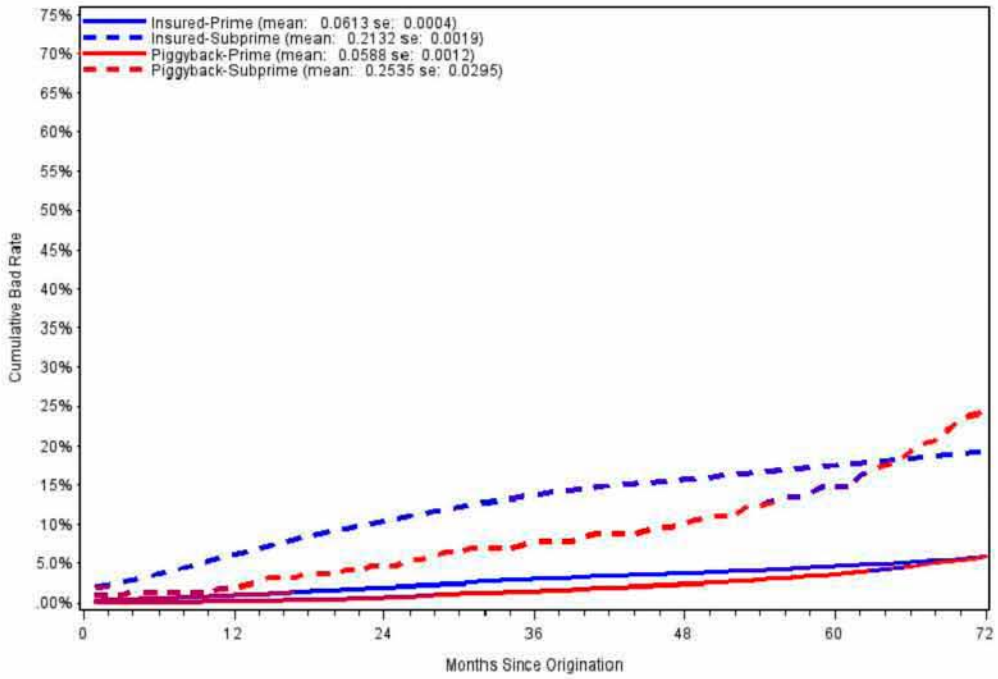
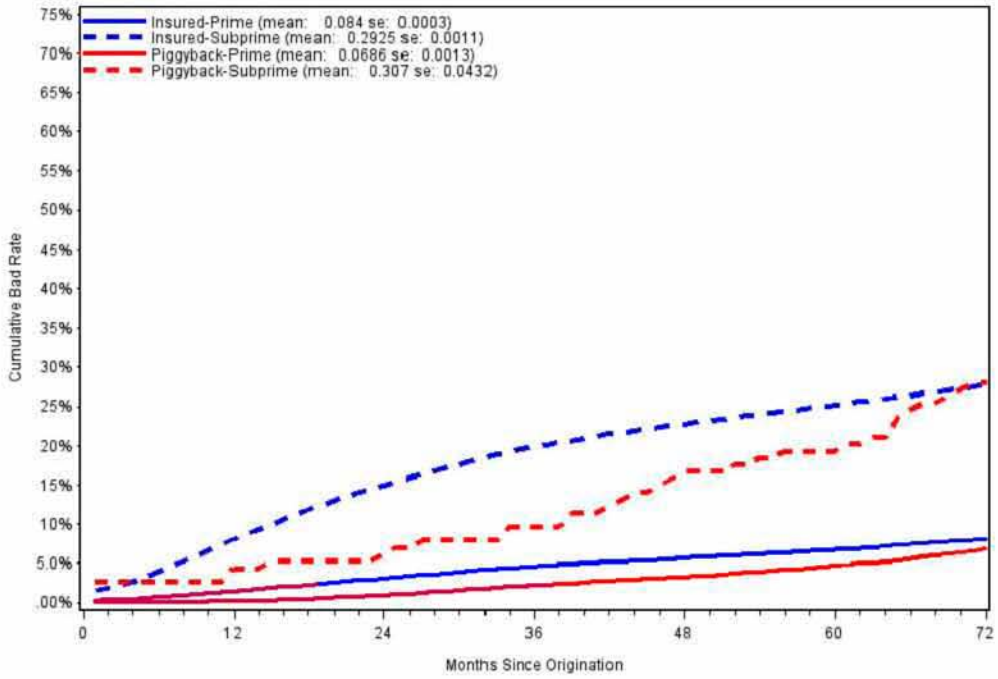
Appendix A: Vintage Curves

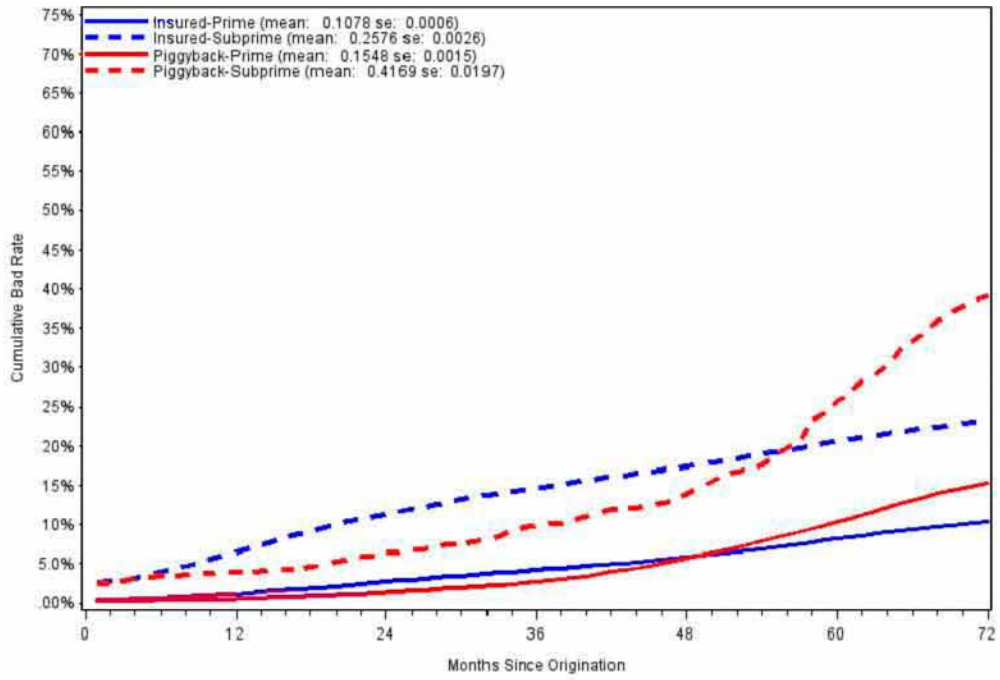
Cumulative Bad Rates for 2003 Vintage and CLTV LE90



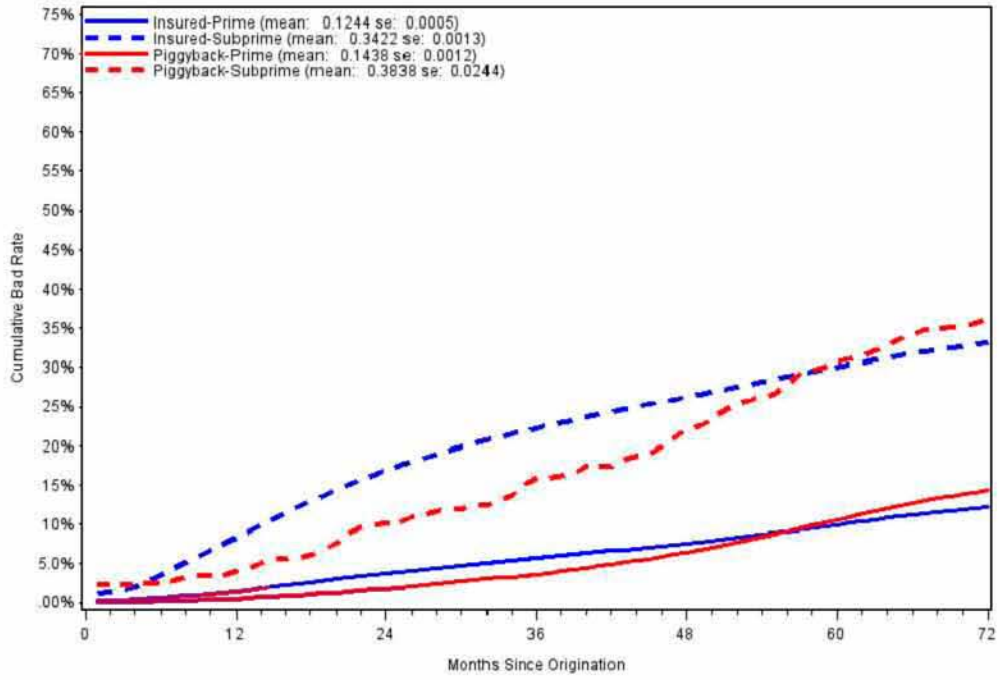
Cumulative Bad Rates for 2003 Vintage and CLTV GT90



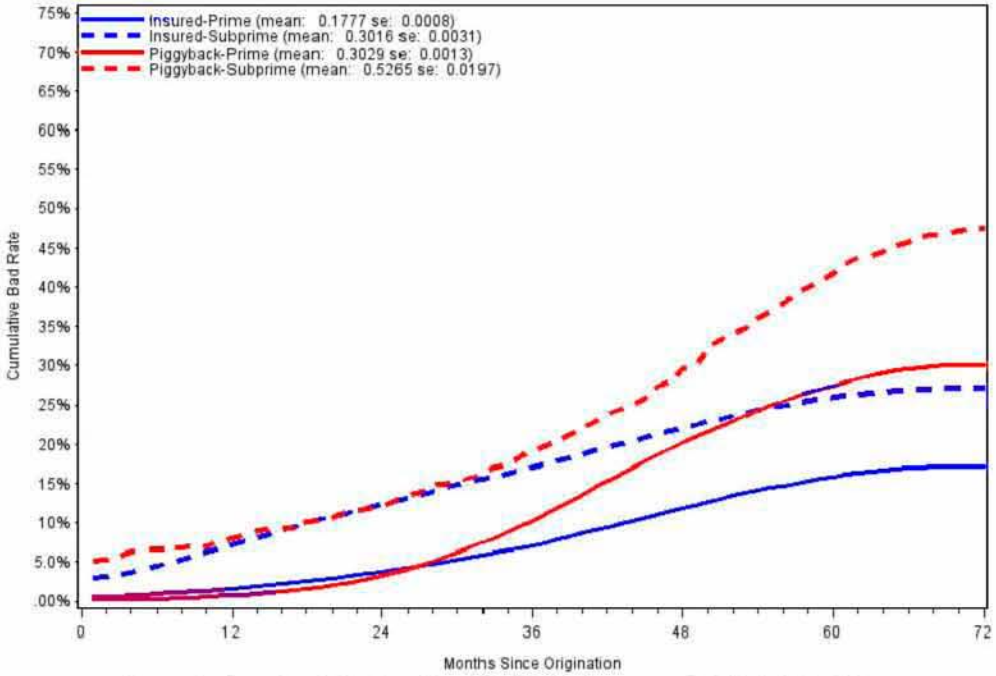
Cumulative Bad Rates for 2004 Vintage and CLTV LE90



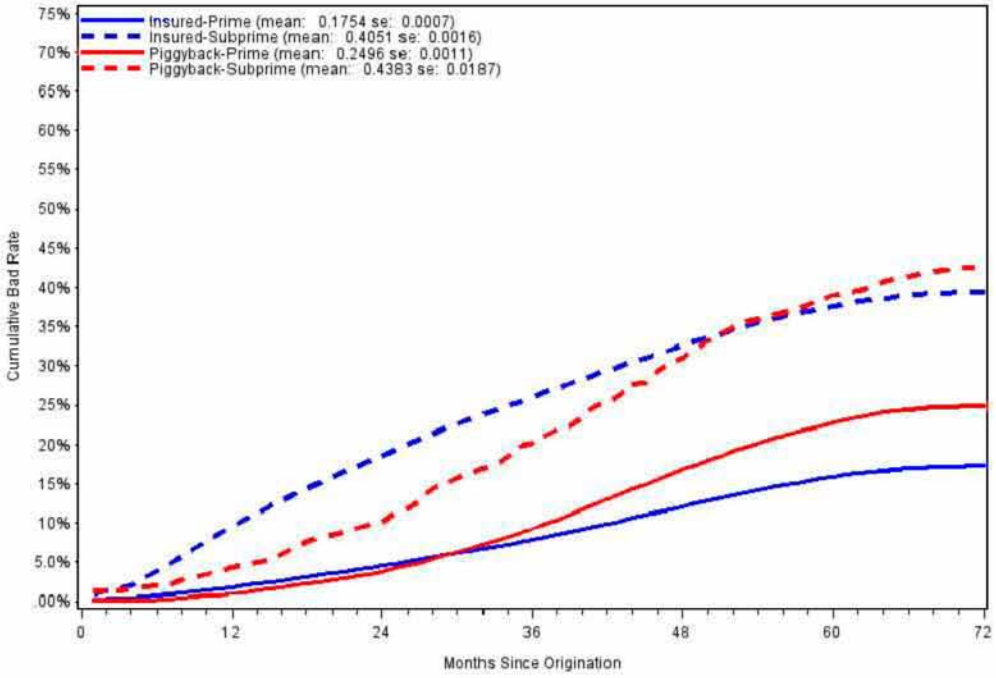
Cumulative Bad Rates for 2004 Vintage and CLTV GT90



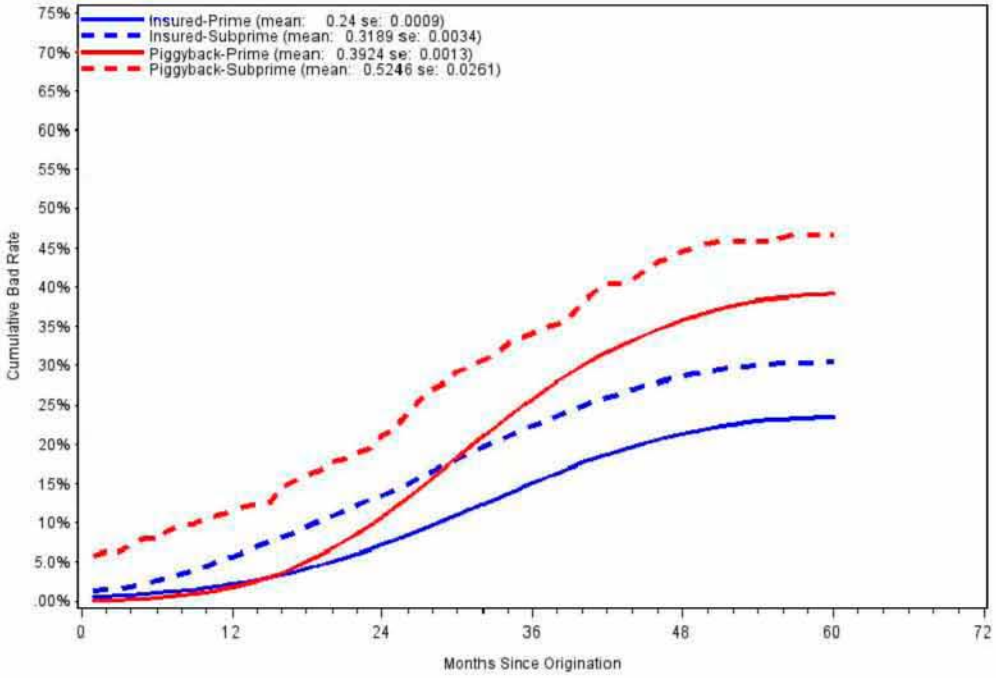
Cumulative Bad Rates for 2005 Vintage and CLTV LE90



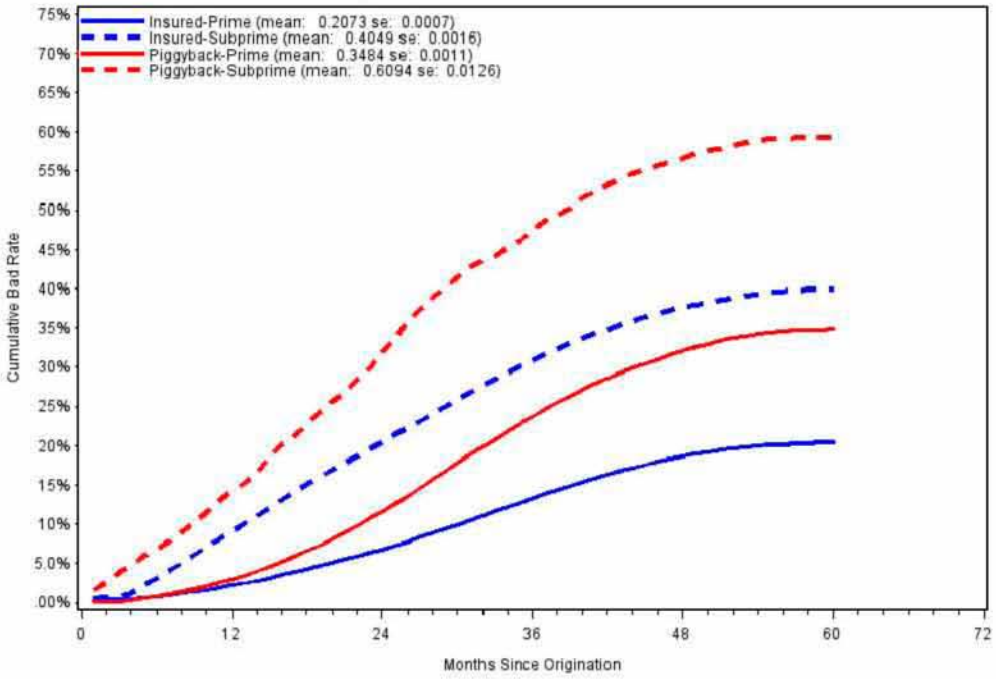
Cumulative Bad Rates for 2005 Vintage and CLTV GT90



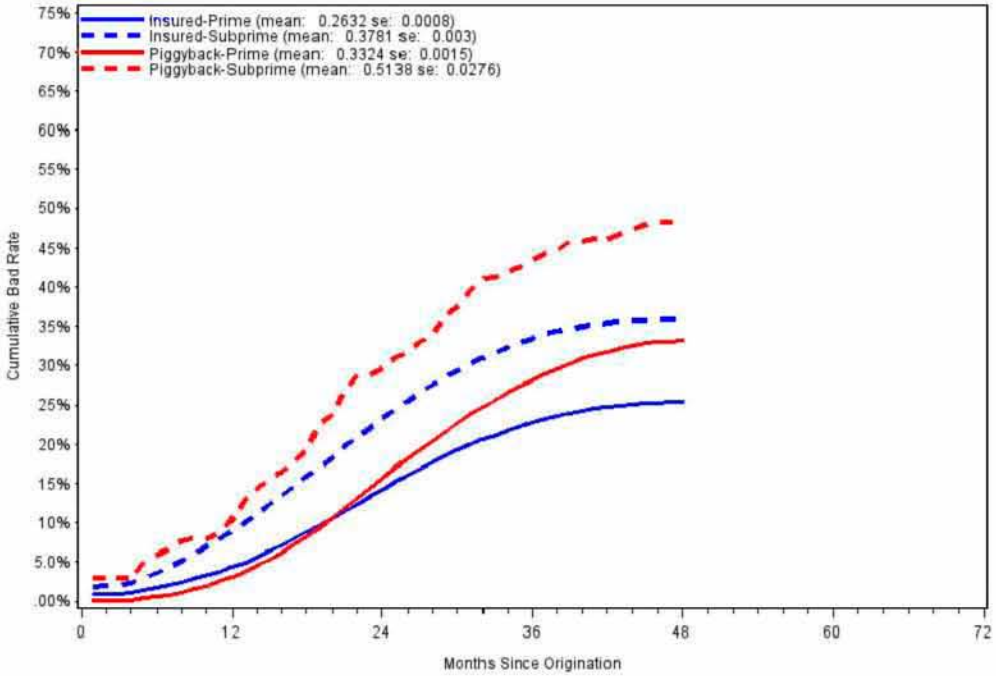
Cumulative Bad Rates for 2006 Vintage and CLTV LE90



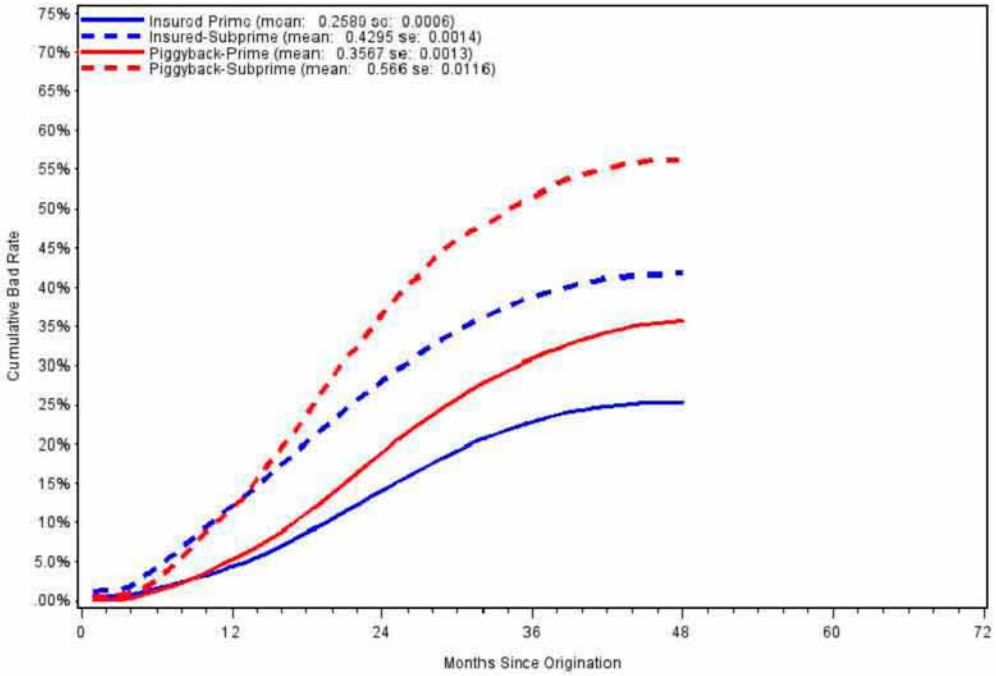
Cumulative Bad Rates for 2006 Vintage and CLTV GT90



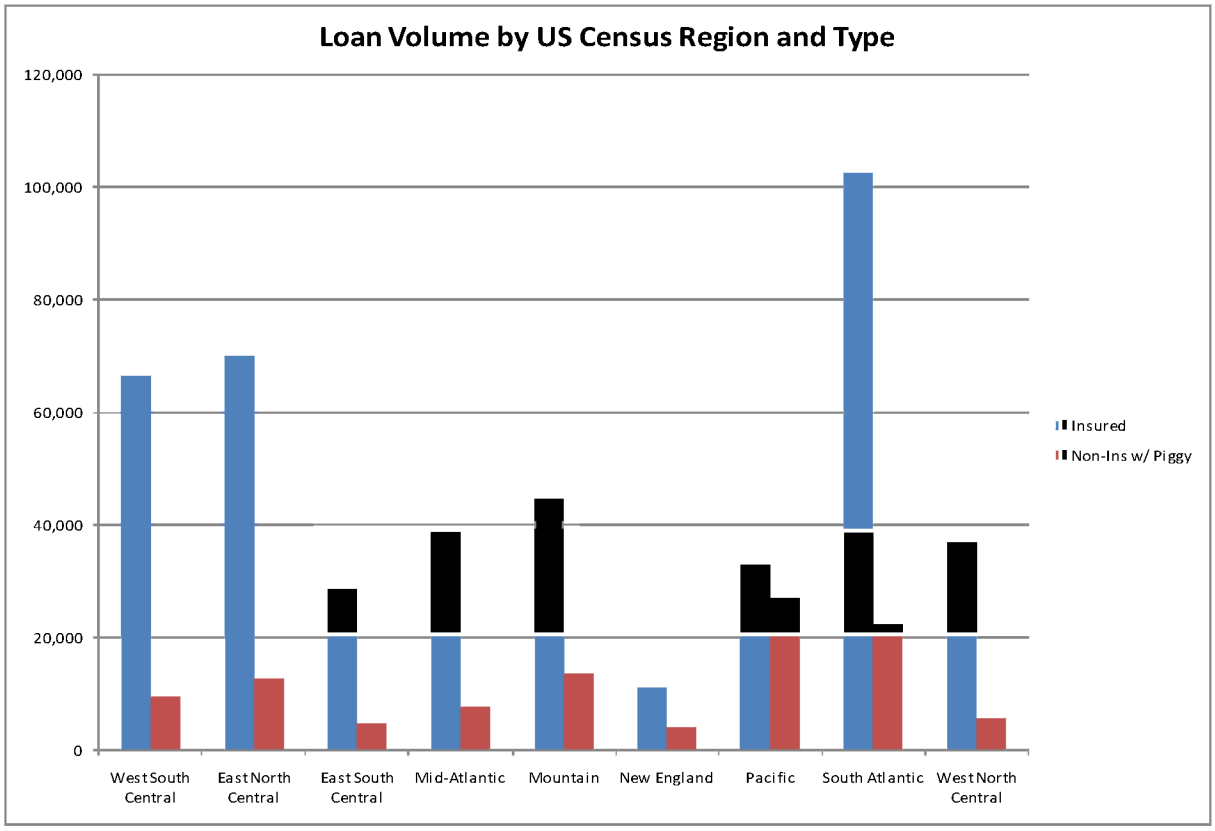
Cumulative Bad Rates for 2007 Vintage and CLTV LE90

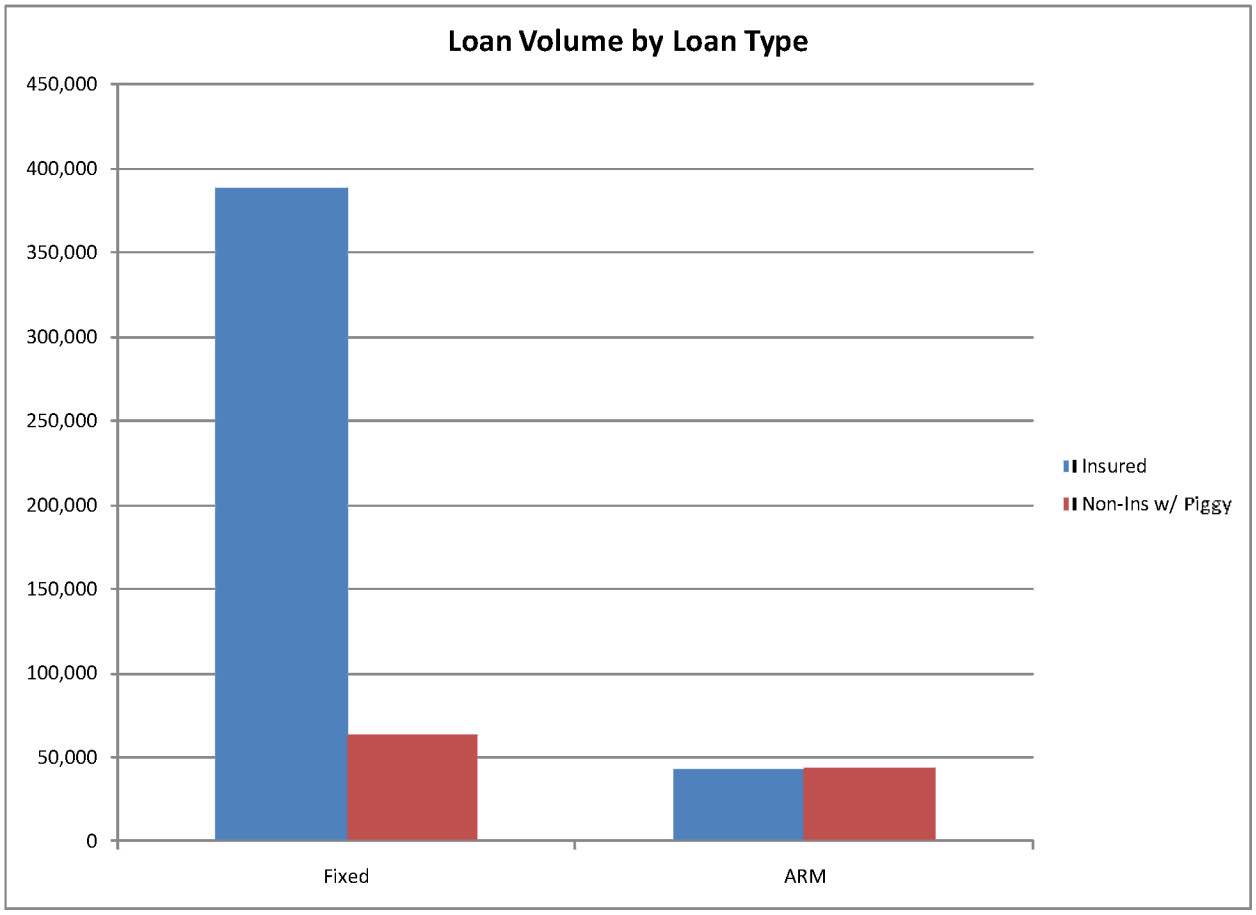


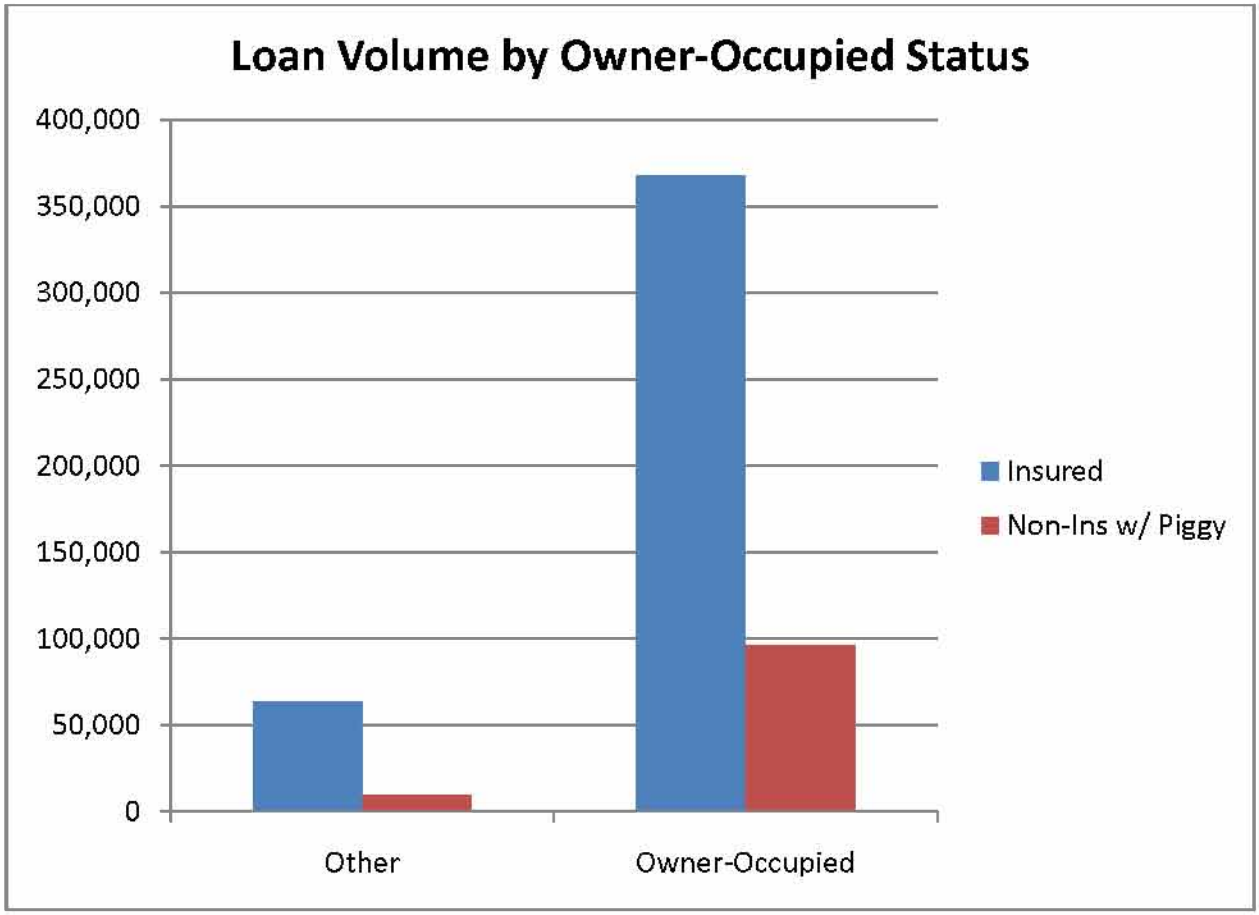
Cumulative Bad Rates for 2007 Vintage and CLTV GT90

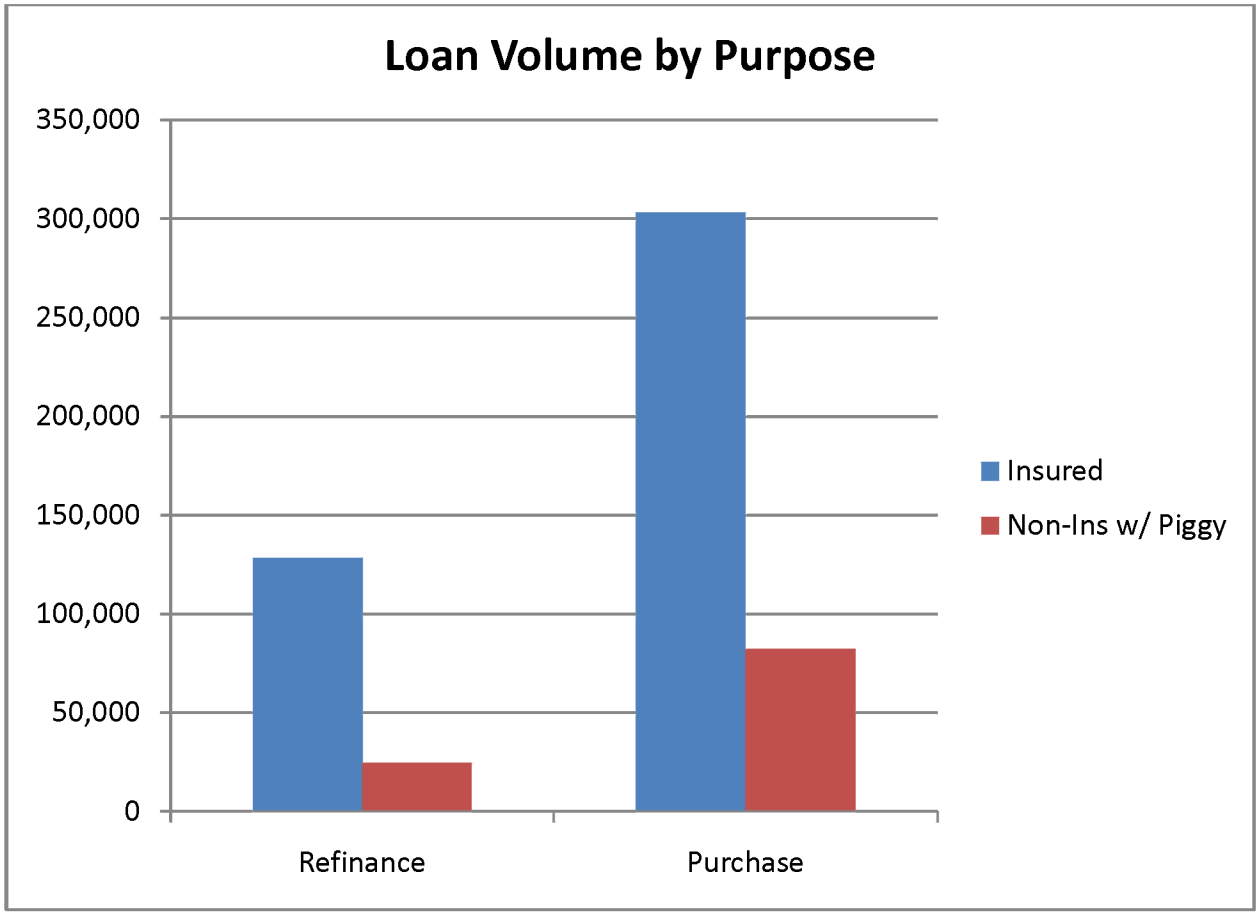


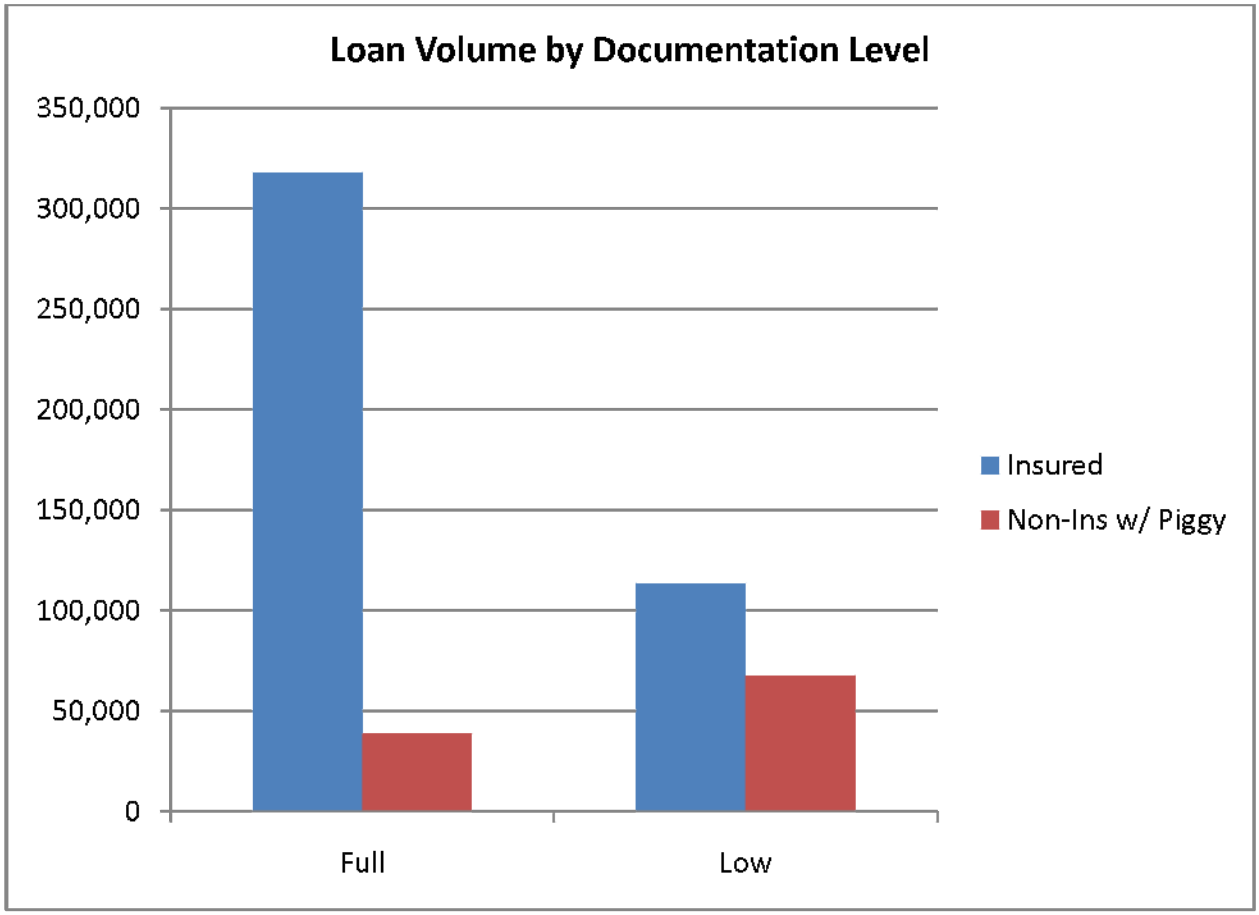
Appendix B: Survival Analysis Modeling Dataset Summary

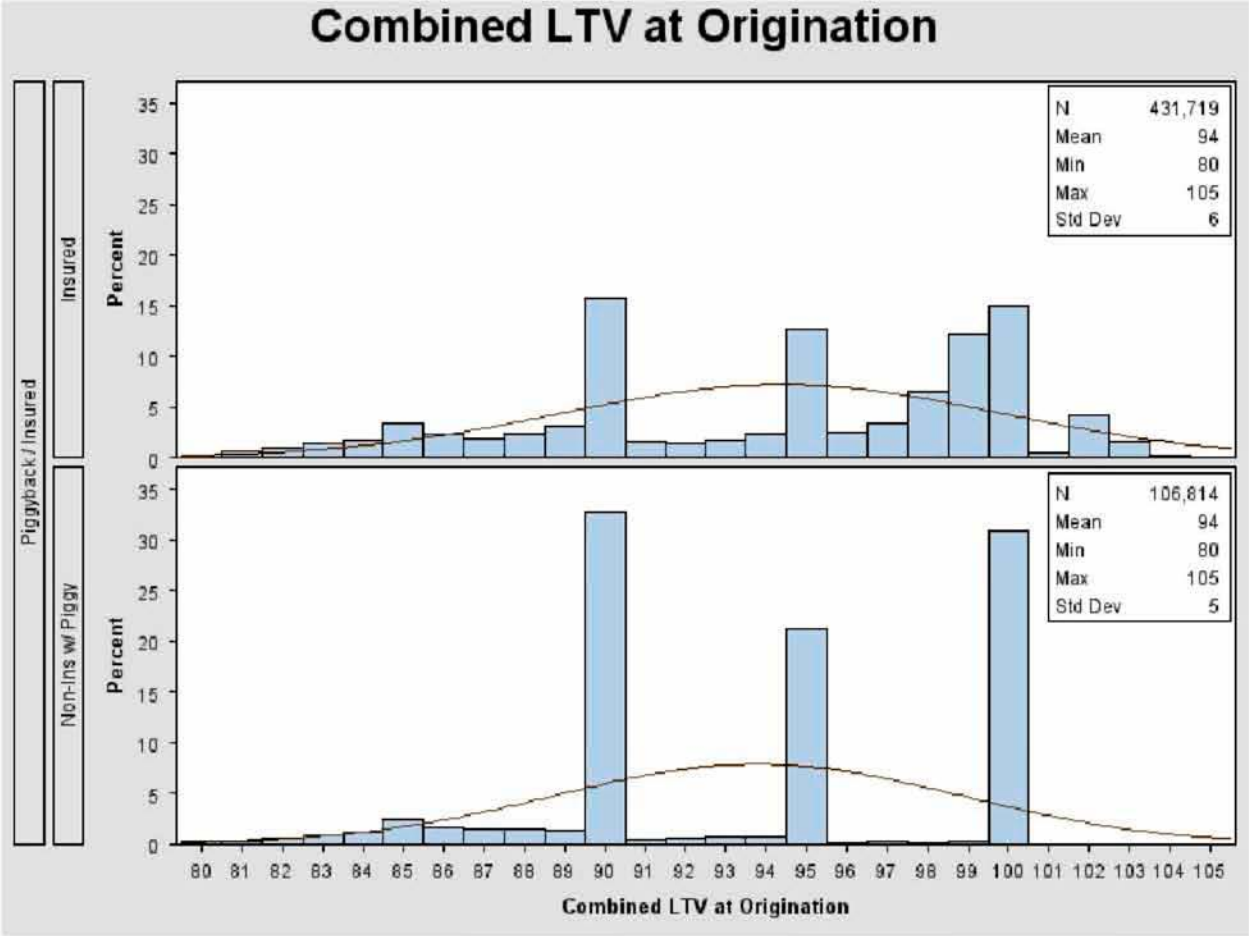


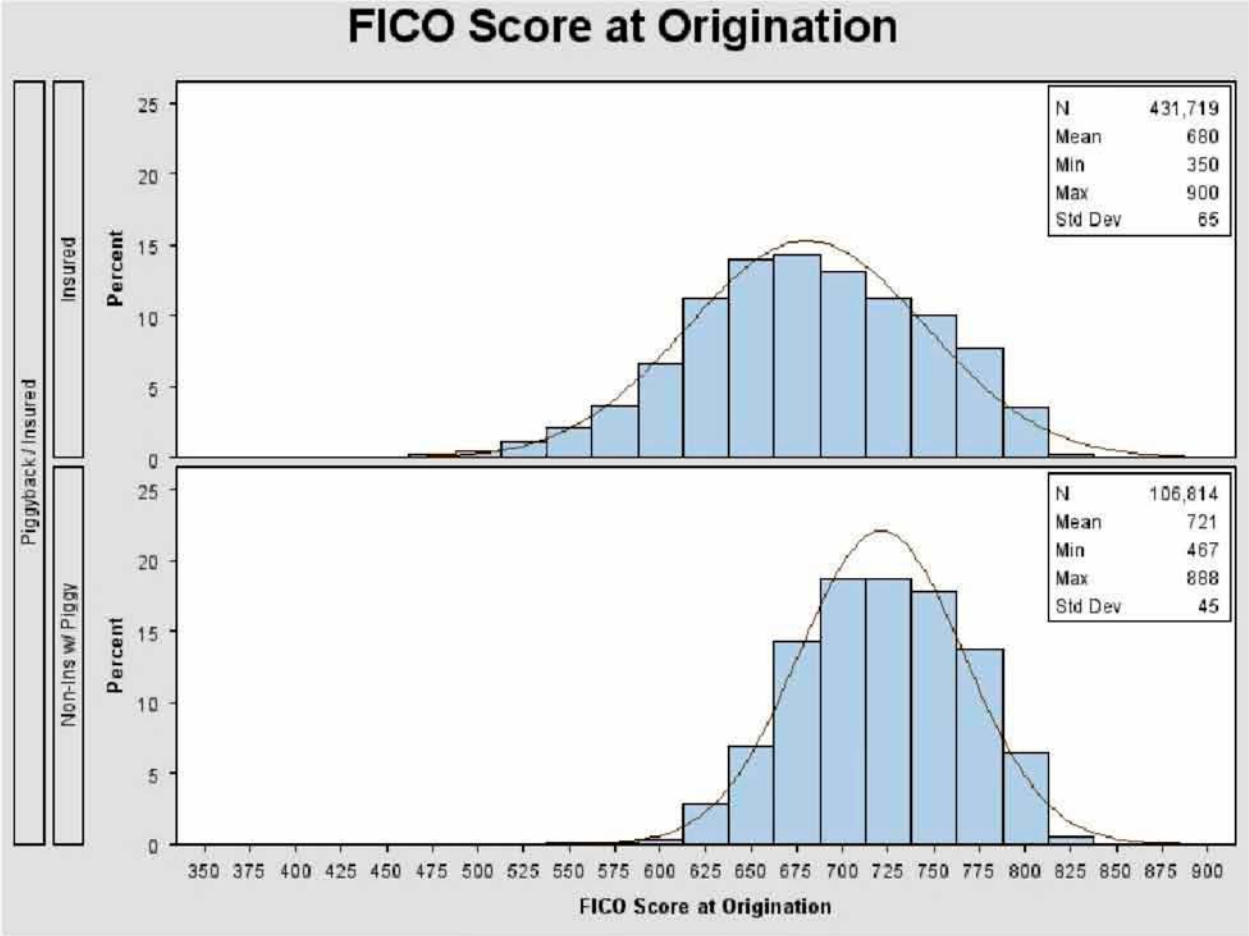












Appendix C: Scaled Schoenfeld Residual Plots

The Schoenfeld residual, r_{ik} is the covariate value, X_{ik}, for the i^{th} loan which actually defaulted at time t, minus the expected value of the covariate for the risk set at time t (i.e., a weighted-average of the covariate, weighted by each loan's likelihood of defaulting at t).

Because they will vary in size and distribution, the Schoenfeld residuals are usually scaled before being analyzed. The k-dimensional vector of **Scaled Schoenfeld Residuals, SR,** for the i^{th} loan is defined as:

$SR = \boldsymbol{\beta} + D*Cov(\boldsymbol{\beta})*\mathbf{r}_i'$

where

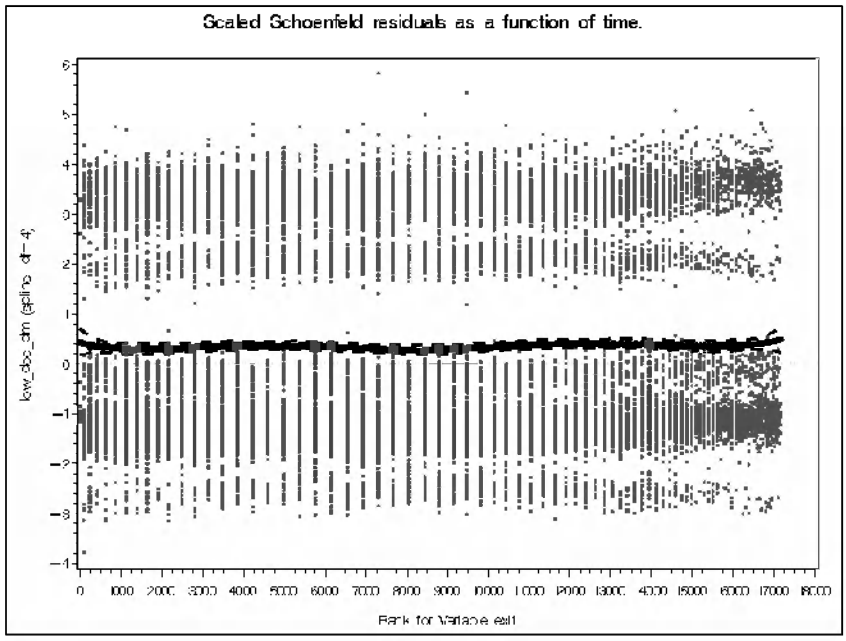
$\boldsymbol{\beta}$=the estimated Cox model coefficient vector

D= the number of loans defaulting, and

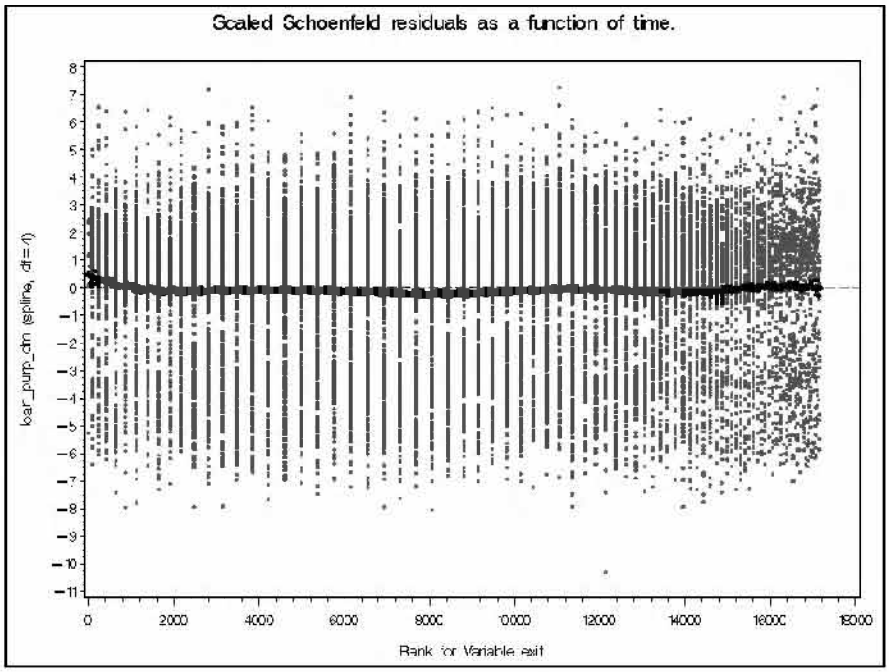
$\mathbf{r}_i$= the vector of Schoenfeld residuals for loan i.

Plots for Fixed-Rate Loans, by Covariate

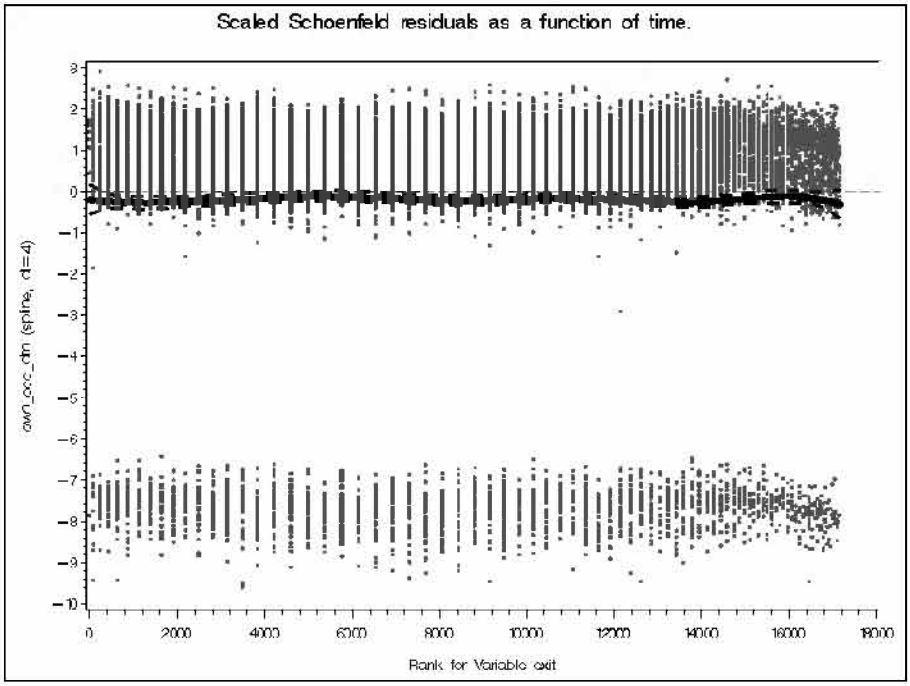
Documentation Level



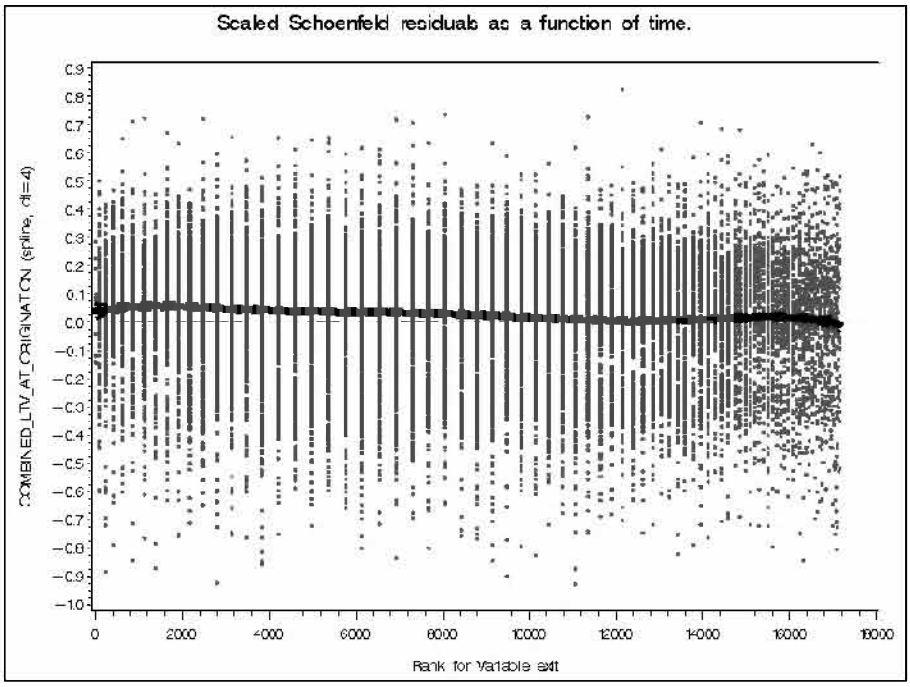
Loan Purpose



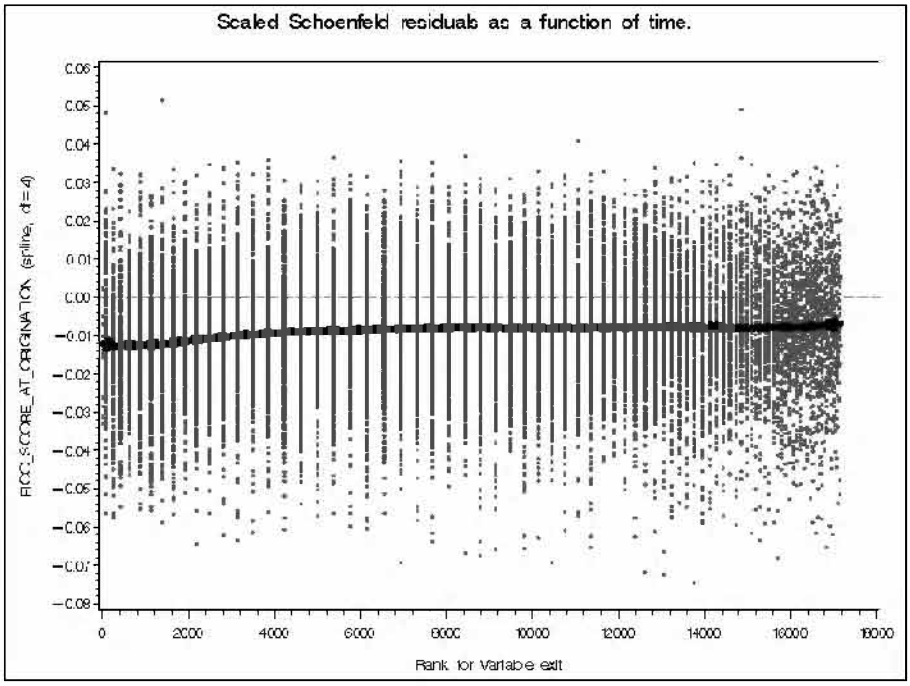
Occupancy Status



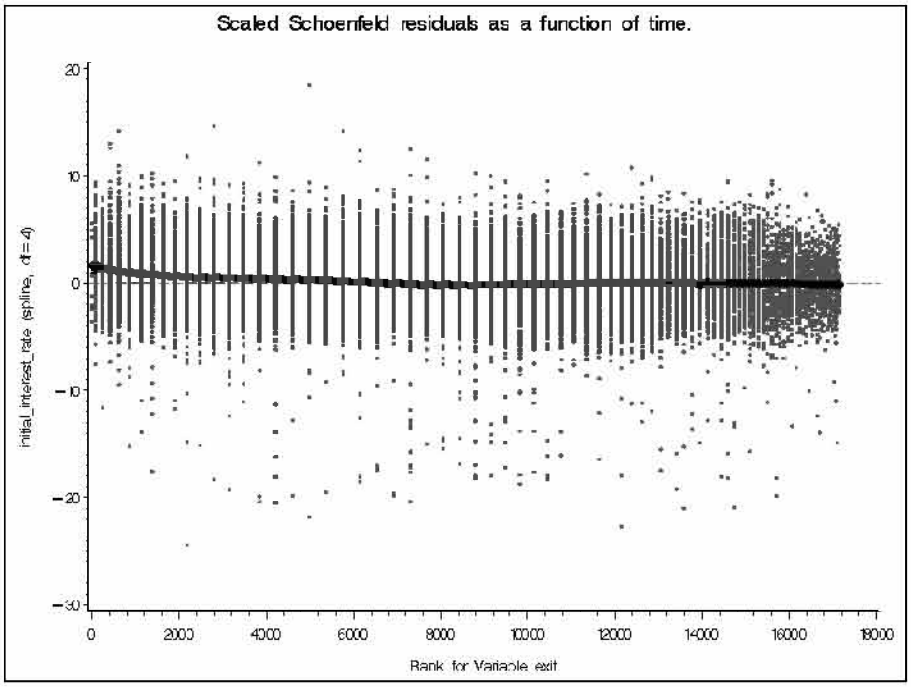
Combined LTV at Origination



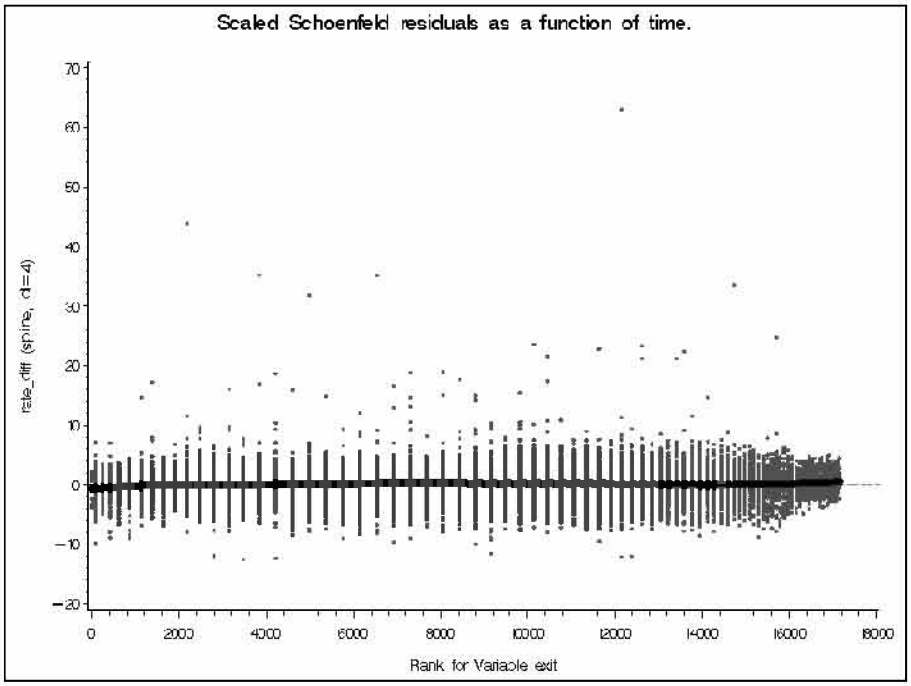
FICO Score at Origination



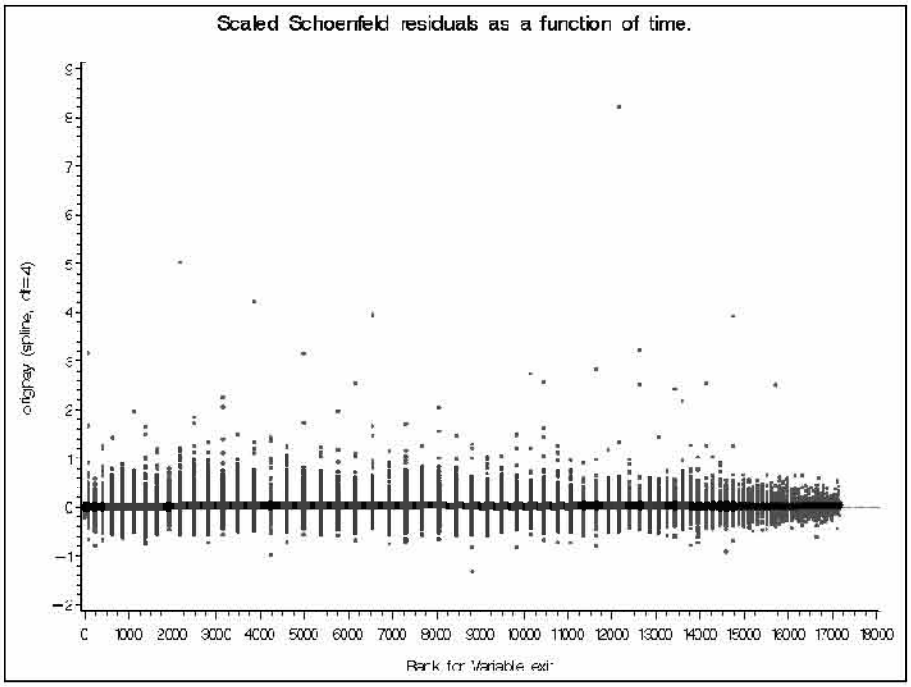
Original Interest Rate



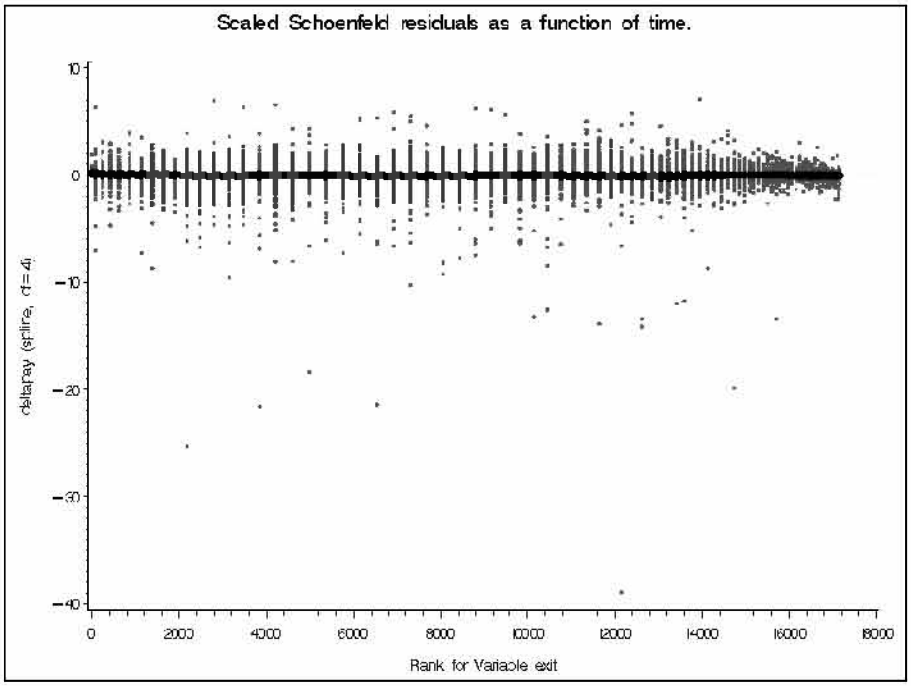
Rate Differential (t)



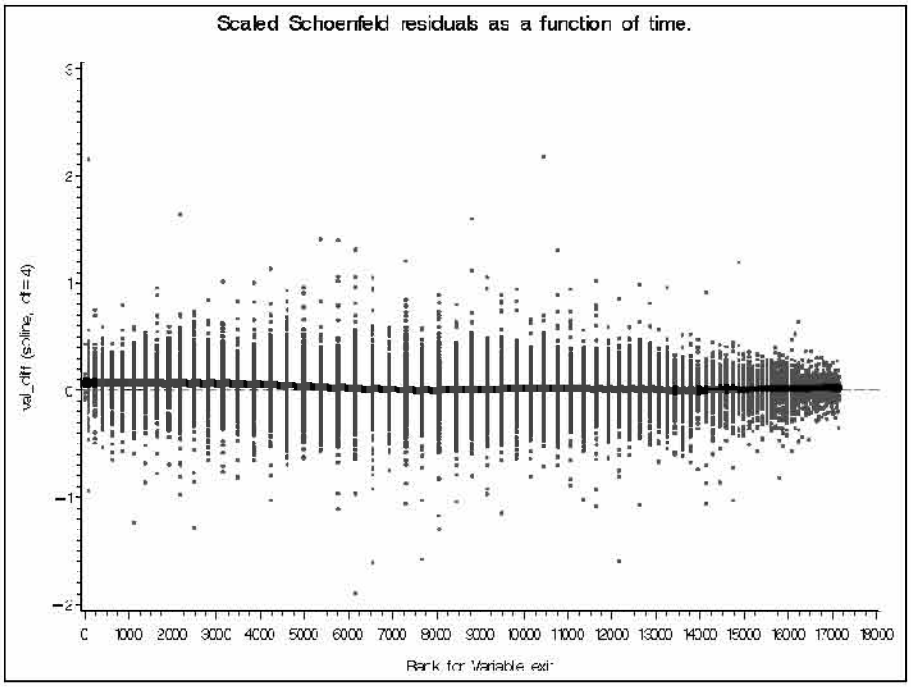
Original Payment



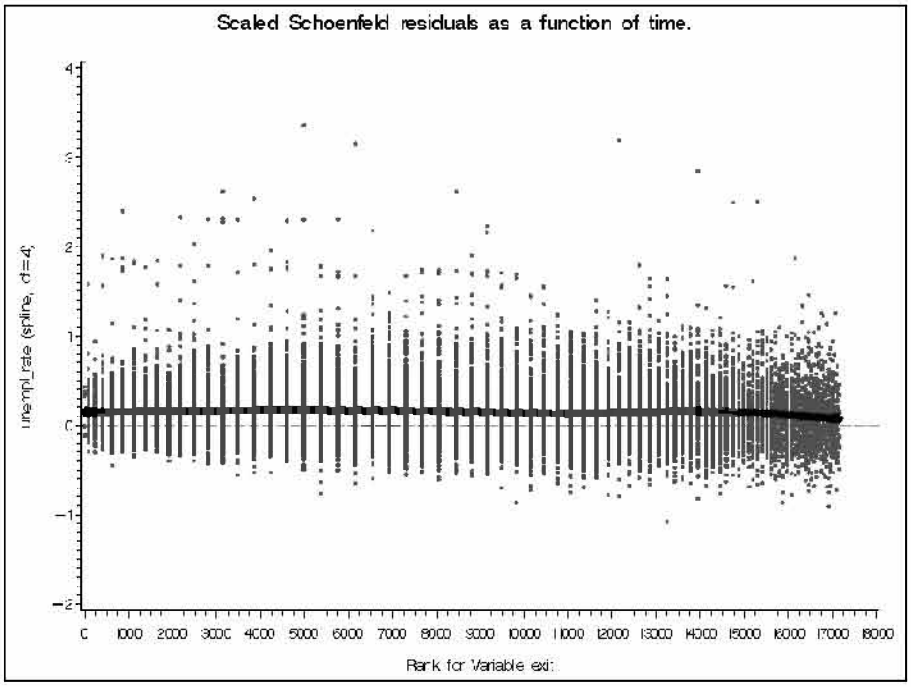
Change in Payment (t)



Change in Value (t)

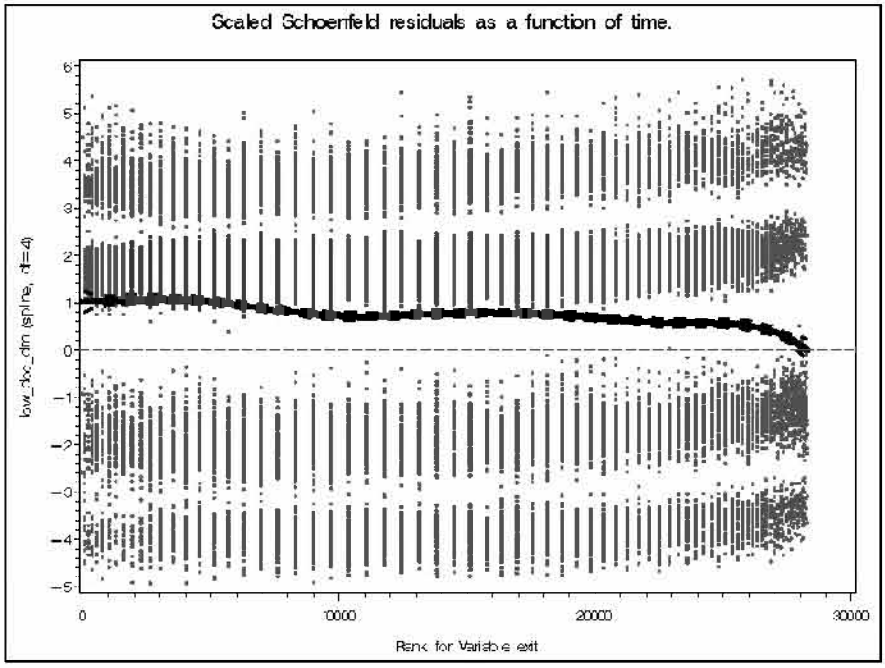


Unemployment Rate (t)

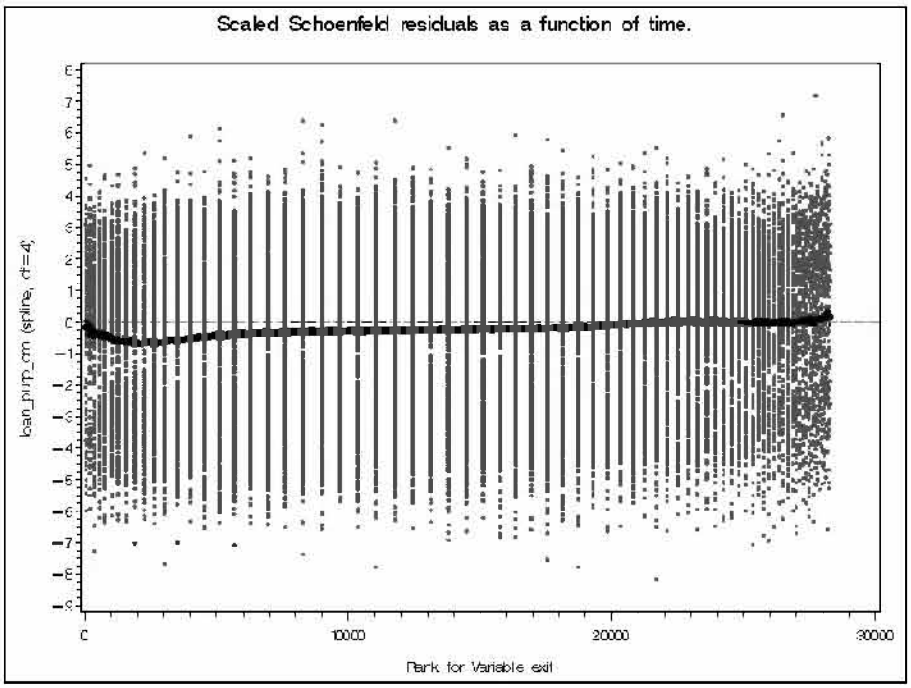


Plots for Adjustable-Rate Loans, by Covariate

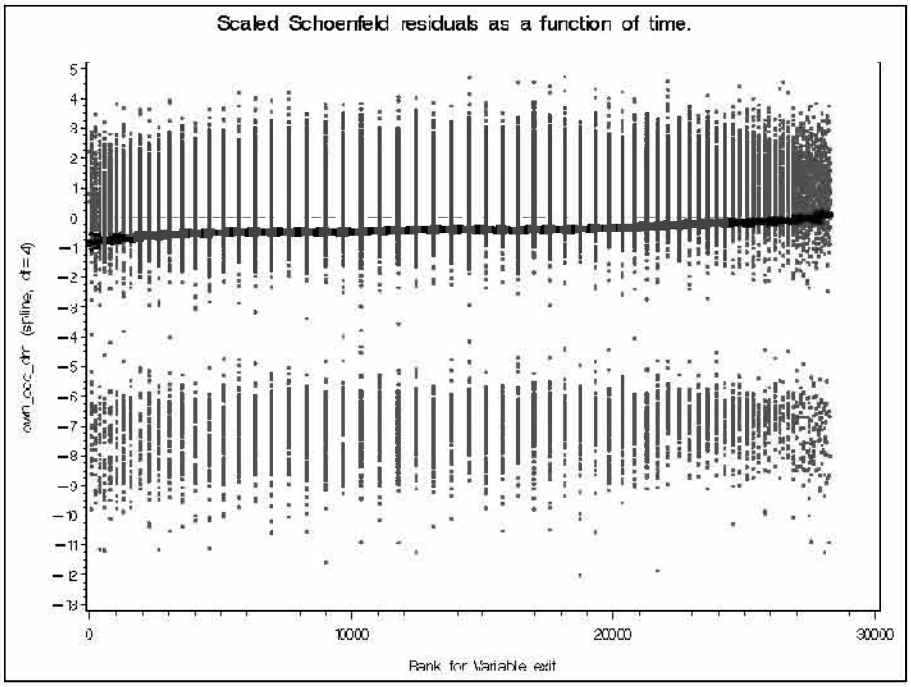
Documentation Level



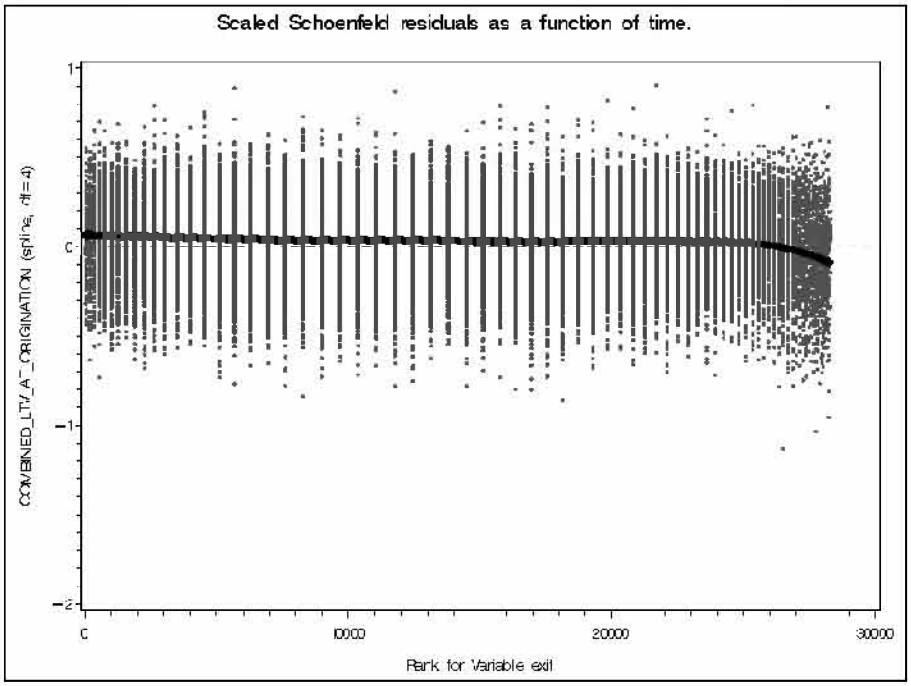
Loan Purpose



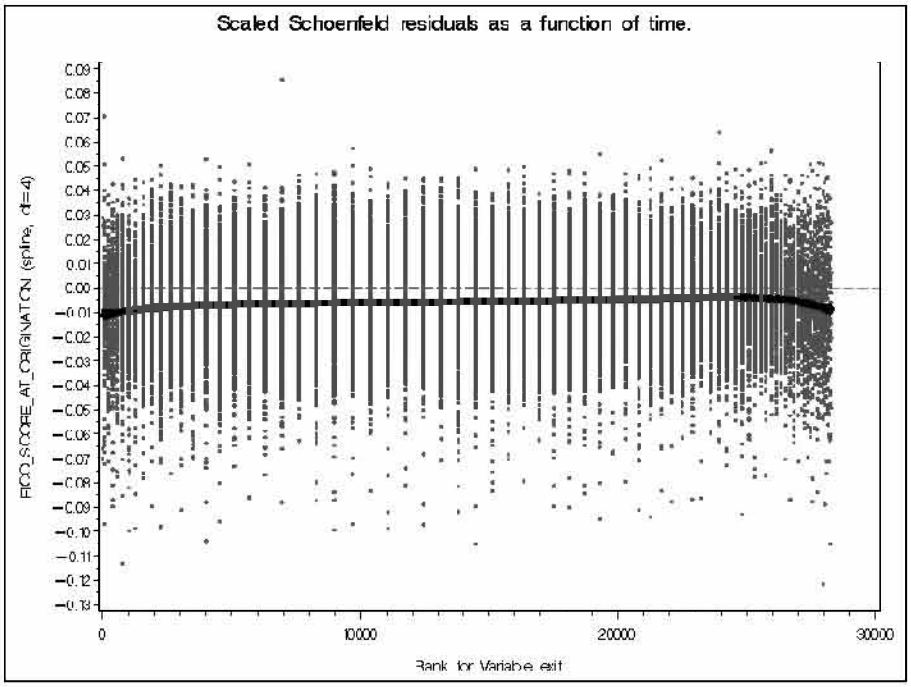
Occupancy Status



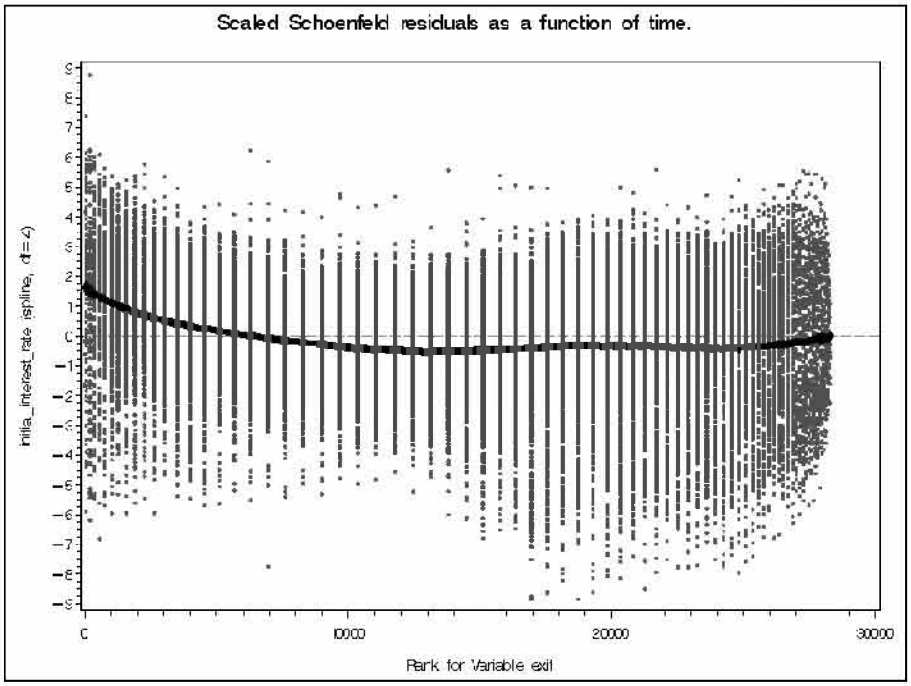
Combined LTV at Origination



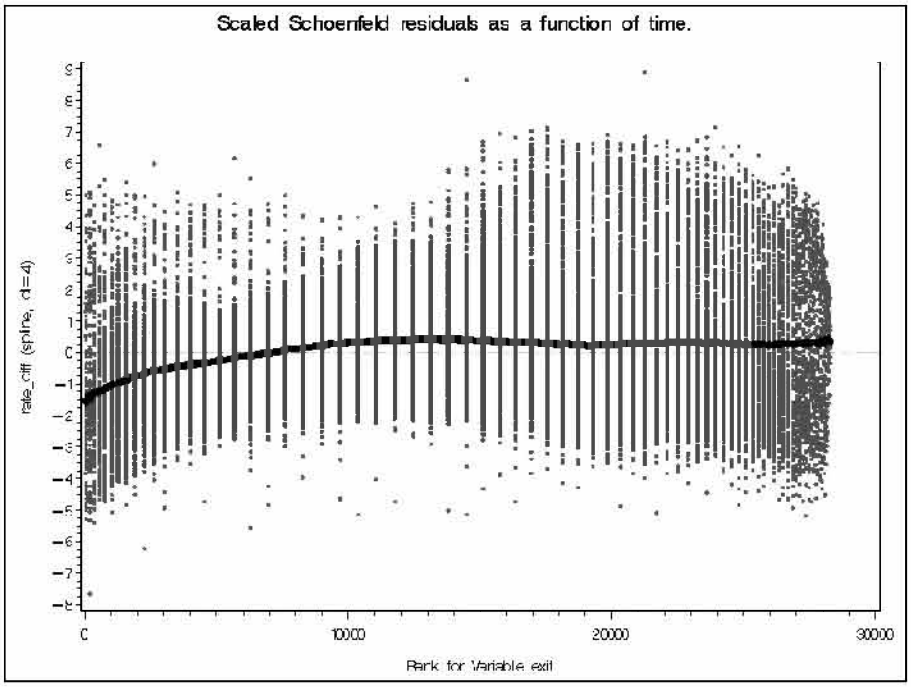
FICO Score at Origination



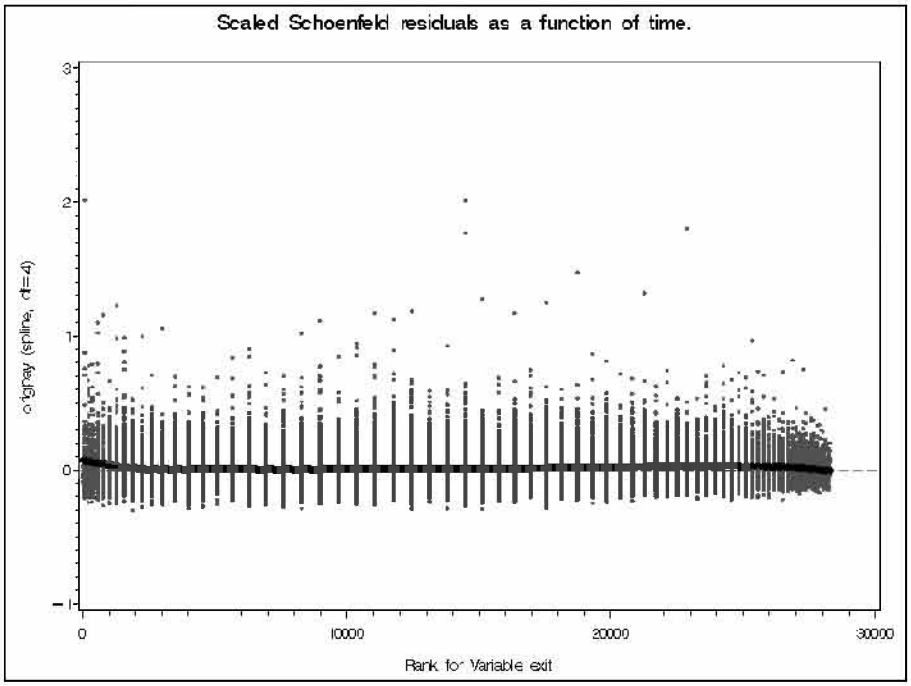
Original Interest Rate



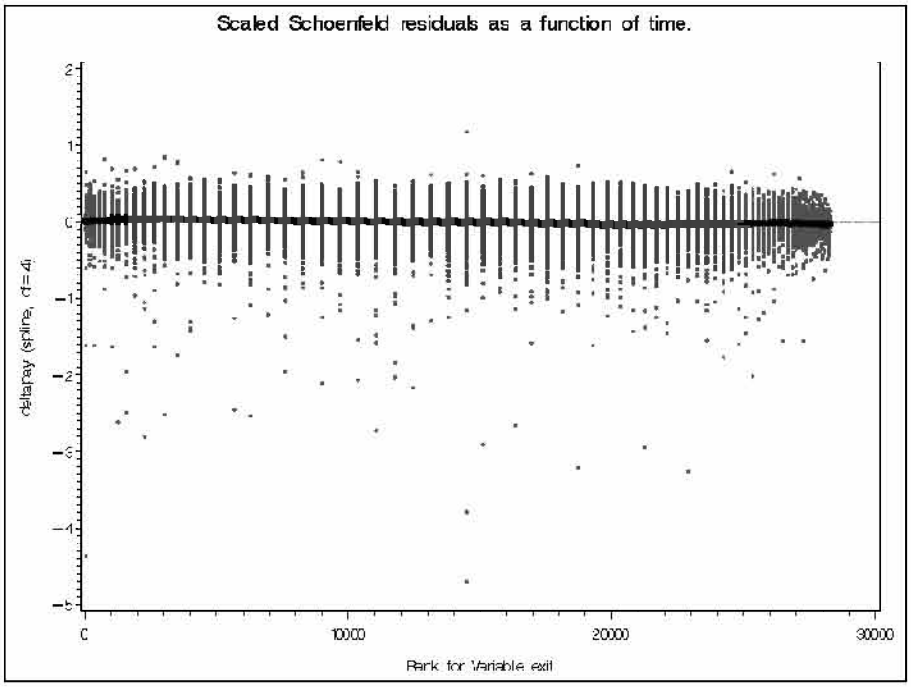
Rate Differential (t)



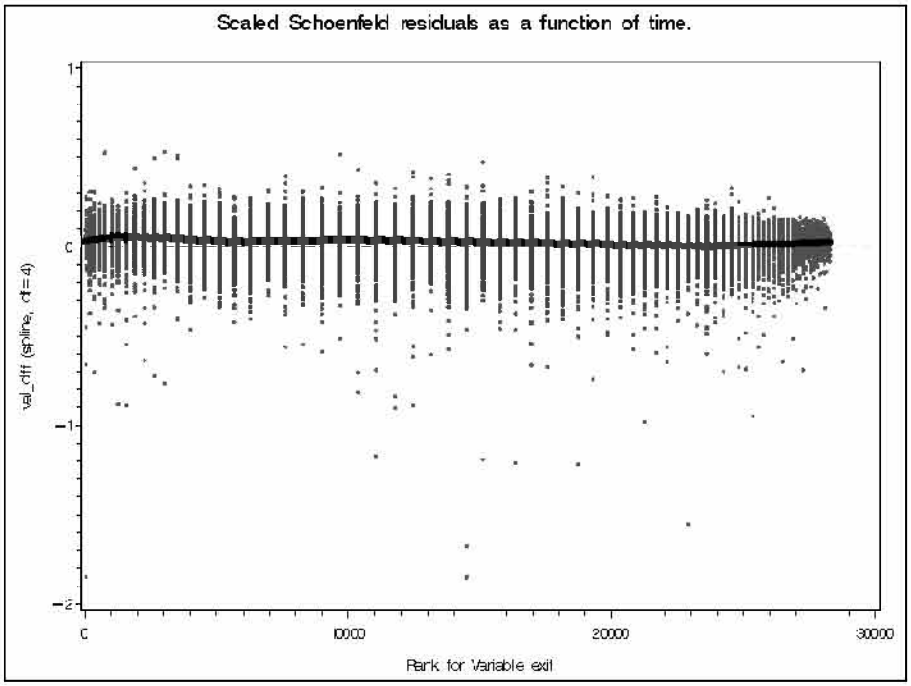
Original Payment



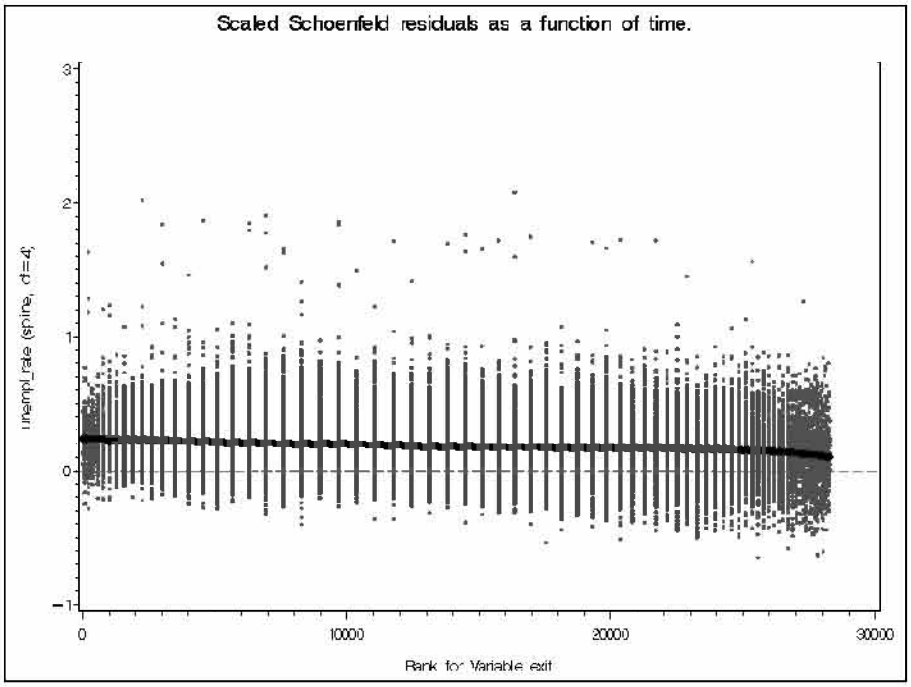
Change in Payment (t)



Change in Value (t)



Unemployment Rate (t)



Milliman

MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE INSURANCE LOAN PERFORMANCE ANALYSIS
AS OF MARCH 31, 2011

Prepared by:
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MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE INSURANCE LOAN PERFORMANCE ANALYSIS
AS OF MARCH 2011

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MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE INSURANCE LOAN PERFORMANCE ANALYSIS
AS OF MARCH 2011

INTRODUCTION AND BACKGROUND

The Office of the Comptroller of the Currency, Treasury, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, the U.S. Securities and Exchange Commission, the Federal Housing Finance Agency, and the Department of Housing and Urban Development (the Agencies) are proposing rules to implement the credit risk retention requirements of section 15G of the Securities Exchange Act of 1934 (15. U.S.C. § 78o-11), as added by section 941 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. Section 15G generally requires the securitizer of asset-backed securities to retain not less than five percent of the credit risk of the assets collateralizing the asset-backed securities. Section 15G includes a variety of exemptions from these requirements, including an exemption for asset-backed securities that are collateralized exclusively by residential mortgages that meet the definition of a "qualified residential mortgage" (QRM) as such term is defined by the Agencies. Section 15G directs the Agencies to define jointly what constitutes a QRM, taking into consideration underwriting and product features that historical loan performance data indicate result in a lower risk of default. In March 2011 the Agencies issued a report outlining the proposed definition of a QRM; the report provided a number of questions on the proposed definition of a QRM for which the agencies are seeking comments.

As required by section 15G, the Agencies considered information regarding the credit risk mitigation effects of mortgage guarantee insurance or other credit enhancements obtained at the time of origination. According to the QRM proposal, "the Agencies considered a variety of information and reports related to such guarantees and other credit enhancements. While this insurance protects creditors from losses when borrowers default, the Agencies have not identified studies or historical loan performance data adequately demonstrating that mortgages with such credit enhancements are less likely to default than other mortgages after adequately controlling for loan underwriting or other factors known to influence

credit performance, especially considering the important role of LTV ratios in predicting default. Therefore, the Agencies are not proposing to include any criteria regarding mortgage guarantee insurance.. "

Further in the proposal, "The Agencies seek comment on whether mortgage guarantee insurance or other types of insurance or credit enhancement obtained at the time of origination would or would not reduce the risk of default of a residential mortgage that meets the proposed QRM criteria but for a higher adjusted LTV ratio." This report intends to address the issue of whether or not mortgage guarantee insurance at loan origination has an influence on borrower default rates This report investigates performance differences between loans with and without mortgage insurance at loan origination.

SCOPE OF ANALYSIS

Mortgage Insurance Companies of America (MICA) engaged Milliman to analyze performance differences in insured mortgage loans versus uninsured mortgage loans. Specifically, Milliman has been asked to use statistical methods to investigate the hypothesis that insured loans and uninsured loans perform differently when controlling for other influential variables. The purpose of this study is to assess whether loans with mortgage insurance at origination have a lower incidence of default than uninsured loans. To do this, Milliman analyzed loan-level data from Corelogic's LoanPerformance Loan Level Servicing Database with logistic regressions of default performance and compared the modeled coefficients of insured and uninsured loans. Milliman analyzed five different loan populations to investigate the qualitative and quantitative robustness of the model indications. The loan populations vary by insurance type, underwriting characteristics, and original investor. This allowed Milliman to investigate performance differences between insured and uninsured loans and to specifically probe a question posed by MICA with regard to performance differences in loans that meet the proposed QRM definition but for higher combined loan-to-value (CLTV) ratios.

This report presents the results of our analysis.

EXECUTIVE SUMMARY

The purpose of this study is to assess whether loans that are similar in every aspect except for the presence of mortgage insurance at origination have a lower incidence of default than uninsured loans for loans that meet the proposed QRM definition but for higher combined LTV. Milliman invoked a multivariate modeling approach to control for characteristics besides insurance presence and investigate performance differences between groups of loans with and without mortgage insurance. Milliman's results generally indicate loans with mortgage insurance at origination have historically been associated with a lower rate of default when compared to similar loans without mortgage insurance, after controlling for influential underwriting characteristics and economic trends.

Milliman utilized CoreLogic's LoanPerformance Loan Level Servicing Database (Corelogic Data) for this analysis. The Corelogic Data contains loan-level underwriting characteristics and monthly performance history for prime mortgage loans, as determined by Corelogic, beginning with performance data in 1998. Milliman filtered the data as described in the data section of this report to produce a robust dataset of performance history for each loan. Milliman applied additional loan level filters to the data to produce a final clean dataset useful for comparing the relative default performance of insured loans against uninsured loans. Using the filtered dataset, Milliman performed various regressions[1] to develop a statistical comparison of the relative default incidence for uninsured loans versus insured loans that controls for both underwriting characteristics and economic conditions.

Milliman analyzed five different loan populations to investigate the qualitative and quantitative robustness of the model indications. A description of the five different loan populations is provided in Table 1:

[1] All of the regressions discussed in this study are logistic regressions

Table 1 Loan Population Summary					
Population	Description	Excludes FHA Loans[2]	Excludes GT95 CLTV[3]	Meets proposed QRM definition (except for LTV and DTI limits)[4]	Excludes GSE Investor Loans[5]
1	All loans in the data after applying the data filers described in the data section of this report	No	No	No	No
2	All loans excluding FHA and GT95 CLTV	Yes	Yes	No	No
3	QRM loans excluding FHA and GT95 CLTV	Yes	Yes	Yes	No
4	All loans excluding FHA, GT95 CLTV, and GSE	Yes	Yes	No	Yes
5	QRM loans excluding FHA, GT95 CLTV, and GSE	Yes	Yes	Yes	Yes

Table 2 below provides the loan count for each population for both terminated and active loans and terminated loans only. Terminated loans are loans that have paid off either through early repayment, foreclosure, repossession, or by any other means; active loans are loans that have not terminated.

Table 2 Loan Count Summary by Population		
Population	Terminated and Active Loans	Terminated Loans Only
Population 1 – All loans in the data	6,045,900	3,365,360
Population 2 – All loans excluding FHA and GT95 CLTV	4,380,969	2,495,367
Population 3 – QRM loans excluding FHA and GT95 CLTV	1,110,159	618,357
Population 4 – All loans excluding FHA, GT95 CLTV, and GSE	1,500,352	998,173
Population 5 – QRM loans excluding FHA, GT95 CLTV, and GSE	285,739	207,974

Population (1) allows investigation into performance differences between insured and uninsured loans in the entire loan population. That is, Population (1) does not filter for QRM requirements and uses all available data.

Population (2) removes from Population (1) FHA loans and loans with an initial CLTV greater than 95%. Loans insured by the Federal Housing Administration (FHA Loans) are considered insured loans for this

[2] An "FHA Loan" is any loan insured by the Federal Housing Administration or any loan purchased by Ginnie Mae
[3] "GT95 CLTV" corresponds to any loan where the initial combined loan-to-value ratio on the loan is greater than 95%
[4] "DTI" = Debt-to-income ratio
[5] "GSE Investor Loans" correspond to any loan purchased by either Freddie Mac or Fannie Mae

study. however, this insurance is provided by the government. A purpose of our study is to determine performance differences between privately insured and uninsured loans. Since a majority of FHA Loans are concentrated in the GT95 CLTV bucket, the remaining GT95 CLTV bucket is also removed from the population.

Population (3) removes from Population (2) loans that do not meet the proposed QRM criteria. Models based on Population (3) can be used to investigate performance differences between insured and uninsured loans that otherwise meet the proposed QRM criteria, excluding loans insured by the FHA and loans with an initial CLTV greater than 95%.

Population (4) removes from Population (2) loans purchased by the GSE's. During the period in which the studied loans were originated, in many instances the private mortgage insurance companies delegated approval authority to the GSE's and their automated underwriting systems. It is difficult to distinguish the impact of these underwriting systems from that of private mortgage insurance on those loans. Therefore, Milliman removed loans purchased by the GSEs within 3 months of origination from this loan population to investigate the impact the GSE purchased loans may have on results as compared to Population (2)

Population (5) removes from Population (4) loans that do not meet the proposed QRM criteria. Models based on Population (5) can be used to investigate performance differences between insured and uninsured loans for loans meeting the proposed QRM criteria but for higher CLTV when private mortgage insurers were allowed to independently underwrite (i.e. without following the automated underwriting systems of the GSEs) and provide loss mitigation.

To investigate performance differences (i.e. differences in default rates) between insured and uninsured loans Milliman first compared the actual default rates on loans with mortgage insurance to loans without mortgage insurance. This comparison suggested that loans with mortgage insurance have historically

had lower default rates than loans without mortgage insurance for similar loan cohorts. Default rates for each cohort are provided in the Tables 3 through 7 starting on page 9.

Quantitative analysis was performed separately on each of the 5 loan populations to explore the robustness of insured vs. uninsured loan performance results and to test important hypotheses regarding the observable impact of mortgage insurance on loan performance. For each loan population Milliman assigned each loan to one of four distinct sub-populations depending upon the home price appreciation (HPA) range from loan origination through the end of the evaluation period generating four separate models for each of the five loan populations.

To segment each population into insured and uninsured cohorts, Milliman created a combined explanatory variable in the regression using the original CLTV of each loan and an insurance indicator. For example, Milliman assigned each loan with a CLTV between 90 and 95 to one of two cohorts: "95 Insured" or "95 Uninsured". This allowed Milliman to directly compare groups of insured and uninsured loans by CLTV cohort by comparing the parameter estimates of the regression. If the parameter estimate for an insured loan is smaller than the parameter estimate for an uninsured loan for the same CLTV cohort, then the model indicates loans with mortgage insurance have a lower default incidence than uninsured loans for that cohort of loans all else equal. As a result of the regression model form Milliman used, the test statistic to quantify the difference between the uninsured and insured model parameters can be equivalently expressed as an arithmetic difference in the parameters or as a ratio of the exponentiated parameters (Odds). Milliman refers to the ratio of the exponentiated parameter estimates (Odds) for uninsured loans relative to insured loans as the Odds Relativity.[6] The Odds Relativity then measures the relative default incidence of uninsured loans relative to insured loans. For example, an Odds Relativity of 1.5 would indicate the odds of an uninsured loan defaulting is 1.5 times that of an insured loan, all else equal. Milliman applied statistical tests to determine if observed performance

[6] In this analysis, the Odds Relativity is a comparison of the parameter estimates of the uninsured parameter estimate relative to the insured parameter estimate for the same CLTV category. Mathematically, as Milliman used a logistic regression to calibrate the models described in this report, the Odds Relativity is equal to $e^{(\text{uninsured parameter estimate})}/e^{(\text{insured parameter estimate})}$. Odds in favor of an event are the probability of the event divided by the probability of the event complement, or p/(1-p).

differences between uninsured and insured loans are statistically significant at conventionally accepted levels.

For each population and each HPA range, Milliman performed the analysis twice. Once for loans terminated at the end of the evaluation period and once for loans that were either active or terminated as of the evaluation period (all loans). The evaluation period used for all analysis in this study is 20 quarters. A 20 quarter evaluation period implies that each loan is potentially observable for 20 quarters (through 5 years of loan age). Performance after 20 quarters is ignored and acts to provide a uniform maximum default exposure time for all loans in the study. Loans without at least 20 quarters of development time were excluded from the analysis therefore, the study includes loan originated between the years 2002 Q1 and 2006 Q1 as loans originated after 2006 Q1 do not have 20 quarters of development as of March 31, 2011. The tables below provide the results of Milliman's analysis for each loan population using the default definition of default and did not cure (Default_NC) as described in the text of this report.

Each table provides four statistics for each loan population and HPA range. The first statistic shown in the tables is the observed default rate on insured loans (Insured Default Rate) calculated as the number of defaults in the data divided by the number of loans for insured loans only. The second statistic shown is the observed default rate for uninsured loans (Uninsured Default Rate) calculated as the number of defaults in the data divided by the number of loans for uninsured loans only. The third statistic is the ratio of the uninsured default rate to the insured default rate: if this ratio is larger than 1, then based on historical default rates, insured loans default less frequently than uninsured loans. Finally, the fourth statistic in each table is the Odds Relativity (which measures the relative default incidence of uninsured loans relative to insured loans in a statistical framework as described above) and the associated statistical significance.

1) All loans:

Table 3 Population 1 : All Loans Origination Years 2002-2006 Modeled Default Rate: Default_NC						
	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	29.0%	30.8%	27.1%	30.4%	33.5%	30.3%
-20%<HPA<=0%	11.9%	12.1%	14.4%	10.9%	10.9%	16.7%
0%<HPA<=20%	5.7%	5.9%	9.5%	5.8%	6.1%	11.7%
20%<HPA	2.7%	3.3%	6.2%	2.7%	3.4%	6.7%
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	45.0%	43.5%	53.1%	53.8%	59.5%	68.2%
-20%<HPA<=0%	19.2%	16.8%	27.9%	19.7%	18.4%	30.9%
0%<HPA<=20%	7.8%	7.1%	18.5%	8.6%	8.0%	18.8%
20%<HPA	3.0%	3.3%	13.8%	3.8%	3.9%	15.5%
HPA Range	**Ratio of Uninsured to Insured Default Rate**			**Ratio of Uninsured to Insured Default Rate**		
HPA<=-20%	1.55	1.41	1.96	1.77	1.77	2.25
-20%<HPA<=0%	1.61	1.38	1.94	1.80	1.69	1.86
0%<HPA<=20%	1.37	1.20	1.95	1.48	1.33	1.61
20%<HPA	1.13	1.01	2.24	1.41	1.13	2.30
HPA Range	**Modeled Odds Relativity***			**Modeled Odds Relativity***		
HPA<=-20%	1.20	1.25	1.84	1.94	1.81	2.18
-20%<HPA<=0%	1.33	1.36	2.22	1.53	1.37	1.70
0%<HPA<=20%	1.41	1.49	2.47	1.45	1.40	1.97
20%<HPA	1.43	1.33	2.28	1.60	1.31	2.38

*Each result significant at the 0.001 level

For all of the cohorts in Table 3 (and for the remaining tables that follow) the empirical default rate is consistent with the expectation that negative HPA environments are associated with higher default rates and positive HPA environments are associated with lower default rates. Within the CLTV 90 cohort (an initial CLTV between 80% and 90%) for uninsured loans, the default rate for the lowest HPA range is 45.0% while the default rate for the highest HPA range is 3.0%.

For Population (1), insured loans have a lower empirical default rate within all of the HPA and CLTV cells for all loans (i.e. active and terminated loans) and terminated only loans. For example, the default rate for terminated and active uninsured loans for CLTV 90 with HPA of less than or equal to -20% after 20 quarters of development was 45.0%. This compares to a default rate for the similar cohort of insured loans of 29.0%. The empirical default relativity for this cohort was 1.55 (1.55 = 0.45 / 0.29). The empirical odds relativity for this cohort was 2.00 (2.00 = [(0.45/(1-0.45)] / [0.29/(1-0.29)].

A disadvantage of using a one-way analysis of empirical rates like what was just described is that when the two groups being compared differ in ways other than the segmenting characteristic it is difficult to justify that observed differences are due to the segmenting characteristic and not some other difference between the groups that was not considered. To control for important risk characteristics known to influence default rates besides CLTV range and home price change environment, Milliman fit logistic regression models to the loan level data. Milliman then computed the Odds Relativity to compare the relative default incidence of insured loans to uninsured loans, all else equal. For each of the cohorts listed in Table 3, the Odds Relativity of uninsured loans to insured loans is greater than one and is significant at the 0.1% level.

2) All loans in the filtered dataset excluding Federal Housing Administration (FHA)-insured loans and excluding loans with a CLTV above 95%:

Table 4
Population 2 : All Loans Excluding FHA-Insured Loans and Loans with a CLTV Above 95%
Origination Years 2002-2006
Modeled Default Rate: Default_NC

	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	30.4%	32.1%	NA	32.3%	35.2%	NA
-20%<HPA<=0%	12.5%	12.8%	NA	11.6%	11.4%	NA
0%<HPA<=20%	5.7%	5.7%	NA	5.8%	5.6%	NA
20%<HPA	2.4%	2.9%	NA	2.3%	2.8%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	45.0%	43.5%	NA	53.8%	59.5%	NA
-20%<HPA<=0%	19.2%	16.8%	NA	19.7%	18.4%	NA
0%<HPA<=20%	7.8%	7.1%	NA	8.6%	8.0%	NA
20%<HPA	3.0%	3.3%	NA	3.8%	3.9%	NA
HPA Range	**Ratio of Uninsured to Insured Default Rate**			**Ratio of Uninsured to Insured Default Rate**		
HPA<=-20%	1.48	1.35	NA	1.67	1.69	NA
-20%<HPA<=0%	1.53	1.31	NA	1.70	1.62	NA
0%<HPA<=20%	1.36	1.24	NA	1.50	1.45	NA
20%<HPA	1.27	1.15	NA	1.69	1.39	NA
HPA Range	**Modeled Odds Relativity***			**Modeled Odds Relativity***		
HPA<=-20%	1.12	1.16	NA	1.78	1.63	NA
-20%<HPA<=0%	1.14	1.12	NA	1.29	1.10	NA
0%<HPA<=20%	1.18	1.22	NA	1.17	1.13	NA
20%<HPA	1.25	1.19	NA	1.32	1.12	NA

* Each result significant at the 0.001 level except in the two cases discussed below.

When FHA loans and loans with a CLTV above 95% are removed from the data the empirical insured default rate, in general, increases for HPA ranges less than 0 and decreases for HPA ranges greater than 0 relative to the default rate in Population (1). The uninsured loan population does not change from Population (1) for loans with a CLTV less than 95% as FHA loans are categorized as insured loans in this analysis. Removing FHA loans from the data does not affect the uninsured loan population.

For the second population of loans, all of the empirical default ratios of uninsured loans to insured loans and the Odds Relativities are greater than one and are significant at the 0.1% level, with the exception of the -20% < HPA <=0% which has a p-value of 0.2% and the 20%<HPA range which has a p-value of 5.0% for the terminated loans only in the CLTV 95 group (reference Exhibit 3, Page 10). These results indicate that for this population of loans, insured loans have historically had a lower default rate than uninsured loans, all else equal.

3) Only loans meeting the proposed QRM definition with the exception of loan-to-value (LTV) and debt-to-income (DTI) requirements, excluding FHA loans and excluding loans with a CLTV above 95%:

Table 5 Population 3 : QRM Loans Only Excluding FHA-Insured Loans and Loans with a CLTV Above 95% Origination Years 2002-2006 Modeled Default Rate: Default_NC						
	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	17.5%	19.1%	NA	20.1%	21.1%	NA
-20%<HPA<=0%	5.8%	5.5%	NA	4.7%	4.9%	NA
0%<HPA<=20%	1.9%	1.8%	NA	1.7%	1.6%	NA
20%<HPA	0.9%	1.0%	NA	0.9%	1.1%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	16.5%	19.2%	NA	33.4%	40.9%	NA
-20%<HPA<=0%	5.1%	5.9%	NA	6.0%	6.2%	NA
0%<HPA<=20%	1.8%	2.0%	NA	2.8%	2.8%	NA
20%<HPA	0.6%	0.8%	NA	1.3%	1.4%	NA
HPA Range	**Ratio of Uninsured to Insured Default Rate**			**Ratio of Uninsured to Insured Default Rate**		
HPA<=-20%	0.94	1.01	NA	1.66	1.94	NA
-20%<HPA<=0%	0.89	1.06	NA	1.27	1.27	NA
0%<HPA<=20%	0.92	1.11	NA	1.62	1.70	NA
20%<HPA	0.69	0.81	NA	1.47	1.28	NA
HPA Range	**Modeled Odds Relativity (Significance)**			**Modeled Odds Relativity (Significance)**		
HPA<=-20%	0.98 (0.730)	1.00 (0.986)	NA	1.84 (<0.001)	2.28 (<0.001)	NA
-20%<HPA<=0%	1.02 (0.762)	1.01 (0.873)	NA	1.25 (0.024)	1.05 (0.659)	NA
0%<HPA<=20%	1.10 (0.184)	1.12 (0.103)	NA	1.46 (<0.001)	1.33 (0.010)	NA
20%<HPA	0.84 (0.134)	0.87 (0.242)	NA	1.26 (0.375)	1.08 (0.744)	NA

Population (3) is identical to Population (2) with the exception that the proposed QRM underwriting requirements are applied to the loans (except for LTV and DTI requirements). The empirical default rates and Odds Relativities for Population (3) cohorts are notably lower and more similar in magnitude than comparable figures for Population (2). This is consistent with expectations since the qualifying characteristics for population inclusion are more narrowly defined by levels associated with less risky loans, for example, no FICO less than 690. For terminated and active loans, the Odds Relativities show little difference between insured and uninsured loans, with all results insignificant at the 10% level except for the CLTV 95 cohort in the 0%<HPA<=20% range (which indicates insured loans perform better).

When looking at only terminated loans, the empirical default rate ratio of uninsured to insured default rates do indicate insured loans have a lower default incidence than uninsured loans. The empirical observation is supported by the Odds Relativity for all cohorts, most of which are significant at the 10% level.

4) All loans in the filtered dataset excluding FHA loans, loans with a CLTV greater than 95%, and excluding government-sponsored enterprise (GSE) loans:

Table 6
Population 4 : All Loans Excluding FHA-Insured Loans, Loans with a CLTV Above 95%, and GSE Purchased Loans
Origination Years 2002-2006
Modeled Default Rate: Default_NC

	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	33.6%	36.1%	NA	29.1%	30.5%	NA
-20%<HPA<=0%	12.9%	13.7%	NA	8.9%	9.2%	NA
0%<HPA<=20%	6.0%	6.4%	NA	5.2%	4.8%	NA
20%<HPA	3.0%	3.4%	NA	2.8%	2.9%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	48.8%	51.9%	NA	54.3%	62.9%	NA
-20%<HPA<=0%	24.9%	23.6%	NA	24.7%	24.2%	NA
0%<HPA<=20%	11.9%	12.5%	NA	12.6%	12.0%	NA
20%<HPA	4.9%	7.5%	NA	6.8%	8.7%	NA
HPA Range	**Ratio of Uninsured to Insured Default Rate**			**Ratio of Uninsured to Insured Default Rate**		
HPA<=-20%	1.45	1.43	NA	1.86	2.06	NA
-20%<HPA<=0%	1.93	1.72	NA	2.77	2.63	NA
0%<HPA<=20%	1.97	1.96	NA	2.40	2.51	NA
20%<HPA	1.62	2.24	NA	2.38	3.01	NA
HPA Range	**Modeled Odds Relativity***			**Modeled Odds Relativity***		
HPA<=-20%	1.30	1.41	NA	2.23	2.09	NA
-20%<HPA<=0%	1.43	1.38	NA	2.07	1.54	NA
0%<HPA<=20%	1.42	1.44	NA	1.61	1.52	NA
20%<HPA	1.36	1.48	NA	1.53	1.64	NA

* Each result significant at the 0.001 level

Population (4) removes from Population (2) loans purchased by the GSE's within a three month time period from origination. For Terminated and Active loans, the default rates are greater for both insured and uninsured loans relative to Population (2). The simple average of the default rates for all insured cohorts across all HPA ranges is 13.3% for Population (2) and 14.4% for Population (4). The simple

average of the default rates for all uninsured cohorts across all HPA ranges is 18.2% for Population (2) and 23.2% for Population (4). Both the empirical ratio and Odds Relativity for uninsured default rates relative to insured default rates is greater than 1 for all HPA ranges and CLTV cohorts. and the Odds Relativity is highly significant.

For terminated loans only, the simple average of the default rates for all insured cohorts across all HPA ranges is 13.3% for Population (2) and 11.7% for Population (4). The simple average of the default rates for all uninsured cohorts across all HPA ranges is 22.0% for Population (2) and 25.8% for Population (4). Both the empirical ratio and Odds Relativity for uninsured default rates relative to insured default rates is greater than 1 for all HPA ranges and CLTV cohorts. and the Odds Relativity is highly significant.

5) Only loans meeting the proposed QRM definition with the exception of loan-to-value (LTV) and debt-to-income requirements, excluding FHA loans, loans with a CLTV greater than 95%, and excluding government-sponsored enterprise (GSE) loans:

Table 7 Population 5 : QRM Loans Only Excluding FHA-Insured Loans, Loans with a CLTV Above 95%, and GSE Purchased Loans Modeled Default Rate: Default_NC						
	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	16.1%	17.2%	NA	12.2%	12.5%	NA
-20%<HPA<=0%	4.7%	4.9%	NA	2.6%	3.4%	NA
0%<HPA<=20%	1.9%	1.8%	NA	1.6%	1.6%	NA
20%<HPA	1.7%	1.6%	NA	1.9%	1.7%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	18.0%	25.1%	NA	30.5%	40.8%	NA
-20%<HPA<=0%	5.8%	8.1%	NA	5.7%	7.3%	NA
0%<HPA<=20%	2.2%	2.9%	NA	2.9%	3.5%	NA
20%<HPA	0.6%	1.1%	NA	0.9%	1.4%	NA
HPA Range	**Ratio of Uninsured to Insured Default Rate**			**Ratio of Uninsured to Insured Default Rate**		
HPA<=-20%	1.12	1.46	NA	2.49	3.26	NA
-20%<HPA<=0%	1.24	1.65	NA	2.22	2.14	NA
0%<HPA<=20%	1.17	1.58	NA	1.80	2.19	NA
20%<HPA	0.32	0.68	NA	0.50	0.79	NA
HPA Range	**Modeled Odds Relativity (Significance*)**			**Modeled Odds Relativity (Significance*)**		
HPA<=-20%	1.20 (0.088)	1.43 (0.012)	NA	2.54	3.78	NA
-20%HPA<=0%	1.49	1.45 (0.003)	NA	2.36	1.91 (0.001)	NA
0%<HPA<=20%	1.31 (0.017)	1.44 (0.005)	NA	1.83 (0.002)	1.84 (0.001)	NA
20%<HPA	0.48	0.84 (0.381)	NA	0.41 (0.134)	0.61 (0.420)	NA

*Unless otherwise shown, result significant at 0.001 level

Finally, in Population (5) Milliman applied the proposed QRM restrictions to the loans in Population (4). Similar to Population (3), the default rate for Population (5) is lower than Population (4). However unlike Population (3), once GSE loans are removed from the data, the relative performance of insured loans in this population have historically demonstrated lower default rates than comparable uninsured loans, with the exception of periods of instances where home prices have appreciated by more than 20% over a five year period. In addition, the Odds Relativity is greater than 1 for all HPA categories and is significant in many instances at the 1% level. The exception is the greater than 20% HPA range where for three of the four possible CLTV cohorts the results are not statistically significant at the 10% level.

Milliman's results generally indicate loans with mortgage insurance at origination have historically been associated with a lower rate of default when compared to similar loans without mortgage insurance, after controlling for influential underwriting characteristics and economic trends. This result is consistent across the five loan populations reviewed for this study. Loans with mortgage insurance showed the largest and most significant differences from uninsured loans in the negative HPA ranges. When applying the proposed QRM filters with the exception of LTV and DTI requirements, the results support the position that, if private mortgage insurance companies are not subject to pre-defined underwriting systems, loans with private mortgage insurance default at a lower rate than comparable loans without mortgage insurance.

The results are generally stronger and more significant in the terminated only loan populations when compared to the terminated and active loan populations. For the terminated only subset of loans, the ultimate performance of each loan is known as of the evaluation period of 20 quarters, which possibly imparts more stability in discerning statistical differences than the all loans models at any given evaluation period by reducing sample size and variation.

DATA USED IN ANALYSIS

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 2011 (the last month of observation for this study is March 2011). 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 gives 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; and
- We next removed any loans where the Active Status fluctuated between Active and Closed. Changes in this status from Active to Closed in the performance can be triggered by delinquency statuses of 'S' or 'T' (Servicing sold released, Loan status no longer provided/available, respectively) where, in subsequent periods, the statuses are not 'S' or 'T' and, thus, the status reverts from Closed back to Active. Our interest was in the "well defined" history which would not include loans such as these that have missing months of data.

The resulting dataset then contained various 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 ultimate purpose of this study is to assess whether loans with mortgage insurance at origination have a lower incidence of default than uninsured loans for loans that meet the proposed QRM definition but for higher combined LTV ratios. Therefore, Milliman applied the following additional filters on the data:

Loans included in analysis:

- First lien loans;
- 1-4 Family property types;
- Loans with a combined loan-to-value ratio at origination inclusively between 80 and 105;
- Loans originated between 2002 Q1 and 2006 Q1;
- Loans with a first lien LTV equal to or greater than 80%;
- Loans with a CLTV greater than 80% and no insurance (Uninsured loans); and
- Loans with a first lien LTV greater than 80% and private mortgage insurance (Insured loans).

Loans excluded from analysis:

- Second lien or greater loans;
- Commercial, 5+ Unit, Co-op, mixed-use, and unknown property types;
- Loans with a missing FICO score; and
- Loans with an amortization type that is invalid or unknown.

Milliman appended home price appreciation data to the loan-level database using the Federal Housing Finance Agency (FHFA) home price indices at the metropolitan statistical area (CBSA) with actual home price indices as of December 31, 2010. Milliman relied on Moody's Economy.com home price index forecasts to extrapolate from the December 31, 2010 actual index values through March 31, 2011 where applicable.

Description of the Five Loan Populations

Milliman analyzed five different loan populations from the final dataset to investigate the qualitative and quantitative robustness of the model indications. The five different loan populations are:

1) All loans in the filtered dataset

This scenario covered all high LTV insured loans in addition to high LTV uninsured loans. The regression equations used in this scenario include underwriting variables to control for the impact of risky underwriting characteristics such as documentation type, loan term, interest only indicators, negative amortization indicators, etc. A complete list of the underwriting variables in the regression can be found in the "Description of Regression Model" section. A majority of the high LTV uninsured loans are piggyback loans.

2) All loans in the filtered dataset excluding Federal Housing Administration (FHA)-insured loans and excluding loans with a CLTV above 95%.

One question raised in the proposed QRM definition is whether or not the presence of mortgage insurance itself reduces the incidence of default. FHA-insured loans are explicitly excluded from the proposed risk-retention requirements of the Dodd-Frank Act. In addition, loans insured by the FHA must follow the underwriting guidelines, originator oversight, and servicer oversight set by the FHA. In order to provide a clean comparison of the relative default incidence of privately insured loans (which must follow the specifications of the private mortgage insurer) against uninsured loans, Milliman removed FHA-insured loans from the population.

After reviewing the remaining loan population of loans not insured by the FHA, Milliman also removed loans with a CLTV of greater than 95%. Milliman removed this segment of loans from the study because:

a) FHA-insured loans are concentrated in the greater 95% CLTV category,
b) Loans with a CLTV greater than 95% represents business that is unlikely to be written going forward, particularly for loans that meet the final definition of a QRM.

3) Only loans meeting the proposed QRM definition with the exception of loan-to-value (LTV) and debt-to-income (DTI) requirements, excluding FHA loans and excluding loans with a CLTV above 95%

The regulators issuing the proposed QRM definition issued a request to determine whether or not the presence of mortgage insurance itself at the time of origination reduces the incidence of default *for loans that meet the proposed QRM criteria but for a higher adjusted LTV ratio*. Therefore, Milliman filtered the data for the proposed QRM requirements as described in the data section of this report. DTI filters were not applied due to the lack of data and reliability of DTI ratios in the data used for this study[7].

[7] For the loan population used in this study, approximately 50% of the observations were missing a debt-to-income ratio. Upon further review it was determined loans missing a DTI were not randomly distributed among the loan population.

4) All loans in the filtered dataset excluding FHA loans, loans with a CLTV greater than 95%, and excluding government-sponsored enterprise (GSE) loans.

During the period in which the studied loans were originated, the private mortgage insurance companies delegated approval authority to the 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. Therefore, Milliman removed loans purchased by the GSEs within 3 months of origination for this loan population to test the resulting impact of the analysis against the results of the analysis of Population (2).

5) Only loans meeting the proposed QRM definition with the exception of loan-to-value (LTV) and debt-to-income requirements, excluding FHA loans, loans with a CLTV greater than 95%, and excluding government-sponsored enterprise (GSE) loans.

For the last population of loans, Milliman applied the QRM filters to the loan population described in Population (4). The regulators issuing the proposed QRM definition issued a request to determine whether or not the presence of mortgage insurance itself at the time of origination reduces the incidence of default *for loans that meet the proposed QRM criteria but for a higher adjusted LTV ratio.* As GSE loans are also excluded from risk retention requirements, and the GSEs also have specific underwriting and servicing requirements, Milliman removed GSE loans from the population to provide a clean comparison of the relative default incidence of privately insured loans (which must follow the specifications of the private mortgage insurer) against uninsured loans.

Description of the QRM Filter

Milliman filtered the underwriting data to meet the definition of a QRM per the proposed definition from the Agencies with the exception of filters for debt-to-income ratios and loan-to-value (LTV) ratios. Milliman did not filter on debt-to-income ratios due to the lack of data availability and reliability for this field; for example, approximately 50% of the observations under the proposed QRM definition were missing a DTI ratio. Milliman did not filter on loan-to-value ratios as mortgage insurance is typically provided for high LTV loans. The purpose of this study is to assess whether loans with mortgage insurance at origination have a lower incidence of default than uninsured loans for loans that meet the proposed QRM definition but for higher combined LTV ratios.

To define the loan population meeting the QRM proposal, Milliman applied additional filters to the loan level origination data to include only loans meeting the following proposed QRM requirements.

Loans included in the proposed QRM definition:

- Adjustable-rate mortgages with an annual maximum rate reset of less than or equal to 2 percentage points and a lifetime maximum rate reset of less than or equal to 6 percentage points;
- Loans with an amortization period equal to or less than 360 months;
- Full documentation loans;
- Loans with an occupancy type of primary residence / owner occupied; and
- Loans with a FICO score between 690 and 850.

Loans excluded from the proposed QRM definition:

- Interest-only loans;
- Loans with a balloon payment;
- Negative amortization loans; and
- Loans with a prepayment penalty.

Loan Counts for Each Population

The loan count for each population used in this study is summarized in Table 8 below.

Table 8
Loan Count Summary by Population

Population	Terminated and Active Loans	Terminated Loans Only
Population 1 – All loans in the data	6,045,900	3,365,360
Population 2 – All loans excluding FHA and GT95 CLTV	4,380,969	2,495,367
Population 3 – QRM loans excluding FHA and GT95 CLTV	1,110,159	618,357
Population 4 – All loans excluding FHA, GT95 CLTV, and GSE	1,500,352	998,173
Population 5 – QRM loans excluding FHA, GT95 CLTV, and GSE	285,739	207,974

APPROACH TO ANALYSIS

To assess whether loans with mortgage insurance (MI) perform differently than uninsured loans with respect to default incidence, Milliman first reviewed the empirical default rates of the various cohorts according to the default definitions and cohorts described below. The empirical default rates provide an approximation of the relative default frequency of insured loans relative to uninsured loans. However, the empirical default rates may not provide controlling factors for the observed performance difference such as home price appreciation and underwriting characteristics. For example, the insured population may have less concentration in low documentation loans for Population (1) relative to uninsured loans, and the difference in the low documentation concentration may contribute more to the performance difference than the presence of mortgage insurance.

Description of the Logistic Regression

In order to control for such potential differences, Milliman performed logistic regressions on the Corelogic Data using a combination of underwriting data and home price appreciation categories. Milliman performed the analysis at 20 quarters of development[9]. Fixing the development period creates a homogeneous set of data across loan origination years with respect to the time duration of exposure to default: this methodology was used because cumulative loan default probabilities increase monotonically with time. Furthermore, the ultimate resolution of every loan in this study is not yet known. A mortgage loan will, at ultimate development, either terminate due to default or pay the mortgage in full through the amortization schedule of the mortgage or through early repayment. An ultimate default rate can only be known once all loans in the population are terminated. Therefore, we defined cumulative default rates as of a specific development period, i.e. 20 quarters of development, to control for time. This allowed us to compare the model results for differently defined default horizons and ensure that loans in a given model were exposed to default hazard for equal amounts of time.

[9] The study therefore includes loans originated from 2002 through 2006. Preliminary analyses inclusive of the 2007 book at 16 quarters of development show similar results to those obtained in this study.

The home price appreciation (HPA) environment that a borrower is subject to affects the value of the collateral behind each loan, which impacts both a borrowers' ability to refinance a loan and willingness to repay a loan. For each loan, Milliman associated an HPA measure for the metropolitan area or state in which the loan was located during the development period of the data considered. Borrowers who are not able to repay their mortgage through refinancing (possibly due to negative equity or due to the lack of available credit) present a greater default incidence than a similar loan that is able to refinance. Borrowers who face large declines in the value of their property have a greater propensity to default on their mortgages than borrowers who face large increases in the value of their property, all else equal.

After consideration of the exceptional rise and subsequent decline in home prices and the corresponding performance of mortgage loans over the time period utilized for this analysis, Milliman believes the relationships between the dependent variables in this analysis and the corresponding independent underwriting loan variables may not be constant across the diverse HPA environments experienced in the United States. This presents a modeling problem because any single statistical model relies on the assumption presented in its equation that the relationship between a dependent and independent variable can be characterized in part with a constant parameter. Specifically the assumption is that the parameter for the independent variable is an estimate of the "true" constant coefficient. If that "true" constant is not constant but in fact variable over the range of data considered, then the results of a model that assumes otherwise are questionable. One approach to deal with this problem is to build models for each cohort by segmenting the data into smaller ranges with respect the "controlling" variable in question, here metropolitan HPA.

For this particular analysis, Milliman treated HPA as a segmenting variable and subsetted the data according to distinct home price appreciation ranges. Specifically, Milliman grouped the loans according to the cumulative HPA categories after 20 quarters of development: HPA $\leq$ -20%, -20% < HPA $\leq$ 0%, 0 < HPA $\leq$ 20%, and 20% < HPA.

An alternative to segmenting the data by HPA would be to introduce HPA as a right hand side (RHS) variable. Milliman believes its approach to segment the loans into distinct HPA environments allows for a better understanding of the relationships between the dependent variables and independent underwriting variables in each model without sacrificing the explanatory power of the underwriting variables to the HPA environment of each loan. Model comparisons of insured versus uninsured loans are then made between cohorts of loans that were subject to similar HPA environments.

Description of the Datasets Used in the Analysis

For each defined loan population, Milliman created four datasets corresponding to four distinct HPA environments. The cumulative HPA categories after 20 quarters of development are: HPA ≤ -20%, -20% < HPA ≤ 0%, 0 < HPA ≤ 20%, and 20% < HPA.

Milliman calculated cumulative home price appreciation using metropolitan and state FHFA home price indices. If the property was located in a Core Based Statistical Area (CBSA), Milliman used the HPA for the CBSA. If the property was not located in a CBSA then Milliman used the state home price index to calculate cumulative home price appreciation. For each loan, Milliman calculated the home price appreciation at the end of 20 quarters of development. For example, for a loan originated in the first quarter of 2002, Milliman calculated HPA for that loan as the percentage change in the relevant home price index from the first quarter of 2002 through the first quarter of 2007 (20 quarters). HPA was calculated from loan origination date to the development age of 20 quarters for each loan, regardless of whether or not the loan terminated prior to the development age. Milliman did this to avoid measuring HPA at different times of development for different loans within the evaluation period. Milliman believes this method identifies the HPA environment in which the loan existed for model segmentation purposes.

Milliman performed analysis on:

1. populations of loans that are still active or terminated at the evaluation horizon; and
2. only loans have that terminated (i.e. full resolution of the loan is known) by the evaluation horizon.

For loans that have not terminated, the full performance history of the loan is not known; these loans may default in the future, may cure from a given delinquency status, and/or may repay their obligation in full.

A logistic regression models a binary dependent variable, usually with the signal of interest assigned an outcome of 1. For the models described in this analysis, the dependent variable is assigned a 1 if the loan has reached a pre-determined default status and a 0 otherwise. Since the data is not at ultimate, we defined default as of a given development age as discussed above. A nontrivial consideration is whether the models should be calibrated based on all loans or only those loans that have terminated by a given development age to evaluate whether insured loans perform differently than uninsured loans. If one is interested in the ultimate default rates for cohorts of loans, then the two data sets (all loans and terminated loans only) can be viewed as two distinct approximations. In order to provide a complete analysis of the independent variable relationships with the dependent variables, Milliman created a pair of data sets, one with all loans and one with only those loans that terminated as of the development age, for each HPA segment and calibrated a model based on each data set. Therefore, there are 8 distinct datasets for each population in this analysis (4 sets for the HPA segments * 2 sets for all loans (terminated and active loans) and terminated only loans, separately).

Description of Regression Models

For each regression model, Milliman used a stepwise selection procedure to determine which underwriting variables, in combination, were significant at the 10% level. The general equation form for the probability of a given response outcome in a logistic model is:

$P_i = e^{\sum \beta_i X_i} / (1 + e^{\sum \beta_i X_i})$, where the X_i are the independent covariates with β_i as their associated coefficients.

Below is a summary of the variables included in the stepwise procedure and Milliman's view regarding these loan characteristics and their effect on default frequency:

- *Amortization (Reference Level = Fixed, Other Levels = ARM)*: ARMs are subject to interest rate risk and potential payment fluctuations with the market. Potentially higher interest rates for ARM borrowers without a proportional increase in income create greater mortgage service obligations for the borrower and an increased probability of default. On the other hand potentially lower interest rates for ARM borrowers without a proportional decrease in income create a lower mortgage debt obligation for the borrower and a decreased probability of default. In addition, the initial interest rate on ARMs is typically lower than the interest rate of fixed rate mortgages; therefore, some borrowers tend to select an ARM to achieve a better qualifying debt ratio;

- *Combined Loan-to-Value:* Mortgages supported by a lower equity investment by the borrower are subject to greater risk of default due to the increased likelihood of a future negative equity position caused by a future negative home price shock. In addition, a lower initial equity investment by the borrower may indicate either a lack of financial resources by the borrower for a larger down payment or potentially an investor in the property trying to limit their initial exposure. Consequently, mortgages with a higher CLTV should be associated with a higher default rate. For this analysis Milliman combined loans into CLTV segments, in combination with other underwriting variables, to categorize the loans into insured and uninsured cohorts as explained below;

- *Documentation Type (Reference Level = Full, Other Levels = Low):* Mortgages made with reduced documentation are more likely to default than those with full documentation provided at closing. Additionally, mortgages with no documentation (i.e., no income or asset verification) have a significantly greater chance of defaulting when compared to a full documentation mortgage;

- *FICO score (Reference Level = 780-850, Other Levels = 350-579, 580-599, 600-619, 620-659, 660-689, 690-719, 720-749, 750-779)*: Borrowers with low FICO scores are deemed to present a greater credit risk, and therefore, a borrower with a low FICO score should be associated with a higher default frequency. The relationship between FICO score and default rates is a non-linear

relationship. Therefore, Milliman treated this variable as a categorical variable as opposed to a continuous variable for the model;

- *Insured versus Uninsured:* Milliman separated the loans into insured and uninsured loans. This segmentation was used, in combination with other underwriting variables, to categorize the loans into the groups explained below. The intent of the present analysis is to determine if the presence of mortgage insurance at origination lowers default incidence;

- *Interest Only/Negative Amortization (Reference Level = No, Other Levels = Yes):* It is believed that borrowers with mortgages that have payment options such as only paying interest (as opposed to paying principal and interest) or less than the required interest payment (negative amortization mortgages) present a greater credit risk; thus, these types of mortgages should exhibit higher default rates than comparable fully amortizing mortgages;

- *Investor type:* For certain parts of the analysis, Milliman separated the loans into GSE and Private (i.e. not GSE) investor groups. Milliman does not have an a priori view of the relative default frequency by investor type;

- *Loan purpose (Reference Level = Purchase, Other Levels = C/O Refi, R/T Refi):* Cash-out refinance loans can be indicative of financial stress on the borrower; therefore, these loans should be associated with a higher default frequency. Rate/term refinance loans should lower the debt service obligation of the borrower through better terms on the mortgage; therefore, these loans should be associated with a lower default frequency;

- *Occupancy type (Reference Level = O[wner], Other Levels = I[nvestor], S[econd], U[nknown]):* In the Corelogic data, properties are categorized as being occupied either by the owner of the property, owned as a second or vacation home, owned as an investment property, or the occupancy type is

unknown. In Milliman's experience, investor properties tend to have higher default rates than owner occupied properties and second homes;

- *Property type (Reference Level = SFR [Single Family Residence] , Other Levels = 2-4 U[nits], Condo):* Loans for 2-4 family homes and condos have exhibited a greater propensity for default when compared to single-family residences based on Milliman's experience; therefore, these loans should be associated with a higher default frequency;

- *Property value size (Reference Level = 2, Other Levels = 0, 1, 3, 4):* Each loan was assigned to a relative original property value size category based on the distribution of original property value sizes for each CBSA and origination year. To develop the original property value size categories Milliman looked at all loan originations in the Corelogic Data for origination years 2002 through 2008 by CBSA and origination year; Milliman determined original property value size quintiles for each geographic location by origination year. Milliman then assigned each loan to a quintile depending upon the size of the original property value of the loan, the location of the loan, and the origination year of the loan. The relationship between the relative original property value size and default rates tends to vary depending upon the loan's HPA environment;

- *Term (Reference Level = 360, Other Levels = <360, >360):* Mortgages with an original term less than 30 years can be representative of borrowers with greater financial resources and willingness to repay a mortgage over a shorter period than longer duration mortgages and consequently may be associated with lower default rates relative to 30 year mortgages. Similarly, mortgages with an original term greater than 30 years can be representative of borrowers with less financial resources to repay a mortgage over a shorter duration and consequently may be associated with higher default rates relative to 30 year mortgages; and

- *Source (Reference Level = Non-Retail, Other Levels = Retail, Correspond[ence], Other):* The origination source of a loan tends be a statistically significant variable in explaining loan default frequencies. Milliman categorized the origination source into four categories: retail, non-retail, correspondence, and other. A retail lender is a lender who originates loans (i.e. works with the potential borrowers to work out financing terms), underwrites the loan, and provides the funding for the mortgage. A non-retail lender is a lender classified as either a mortgage broker or wholesale lender. A mortgage broker works independently from lenders to connect borrowers with potential lenders. Once the broker connects a borrower with a potential lender, the lender may provide financing for the loan or may decide it does not want to accept the risk. A wholesale lender is a lender that works with mortgage brokers and other loans officers to originate loans; underwriting and processing are completed by the wholesale lender to determine if the borrower meets certain underwriting criteria. If underwriting criteria is met, the wholesale lender will provide funding; loans are typically sold to the secondary market shortly after origination. Finally, correspondence lenders are lenders that originate and fund loans for the purpose of selling the mortgages to a larger lender (known as the "sponsor"). Underwriting typically must follow the guidelines of the sponsor, and a single correspondent lender may have more than one sponsor. In Milliman's experience correspondence loans are associated with the highest default frequency.

Milliman created a field using the combined LTV ratio at origination and the insurance type fields. This single variable contains 7 distinct possibilities as shown below:

Table 9
Combined LTV and Insurance Type Variable List

	LTV	Insured (Yes or No)
1. 80 Uninsured	80%	No
2. 90 Uninsured	80%<CLTV<90%	No
3. 90 Insured	80%<CLTV<90%	Yes
4. 95 Uninsured	90%<CLTV<95%	No
5. 95 Insured	90%<CLTV<95%	Yes
6. GT95 Uninsured	95%<CLTV<105%	No
7. GT95 Insured	95%<CLTV<105%	Yes

The CLTV and insurance (CLTV_Insured) variables were grouped together in this manner to allow for different interactions between CLTV and insurance presence, so Milliman could specifically evaluate the impact of mortgage insurance for comparable CLTV and HPA categories

Milliman fit the logistic regressions to three separate independent response variables to assess the impact of the presence of mortgage insurance of loan default rates. The first regression was for the response variable of default where default is defined as a loan ever reaching 90 days delinquent or worse. In this regression Milliman analyzed the relative frequency of default for loans with mortgage insurance compared to similar loans without mortgage insurance, while controlling for underwriting and economic variables.

The second regression Milliman performed was on the response variable of a loan cure given a loan has reached 90 days delinquent or worse. A loan cure is defined as the loan ever reaching the current status subsequent to the loan becoming 90 days delinquent or worse. In this regression Milliman analyzed the relative frequency of loan cures for loans with mortgage insurance compared to similar loans without mortgage insurance, while controlling for underwriting and economic variables.

The final regression Milliman performed was for the response variable loan default with consideration of both loans cures and re-defaults. In this regression a loan default was defined as any loan that reached a 90 days delinquency status or worse and subsequently did not cure from the default. If a loan did cure, Milliman determined whether the loan re-defaulted; if the loan re-defaulted after the cure the loan was categorized as a default. The intent of this regression is to determine the impact of mortgage insurance on final loan defaults with consideration of default mitigation activities of the mortgage insurance companies. In this regression equation Milliman analyzed the relative frequency of loan defaults with consideration of loan cures and re-defaults for loans with mortgage insurance compared to similar loans without mortgage insurance, while controlling for underwriting and economic variables.

RESULTS OF ANALYSIS

Table 10 below provides a summary, in terms of loan counts, of the data used to calibrate the models described above for Population (1) using all loans (i.e. including active and terminated loans after 20 quarters of development) for loans with an original CLTV of 90. Exhibit 1 provides this information for each of the five loan populations for every CLTV for both all loan originations (i.e. terminated and active loans) and terminated loans only.

Table 10
Population 1 : All loans in the Filtered Database
CLTV 90
Terminated and Active Loans

	Uninsured			Insured		
	Default 90	Cure Given Default 90	Default_NC	Default 90	Cure Given Default 90	Default_NC
HPA Range	**Observed Loan Count**			**Observed Loan Count**		
HPA<=-20%	80,539	38,415	80,539	47,743	15,344	47,743
-20%<HPA<=0%	90,231	19,359	90,231	123,527	17,938	123,527
0%<HPA<=20%	92,784	8,883	92,784	308,605	23,053	308,605
20%<HPA	60,436	2,811	60,436	341,716	14,351	341,716
HPA Range	**Number of Responses**			**Number of Responses**		
HPA<=-20%	38,415	4,824	36,246	15,344	2,703	13,838
-20%<HPA<=0%	19,359	4,187	17,320	17,938	5,548	14,691
0%<HPA<=20%	8,883	3,254	7,194	23,053	9,208	17,487
20%<HPA	2,811	1,663	1,818	14,351	7,902	9,119
HPA Range	**Response Rate**			**Response Rate**		
HPA<=-20%	47.7%	12.6%	45.0%	32.1%	17.6%	29.0%
-20%<HPA<=0%	21.5%	21.6%	19.2%	14.5%	30.9%	11.9%
0%<HPA<=20%	9.6%	36.6%	7.8%	7.5%	39.9%	5.7%
20%<HPA	4.7%	59.2%	3.0%	4.2%	55.1%	2.7%
HPA Range	**Ratio of Uninsured to Insured Rate**					
HPA<=-20%	1.48	0.71	1.55			
-20%<HPA<=0%	1.48	0.70	1.61			
0%<HPA<=20%	1.28	0.92	1.37			
20%<HPA	1.11	1.07	1.13			

The table and exhibits provide the total loan count, the response variable count (i.e. Default 90, Cure Given Default 90, or Default_NC), the rate for the response variable, and the empirical relativity of uninsured loans against insured loans for each HPA category. The loan cohorts include loans originated in years 2002 Q1 through 2006 Q1 as loans originated in 2006 Q2 or later do not have 20 quarters of

development. For example, looking to the third data column for the variable Default_NC for the HPA category "HPA<=-20%" for uninsured loans, there were 80,539 loans in the 90 CLTV cohort with cumulative home price appreciation of less than or equal to -20% at 20 quarters of development. Of these loans:

- 38,415 ever reached a 90 days delinquency status or worse (Default_90);
- 36,246 reached a 90 days delinquency status or worse and subsequently did not cure from the default (Default_NC);
- 4,824 of the loans that were ever 90 days delinquent or worse subsequently cured (Cure Given Default 90); and
- 2,655 of these loans cures re-defaulted (36,246 – (38,415 – 4,824)) [Not shown in table].

The response rate for each variable varies considerably across the four HPA ranges. Specifically, for the loan population in Table 10, the Default_NC response variable for uninsured loans ranges from a 45.0% default rate in the lowest HPA range "HPA<=-20%" (45.0% = 36,246 / 80,539) to a 3.0% default rate in the highest HPA range "20%<HPA" (3.0% = 1,818 / 60,436) The Default_NC response variable for insured loans similarly ranges from a high of 29.0% (29.0% = 13,838 / 47,743) to a low of 2.7% (2.7% = 9,119 / 341,716) for the lowest and highest HPA ranges, respectively. The substantial range in default rates by HPA environment supports our conjecture that the HPA environment of a loan is significantly influential on the resulting default and cure rates.

Table 11 below shows the estimated model parameters for the CLTV_Insured variable and their associated significance for all originated loans in the filtered database in Population (1) for the Default_NC response variable. In a logistic regression, a parameter estimate is created for each category within a variable relative to the reference category. For the CLTV_Insured variable, the reference category for all models discussed in this paper is "80 Uninsured" referring to loans with an original CLTV of 80% without mortgage insurance

Table 11 Population 1 : All loans in the Filtered Database CLTV 90 Terminated and Active Loans Default_NC Model Parameter Estimates						
	90 Insured	90 Uninsured	95 Insured	95 Uninsured	GT95 Insured	GT95 Uninsured
HPA Range	**Parameter Estimates**					
HPA<=-20%	0.5587	0.7371	0.7719	0.9951	0.7197	1.3309
-20%<HPA<=0%	0.5123	0.7944	0.6905	1.0010	0.7581	1.5573
0%<HPA<=20%	0.5570	0.9001	0.6951	1.0949	0.8877	1.7937
20%<HPA	0.6111	0.9701	0.7872	1.0694	0.9780	1.8029
HPA Range	**Odds Ratio (Relative to 80 Uninsured)**					
HPA<=-20%	1.748	2.090	2.164	2.705	2.054	3.784
-20%<HPA<=0%	1.669	2.213	1.995	2.721	2.134	4.746
0%<HPA<=20%	1.745	2.460	2.004	2.989	2.430	6.012
20%<HPA	1.842	2.638	2.197	2.914	2.659	6.067
HPA Range	**Significance (ProbChiSq)**					
HPA<=-20%	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
-20%<HPA<=0%	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
0%<HPA<=20%	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
20%<HPA	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

In Table 11, the values under the “Parameter Estimates” label contain the maximum likelihood parameter estimate for the “CLTV_Insured” variable and the values below the “Parameter Estimates” label shows the Chi-square p-value associated with each the respective “CLTV_Insured” parameter estimate, all determined in SAS. As mentioned above because the variables are categorical (as are all of the variables in each model), the coefficients are relative to the reference level of the variable. A coefficient of zero implies the level is exactly the same as the reference level, whereas a negative coefficient implies a lower probability of the response than the reference level and a positive coefficient implies a higher probability of the response than the reference level.

Odds ratios for each coefficient are produced as part of the standard SAS output for logistic regression; Table 11 above provides the odds ratio for each CLTV_Insured level. An odds ratio for a particular level of a variable can be derived from its coefficient and is equal to e (base of the natural logarithm) raised to the coefficient for that level, and is the odds for the level as compared to the reference level. Using the results shown in Table 11, the odds ratio for a “90 Uninsured” loan in the “HPA<=-20%” HPA environment

against an otherwise identical loan that is classified as an "80 Uninsured" loan for the CLTV_Insured variable is about 2.090 ($2.090 = e^{0.7371}$). This can be stated that the odds that a "90 Insured" loan defaults is approximately 2.090 times that of an "80 Uninsured" loan in an "HPA<=-20%" HPA environment.

Exhibit 2 Pages 1 through 30 show the parameter estimates and their associated significance p-values for each of the 120 models created using the five populations, two data sets (all loans and terminated loans only), three response variables (Default 90, Cure, and Default_NC), and four HPA ranges. Note, not every model has an estimate for every possible variable in each model due to the stepwise variable selection process; if a variable was not included in the model per the stepwise selection process, Exhibit 2 shows "NA" for the parameter estimate. The stepwise algorithm to include or exclude a variable looks at threshold p-values that are based on inclusion or exclusion of the entire variable. In general, variable significance and the signs of and relationships between coefficients within any given model conformed to Milliman's expectations, which will be discussed in more detail below.

The p-value, shown in both Table 11 and Exhibit 2 Pages 1 through 30, for each coefficient is based on a test of the null hypothesis that the coefficient for that level is the same as the coefficient for the reference category, all else equal. The p-value for the stepwise regression is a different p-value than the Chi-square p-value associated with each parameter estimate. The threshold decision to include or exclude a variable is based on the hypothesis test that all the level coefficients are zero, or every level is the same as the reference level. A variable passes the test for inclusion if at least one of its levels is statistically different than the reference category. A variable can be statistically significant in the regression and have some of the category levels that are not statistically different from the reference level. For example on Exhibit 2 Page 1, the parameter estimate for the Quintile_String (Quintile_String represents the property value quintile) category "3" is -0.0119 with a Chi-square p-value of 0.2570, which is greater than the 10% requirement used in the stepwise selection. However, other levels of this variable are significant with a p-value of <0.0001, so the p-value for the entire variable is significant and the entire variable is included in the final model.

Exhibit 2 Page 1 provides the entire set of parameter estimates for Population (1) for the Default_NC response variable. In the less than negative 20% HPA range, assume a loan cohort has the following characteristics:

- 95 CLTV;
- 660-689 FICO (parameter estimate = 1.0671);
- SFR (parameter estimate = 0);
- ARM loan (parameter estimate = -0.1113),
- Non-Retail (parameter estimate = 0);
- C/O Refi (cash out refinance) (parameter estimate = 0.0948);
- Full documentation (parameter estimate = 0);
- Not an interest only loan (parameter estimate = 0);
- Not a negative amortization loan (parameter estimate = 0);
- 360 month term (parameter estimate = 0);
- 3 quintile of property values (parameter estimate = -0.0119);
- Second home (parameter estimate = 0.0728).

If the loans all had mortgage insurance at origination (i.e., 95 Insured), the logistic regression indicates the expected default rate for the loan cohort is:

$P_i = e^{\sum \beta i Xi} / (1 + e^{\sum \beta i Xi}) = e^{-0.9733} / (1 + e^{-0.9733}) = 27.4\%$

$\sum \beta i Xi = (-2.8567+0.7719+1.0671+0-0.1113+0+0.0948+0+0+0+0-0.0119+0.0728) = -0.9733$

If none of the loans had mortgage insurance at origination (i.e. 95 Uninsured), the logistic regression indicates the expected default rate for the loan cohort is:

$P_i = e^{\sum \beta i Xi} / (1 + e^{\sum \beta i Xi}) = e^{-0.7501} / (1 + e^{-0.7501}) = 32.1\%$

$\sum \beta i Xi = (-2.8567+0.9951+1.0671+0-0.1113+0+0.0948+0+0+0+0-0.0119+0.0728) = -0.7501$

As a result of the stepwise selection process, all variables included in any given model are significant at the 10% level. Because Milliman fit multiple models, the parameter estimates and each parameter's significance vary amongst models. One trend of interest is any level's coefficient that changes sign under the different models for each HPA bucket. This suggests the presence of a particular characteristic can have opposing effects depending on the HPA environment and supports Milliman's approach of using separate models for various HPA environments to study the relations between underwriting characteristics and performance. For example, in Exhibit 2 Page 1, the loan purpose R/T REFI (rate or term refinance) has a higher expected default rate under negative HPA environments and a lower expected default rate under positive HPA environments, all relative to the reference level of Purchase. This type of interaction can be challenging to capture when HPA is variable in the data. Similarly, coefficients that vary substantially in magnitude across the HPA categories also suggest the effect of the underwriting characteristic is not constant over broader HPA ranges. Alternatively, consistency in coefficients across HPA buckets suggests the effect of the characteristic is constant and segmenting the data is inconsequential to the results for that variable.

A general discussion for the Default_NC response variable model results for each explanatory variable in the Population (1) models is summarized below; the relevant parameter estimates can be viewed on Exhibit 2 Pages 1 and 4 for the all loans and terminated only loans models, respectively:

- *Amortization (Reference Level = Fixed, Other Levels = ARM)*: Contrary to expectations, ARM mortgages have a negative coefficient across all HPA environments although the coefficient is relatively small compared to other variables in the model. This observation holds when calibrating the models to both all loans (i.e., active and terminated loans) and terminated loans only. A possible explanation for this could be that the general trend of interest rates has been decreasing since late 2007 as the housing market collapsed potentially resulting in reduced monthly payments for ARM borrowers. Therefore, when controlling for other influential factors in the model, ARM defaulted less frequently than comparable fixed rate mortgages over the time period used for this analysis;

- *Combined Loan-to-Value (CLTV):* In line with expectations, the coefficients for similar CLTV categories (e.g., 95 uninsured relative to 90 uninsured and 95 insured relative to 90 insured) increase as the CLTV category increases. This result supports to our opinion that default rates have an inverse relationship with borrower equity: that is, as borrower equity increases, mortgage defaults decrease;

- *Documentation Type (Reference Level = Full, Other Levels = Low):* Loans categorized as either low or no documentation loans relative to full documentation loans have a large, positive coefficient for all HPA categories using both all loans and terminated only loans. These results support the opinion that the amount of documentation at loan origination has a large influence on the default likelihood of a mortgage;

- *FICO score (Reference Level = 780-850, Other Levels = 350-579, 580-599, 600-619, 620-659, 660-689, 690-719, 720-749, 750-779):* For all HPA categories and for both all loans and the terminated only loan model calibrations, the pattern between FICO score and the default rate follows the expected inverse relationship where lower FICO scores are associated with higher default rates and higher FICO scores are associated with lower default rates. One interesting observation is that the value of the coefficient for low FICO scores (e.g., FICO scores less than 660) increases as the HPA range increases from negative HPA environments to positive HPA environments. This suggests that the distinguishing effect of FICO score at origination is more diluted in negative HPA environments than in positive HPA environments;

- *Insured versus Uninsured:* For Population (1), the model coefficients support the empirical observation that the default rate for insured loans is less than the default rate for uninsured loans. That is, the coefficient for uninsured loans is larger than the coefficient for insured loans in the same CLTV cohort. More detail on comparisons between the relative performance of uninsured loans and insured loans is presented in a later section of this report;

- *Interest Only/Negative Amortization (Reference Level = No, Other Levels = Yes):* In line with expectations the coefficients associated with interest only flags and negative amortization flags are large and positive. The coefficient for loans categorized as interest only is generally larger than the coefficient for negative amortization flags. In addition, for the HPA category "20%>HPA", the negative amortization coefficient is relatively small for the all loans model and is not significant for the terminated only loans model;

- *Investor type:* For certain parts of the analysis, Milliman separated the loans into GSE and Private (i.e. not GSE) investor groups. This variable was not used as an explanatory variable in the regression models;

- *Loan purpose (Reference Level = Purchase, Other Levels = C/O Refi, R/T Refi):* The relationship between loan purpose and default frequency varies depending upon the HPA environment. For negative HPA environments, cash out refinance loans and rate/term refinance loans have a positive coefficient indicating an increased likelihood of default relative to purchase loans; for largely positive HPA environments (i.e. 20%<HPA), cash out refinance loans and rate/term refinance loans have negative coefficients indicating a decreased likelihood of default although the absolute magnitude of default rates in high HPA environments is relatively small;

- *Occupancy type (Reference Level = O[wner], Other Levels = I[nvestor], S[econd], U[nknown]):* In line with expectations, mortgages on investor properties have a positive coefficient for both the terminated and active loans dataset and the terminated only loans dataset. The coefficient on second home mortgages is mixed in magnitude with positive coefficients for all HPA environments with the exception of the 20%>HPA environment where the coefficient is negative. The results for unknown occupancy types vary in magnitude and sign across models;

- *Property type (Reference Level = SFR [Single Family Residence] . Other Levels = 2-4 U[nits], Condo):* The coefficient on 2-4 properties is positive for all HPA environments and for both the all loans dataset and the terminated only loans dataset, and the coefficients vary in magnitude across HPA environments. Positive coefficients for 2-4 Units are in line with expectations. The coefficient for condo varies in sign and magnitude across HPA environments:

- *Property value size (Reference Level = 2. Other Levels = 0, 1, 3, 4):* Each loan was assigned to a relative original property value size category based on the distribution of original property value sizes for each CBSA and origination year. To develop the original property value size categories Milliman looked at all loan originations in the Corelogic Data for origination years 2002 through 2007 by CBSA and origination year; Milliman determined original property value size quintiles for each geographic location by origination year. Milliman then assigned each loan to a quintile depending upon the size of the original property value of the loan, the location of the loan, and the origination year of the loan. The relationship between the relative original property value size and default rates tends to vary depending upon the loan's HPA environment; and

- *Term (Reference Level = 360, Other Levels = <360, >360):* Mortgages with an original term more than 30 years had positive coefficients in all HPA environments, consistent with expectations. Mortgages with terms less than 30 years generally had negative coefficients, consistent with expectations, except for in the most positive HPA environment '20%<HPA'.

- *Source (Reference Level = Non-Retail, Other Levels = Retail, Correspond[ence], Other) :* Correspondence loans had positive coefficients, consistent with Milliman's expectations. Other and Retail generally showed negative coefficients, but varied by HPA environment.

Exhibit 2 Pages 2 and 5 provide the parameter estimates for the Default_90 response variable on loans that have terminated by 20 quarters of development; the results generally mirror those for the Default_NC

response variable. Exhibit 2 Pages 3 and 6 provide the parameter estimates for the cure response variable on loans that have terminated by 20 quarters of development; a large portion of the variables in the model are not significant at the 10% level due to the generally low volume in the response variable by 20 quarters of development. The volume of loan cures and subsequent terminations within the valuation period is minimal and results are inconsistent between models. The parameter estimates of these models are questionable, and the reader should be careful in trying to interpret these results.

The parameter estimates for each default model (i.e. for each of the five loan populations using both all loans and terminated only loans) and default response variable (i.e. either Default 90 or Default NC) are generally in line with expectations. This observation reinforces the reasonableness of the approach and findings in this study and provides support for the uninsured/insured results presented below.

Comparison of Uninsured Loan Default Rates to Insured Loan Default Rates

To statistically assess whether loans with insurance perform differently than loans without insurance. Milliman computed Odds Relativities of comparable cohorts and performed contrasts to assess the significance level of each comparison. For this study. Milliman computed the ratio of pairs of odds ratios. which we called the Odds Relativity. Within a given model, Milliman compared the odds ratios for uninsured loan cohorts relative to insured loan cohorts for a given CLTV cohort. Table 12 below provides the Odds Relativity and results of the contrast for Population (1) estimated using both terminated and active loans at 20 quarters of development.

Table 12 Population 1 : All loans in the Filtered Database CLTV 90 Terminated and Active Loans Default_NC Odds Relativity (Uninsured to Insured)			
	90 CLTV	95 CLTV	GT95 CLTV
HPA Range	Odds Relativity		
HPA<=-20%	1.195	1.250	1.843
-20%<HPA<=0%	1.326	1.364	2.224
0%<HPA<=20%	1.409	1.491	2.474
20%<HPA	1.432	1.326	2.282
HPA Range	Significance (ProbChiSq)		
HPA<=-20%	<0.0001	<0.0001	<0.0001
-20%<HPA<=0%	<0.0001	<0.0001	<0.0001
0%<HPA<=20%	<0.0001	<0.0001	<0.0001
20%<HPA	<0.0001	<0.0001	<0.0001

For example, within the 90 CLTV cohort, Milliman compared the odds ratio of the "90 Uninsured" cohort relative to the "90 Insured" cohort. "90 Uninsured" represents loans with an initial CLTV of 90 and no mortgage insurance; "90 Insured" represents loans with an initial CLTV of 90 and mortgage insurance. The Odds Relativity for the 90 CLTV cohort in the "HPA<=-20%" HPA environment is 1.195 ($1.195 = e^{(0.7371)} / e^{(0.5587)}$ where 0.7371 and 0.5587 are the parameter estimates shown in Table 11) . This type of comparison follows the same principles as computing contrasts in ANOVA or linear regression, and one can equivalently look at the arithmetic difference in the coefficients or the ratio of odds ratios. The Odds Relativity for the 90 CLTV cohort indicates that the odds of an uninsured loan in the 90 CLTV category defaulting is approximately 1.2 times as great as the odds of an insured loan in the 90 CLTV category defaulting assuming all other underwriting and HPA performance are similar. The Odds Relativity comparisons for all loan populations and response variables are shown in Exhibit 3. For completeness, these exhibits also provide the loan counts and empirical default relativities within each cohort.

For each model described in this paper, Milliman compared the odds ratios of uninsured loan cohorts relative to the odds ratios for insured loan cohorts as follows:

- 90 combined LTV;
- 95 combined LTV; and
- Greater than 95 combined LTV.

An Odds Relativity greater than one occurs when the odds ratio for the uninsured loan cohort is larger than the odds ratio for the insured loan cohort, all else equal. Note that an Odds Relativity of greater than one for the default variables (Default_NC and Default_90) indicates the probability of default for the uninsured loan cohort is higher than the probability of default for the insured loan cohort. An Odds Relativity of less than one for the cure variable indicates the probability of cure for the uninsured loan cohort is lower than the probability of cure for the insured cohort. In both cases we would conclude based on the odds ratio point estimates and Odds Relativities that the cohort of loans with insurance performed better, either from defaulting less or curing more.

In Table 11, the p-values of each parameter estimate are all significant at the 0.0001 level. The p-value shown in Table 11 is a test of whether or not each category in Table 11 is statistically different from the reference category of "80 Uninsured." Similarly, Milliman performed contrasts to determine whether or not the insured/uninsured coefficients are statistically different from each other.. The p-values shown in Table 12 and on the Odds Relativity exhibits are calculated using the contrast statement in SAS; the contrast statement tests for a statistical difference between the given pair of coefficients, namely uninsured versus insured loans. Mechanistically for the contrast, all other variables are set to their reference levels. The p-values represent the likelihood of observing the actual data given that the difference between the two true coefficients is zero, or that the two true coefficients are equal. Lower p-values indicate it is less likely to have observed the data given the two coefficients are equal The p-values in Table 12 are the p-values of the contrast statement for Population (1) estimated using both terminated and active loans at 20 quarters of development. Table 12 indicates the Odds Relativities are significant at the 0.0001 level for every CLTV cohort. In other words, in any particular CLTV cohort. the probability of observing the actual data assuming there is no difference between the performance of insured and uninsured loans is 0.01%.

Exhibit 4 provides a visual summary of the Odds Relativities for the Default_NC variable for each of the models discussed in this report. In Exhibit 4, if the Odds Relativity is not significant at the 10% level, the Odds Relativity is not shown.

General Conclusions

In most of the CLTV cohorts and HPA environments for both Default_90 and Default_NC, the Odds Relativity is greater than one, which indicates the default frequency of uninsured loans is greater than the default frequency of insured loans after adjusting for underwriting characteristics and home price appreciation. This trend is most consistent in the models for large home price depreciation environments (appreciation of -20% or less). In general, the Odds Relativities are larger and have smaller p-values in the models with less favorable home price appreciation environments (e.g., HPA less than -20%).

The cure models based on all loans generally produce more reasonable results than in the terminated loans only models, at least in part because there are more observations to calibrate the models. We note that there are a nontrivial number of cells with very thin data, and those models should not be relied on for any inferences. Notwithstanding, the majority of the Odds Relativities are less than one in the cure models using all loans and concentrating on home price depreciation environments. An Odds Relativity of less than one in the cure models indicates uninsured loans are less likely to cure than insured loans. The p-values show a broad range across the models and CLTV cohorts, which is similar to the p-values in the default models. Many of the p-values are quite small, indicating a relatively low probability the coefficients are the same, but we note there are some p-values that are large with no evidence suggesting a difference in the coefficients.

OTHER CONSIDERATIONS

Cure Models and All Loans vs. Terminated Only

The cure models necessarily are calibrated with less data than the default models since a cure model is conditional on a loan default. That is, a loan must have defaulted prior to be considered for a cure model, and the cure model population is a subset of the loans used for the default models. Similarly, the models calibrated to the terminated loans only data are calibrated with less data than the models that use all loans. This is not only a data volume consideration but also a fundamental difference in the dependent variables of the models. In the all loans dataset (i.e. active and terminated loans) the dependent variable is the default probability for all loans originated as of the defined development period whereas the terminated only dataset is the default probability for loans that have terminated as of the defined development period. Although each tries to approximate the same response of interest, default probability, the difference between the two is more than their respective counts, and each approach has strengths and weaknesses.

Contrast P-Values

The p-values enhance the Odds Relativity statistic by encasing it in a probabilistic framework. However, we should be very clear about what the p-values for the contrasts mean. The contrast sets all other variables to the reference category and compares the requested point estimates for the given model in a two-sided test. This comparison is directly affected by the uncertainty associated with each point estimate, and uncertainty is influenced by both the true population characteristics and the sample size. Point estimates known with more certainty, i.e. which have less spread in their probability distribution, will be easier to discern statistical differences between than point estimates with less certainty. Importantly, these contrasts do not test for differences between the coefficients at levels other than the reference level for the other variables in the model. The p-values then are the probability the true coefficients are the same (the relative incidence is the same) for uninsured and insured loans, within a given model at the reference level for all other characteristics. This is also known as the probability of a Type I error, the probability of rejecting that the coefficients are equal when they are in fact the same. This tolerance level is subjective.

QUALIFICATIONS, LIMITATIONS AND DISCLOSURES

In performing this analysis, we have relied on data and other information available to us through Corelogic's LoanPerformance databases. 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.

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 analysis is not only possible, but is in fact probable. The sources of this variation are numerous: future national or regional economic conditions, mortgage prepayment speeds, the time period used to calibrate the regression models, and legislative changes affecting the mortgage business are examples

The uncertainty associated with our estimates is also magnified by the nature of mortgage performance. Mortgage defaults and prepayments 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 originated in a given year is generally active over several calendar years. Therefore, adverse economic conditions in a given calendar year could affect results not only for the current origination year, but also for prior origination years. Future economic developments that give rise to additional delinquencies and losses will impact ultimate defaults. Mortgage 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 model mortgage performance. The unsettled economic environment may worsen, causing more future defaults than currently observed in this analysis. Potentially offsetting the economic factors are government- and private-led initiatives that could have a stabilizing impact on the key variables typically driving the level of future defaults.

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 that 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 impact of mortgage insurance of mortgage default rates. Performance data used in our analysis was evaluated as of March 31, 2011.

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 the Mortgage Insurance Companies of America (MICA).

Scope

Our estimates of each cohort's parameters under this analysis are characterized as statistically-defined estimates (mean, median, nth percentile) using maximum likelihood estimation.

LIMITED DISTRIBUTION OF RESULTS

Milliman's work is prepared solely for the benefit of the Mortgage Insurance Companies of America. 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. The Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America subject to Milliman's prior review and approval, which shall not be unreasonably withheld or delayed. The Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America upon mutual agreement of the Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America in connection with any offering, prospectus, securities filing, or solicitation of investment. Professional reviewers engaged by the Mortgage Insurance Companies of America 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.

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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 the Mortgage Insurance Companies of America on this assignment.

Respectfully submitted,

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July 28, 2011

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Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 1: All loans in the filtered dataset
CLTV Cohort 80

Terminated and Active Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	288,697	61,019	288,697	0	0	0
-20%<HPA<=0%	536,891	36,160	536,891	0	0	0
0%<HPA<=20%	917,340	25,131	917,340	0	0	0
20%<HPA	1,028,961	14,151	1,028,961	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	61,019	8,215	56,219	0	0	0
-20%<HPA<=0%	36,160	8,159	31,264	0	0	0
0%<HPA<=20%	25,131	8,271	19,804	0	0	0
20%<HPA	14,151	6,386	9,506	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	21.1%	13.5%	19.5%	NA	NA	NA
-20%<HPA<=0%	6.7%	22.6%	5.8%	NA	NA	NA
0%<HPA<=20%	2.7%	32.9%	2.2%	NA	NA	NA
20%<HPA	1.4%	45.1%	0.9%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	155,940	29,091	155,940	0	0	0
-20%<HPA<=0%	318,568	15,311	318,568	0	0	0
0%<HPA<=20%	574,489	13,024	574,489	0	0	0
20%<HPA	710,353	9,132	710,353	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	29,091	1,439	28,636	0	0	0
-20%<HPA<=0%	15,311	1,638	14,606	0	0	0
0%<HPA<=20%	13,024	2,704	11,359	0	0	0
20%<HPA	9,132	3,056	6,936	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	18.7%	4.9%	18.4%	NA	NA	NA
-20%<HPA<=0%	4.8%	10.7%	4.6%	NA	NA	NA
0%<HPA<=20%	2.3%	20.8%	2.0%	NA	NA	NA
20%<HPA	1.3%	33.5%	1.0%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 1: All loans in the filtered dataset
CLTV Cohort 90

Terminated and Active Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	80,539	38,415	80,539	47,743	15,344	47,743
-20%<HPA<=0%	90,231	19,359	90,231	123,527	17,938	123,527
0%<HPA<=20%	92,784	8,883	92,784	308,605	23,053	308,605
20%<HPA	60,436	2,811	60,436	341,716	14,351	341,716
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	38,415	4,824	36,246	15,344	2,703	13,838
-20%<HPA<=0%	19,359	4,187	17,320	17,938	5,548	14,691
0%<HPA<=20%	8,883	3,254	7,194	23,053	9,208	17,487
20%<HPA	2,811	1,663	1,818	14,351	7,902	9,119
HPA Range	Response Rate			Response Rate		
HPA<=-20%	47.7%	12.6%	45.0%	32.1%	17.6%	29.0%
-20%<HPA<=0%	21.5%	21.6%	19.2%	14.5%	30.9%	11.9%
0%<HPA<=20%	9.6%	36.6%	7.8%	7.5%	39.9%	5.7%
20%<HPA	4.7%	59.2%	3.0%	4.2%	55.1%	2.7%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.484	0.713	1.553			
-20%<HPA<=0%	1.477	0.699	1.614			
0%<HPA<=20%	1.282	0.917	1.368			
20%<HPA	1.108	1.074	1.127			

Terminated Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	33,361	18,040	33,361	21,721	6,792	21,721
-20%<HPA<=0%	33,881	6,778	33,881	56,257	6,480	56,257
0%<HPA<=20%	31,769	2,929	31,769	154,422	10,082	154,422
20%<HPA	13,882	704	13,882	199,332	7,114	199,332
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	18,040	861	17,953	6,792	511	6,600
-20%<HPA<=0%	6,778	564	6,661	6,480	870	6,132
0%<HPA<=20%	2,929	524	2,732	10,082	2,142	8,995
20%<HPA	704	285	531	7,114	2,681	5,396
HPA Range	Response Rate			Response Rate		
HPA<=-20%	54.1%	4.8%	53.8%	31.3%	7.5%	30.4%
-20%<HPA<=0%	20.0%	8.3%	19.7%	11.5%	13.4%	10.9%
0%<HPA<=20%	9.2%	17.9%	8.6%	6.5%	21.2%	5.8%
20%<HPA	5.1%	40.5%	3.8%	3.6%	37.7%	2.7%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.729	0.634	1.771			
-20%<HPA<=0%	1.737	0.620	1.804			
0%<HPA<=20%	1.412	0.842	1.476			
20%<HPA	1.421	1.074	1.413			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 1: All loans in the filtered dataset
CLTV Cohort 95

Terminated and Active Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	21,854	9,976	21,854	20,912	7,077	20,912
-20%<HPA<=0%	44,092	8,358	44,092	61,640	9,119	61,640
0%<HPA<=20%	63,349	5,535	63,349	196,782	15,587	196,782
20%<HPA	37,426	1,882	37,426	225,957	11,695	225,957
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	9,976	1,124	9,496	7,077	1,222	6,443
-20%<HPA<=0%	8,358	1,986	7,392	9,119	3,040	7,468
0%<HPA<=20%	5,535	2,026	4,491	15,587	6,978	11,597
20%<HPA	1,882	1,125	1,248	11,695	6,604	7,483
HPA Range	Response Rate			Response Rate		
HPA<=-20%	45.6%	11.3%	43.5%	33.8%	17.3%	30.8%
-20%<HPA<=0%	19.0%	23.8%	16.8%	14.8%	33.3%	12.1%
0%<HPA<=20%	8.7%	36.6%	7.1%	7.9%	44.8%	5.9%
20%<HPA	5.0%	59.8%	3.3%	5.2%	56.5%	3.3%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.349	0.653	1.410			
-20%<HPA<=0%	1.281	0.713	1.384			
0%<HPA<=20%	1.103	0.818	1.203			
20%<HPA	0.972	1.059	1.007			

Terminated Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	8,105	4,843	8,105	9,072	3,106	9,072
-20%<HPA<=0%	16,143	3,010	16,143	26,977	3,120	26,977
0%<HPA<=20%	23,205	1,971	23,205	95,859	6,565	95,859
20%<HPA	10,140	481	10,140	126,861	5,608	126,861
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	4,843	234	4,821	3,106	237	3,041
-20%<HPA<=0%	3,010	252	2,971	3,120	509	2,940
0%<HPA<=20%	1,971	315	1,868	6,565	1,579	5,903
20%<HPA	481	178	391	5,608	2,105	4,331
HPA Range	Response Rate			Response Rate		
HPA<=-20%	59.8%	4.8%	59.5%	34.2%	7.6%	33.5%
-20%<HPA<=0%	18.6%	8.4%	18.4%	11.6%	16.3%	10.9%
0%<HPA<=20%	8.5%	16.0%	8.0%	6.8%	24.1%	6.1%
20%<HPA	4.7%	37.0%	3.9%	4.4%	37.5%	3.4%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.745	0.633	1.774			
-20%<HPA<=0%	1.612	0.513	1.689			
0%<HPA<=20%	1.240	0.664	1.330			
20%<HPA	1.073	0.986	1.129			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 1: All loans in the filtered dataset
CLTV Cohort: GT95

Terminated and Active Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 90	Default 9C	Default NC	Default 90	Default 9C	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	35,323	19,923	35,323	28,024	8,592	28,024
-20%<HPA<=0%	68,218	21,619	68,216	131,023	23,491	131,023
0%<HPA<=20%	116,952	26,902	116,952	490,179	61,156	490,179
20%<HPA	63,413	12,779	63,413	523,286	45,205	523,286
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	19,923	2,695	18,774	8,592	2,116	7,597
-20%<HPA<=0%	21,619	6,587	19,038	23,491	9,195	18,857
0%<HPA<=20%	26,902	13,217	21,605	61,156	28,213	46,409
20%<HPA	12,779	8,376	8,734	45,205	23,093	32,236
HPA Range	Response Rate			Response Rate		
HPA<=-20%	56.4%	13.5%	53.1%	30.7%	24.6%	27.1%
-20%<HPA<=0%	31.7%	30.5%	27.9%	17.9%	39.1%	14.4%
0%<HPA<=20%	23.0%	49.1%	18.5%	12.5%	46.1%	9.5%
20%<HPA	20.2%	65.5%	13.8%	8.6%	51.1%	6.2%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.840	0.549	1.961			
-20%<HPA<=0%	1.768	0.778	1.939			
0%<HPA<=20%	1.844	1.065	1.951			
20%<HPA	2.333	1.283	2.236			

Terminated Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 9C	Default 9D	Default NC	Default 9C	Default 9D	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	15,675	10,733	15,675	14,576	4,647	14,576
-20%<HPA<=0%	23,624	7,425	23,624	63,674	11,366	63,674
0%<HPA<=20%	37,154	7,352	37,154	245,040	31,500	245,040
20%<HPA	15,031	2,874	15,031	330,249	26,905	330,249
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	10,733	570	10,695	4,647	685	4,421
-20%<HPA<=0%	7,425	894	7,309	11,366	2,266	10,611
0%<HPA<=20%	7,352	1,872	6,977	31,500	7,384	28,573
20%<HPA	2,874	1,366	2,327	26,905	8,918	22,211
HPA Range	Response Rate			Response Rate		
HPA<=-20%	68.5%	5.3%	68.2%	31.9%	14.7%	30.3%
-20%<HPA<=0%	31.4%	12.0%	30.9%	17.9%	19.9%	16.7%
0%<HPA<=20%	19.8%	25.5%	18.8%	12.9%	23.4%	11.7%
20%<HPA	19.1%	47.5%	15.5%	8.1%	33.1%	6.7%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	2.148	0.360	2.250			
-20%<HPA<=0%	1.761	0.604	1.857			
0%<HPA<=20%	1.539	1.086	1.610			
20%<HPA	2.347	1.434	2.302			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 2: All Loans excluding FHA and GT95 CLTV
CLTV Cohort: 80

Terminated and Active Loans

	80 Uninsured			80 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	288,697	61,019	288,697	0	0	0
-20%<HPA<=0%	536,891	36,160	536,891	0	0	0
0%<HPA<=20%	917,340	25,131	917,340	0	0	0
20%<HPA	1,028,961	14,151	1,028,961	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	61,019	8,215	56,219	0	0	0
-20%<HPA<=0%	36,160	8,159	31,264	0	0	0
0%<HPA<=20%	25,131	8,271	19,804	0	0	0
20%<HPA	14,151	6,386	9,506	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	21.1%	13.5%	19.5%	NA	NA	NA
-20%<HPA<=0%	6.7%	22.6%	5.8%	NA	NA	NA
0%<HPA<=20%	2.7%	32.9%	2.2%	NA	NA	NA
20%<HPA	1.4%	45.1%	0.9%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	80 Uninsured			80 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	155,940	29,091	155,940	0	0	0
-20%<HPA<=0%	318,568	15,311	318,568	0	0	0
0%<HPA<=20%	574,489	13,024	574,489	0	0	0
20%<HPA	710,353	9,132	710,353	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	29,091	1,439	28,636	0	0	0
-20%<HPA<=0%	15,311	1,638	14,606	0	0	0
0%<HPA<=20%	13,024	2,704	11,359	0	0	0
20%<HPA	9,132	3,056	6,936	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	18.7%	4.9%	18.4%	NA	NA	NA
-20%<HPA<=0%	4.8%	10.7%	4.6%	NA	NA	NA
0%<HPA<=20%	2.3%	20.8%	2.0%	NA	NA	NA
20%<HPA	1.3%	33.5%	1.0%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 2: All loans excluding FHA and GT95 CLTV
CLTV Cohort: 90

Terminated and Active Loans

	90 Uninsured			90 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	80,539	38,415	80,539	44,408	14,876	44,408
-20%<HPA<=0%	90,231	19,359	90,231	109,852	16,567	109,852
0%<HPA<=20%	92,784	8,883	92,784	267,317	19,664	267,317
20%<HPA	60,436	2,811	60,436	278,755	10,519	278,755
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	38,415	4,824	36,246	14,876	2,515	13,480
-20%<HPA<=0%	19,359	4,187	17,320	16,567	4,854	13,770
0%<HPA<=20%	8,883	3,254	7,194	19,664	7,423	15,215
20%<HPA	2,811	1,663	1,818	10,519	5,819	6,599
HPA Range	Response Rate			Response Rate		
HPA<=-20%	47.7%	12.6%	45.0%	33.5%	16.9%	30.4%
-20%<HPA<=0%	21.5%	21.6%	19.2%	15.1%	29.3%	12.5%
0%<HPA<=20%	9.6%	36.6%	7.8%	7.4%	37.7%	5.7%
20%<HPA	4.7%	59.2%	3.0%	3.8%	55.3%	2.4%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.424	0.743	1.483			
-20%<HPA<=0%	1.423	0.738	1.531			
0%<HPA<=20%	1.301	0.970	1.362			
20%<HPA	1.233	1.069	1.271			

Terminated Loans

	90 Uninsured			90 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	33,361	18,040	33,361	19,815	6,575	19,815
-20%<HPA<=0%	33,881	6,778	33,881	48,479	5,891	48,479
0%<HPA<=20%	31,769	2,929	31,769	131,518	8,358	131,518
20%<HPA	13,882	704	13,882	157,011	4,683	157,011
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	18,040	861	17,953	6,575	470	6,399
-20%<HPA<=0%	6,778	564	6,661	5,891	727	5,620
0%<HPA<=20%	2,929	524	2,732	8,358	1,608	7,565
20%<HPA	704	285	531	4,683	1,709	3,550
HPA Range	Response Rate			Response Rate		
HPA<=-20%	54.1%	4.8%	53.8%	33.2%	7.1%	32.3%
-20%<HPA<=0%	20.0%	8.3%	19.7%	12.2%	12.3%	11.6%
0%<HPA<=20%	9.2%	17.9%	8.6%	6.4%	19.2%	5.8%
20%<HPA	5.1%	40.5%	3.8%	3.0%	36.5%	2.3%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.630	0.668	1.666			
-20%<HPA<=0%	1.646	0.674	1.696			
0%<HPA<=20%	1.451	0.930	1.495			
20%<HPA	1.700	1.109	1.692			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 2: All loans excluding FHA and GT95 CLTV
CLTV Cohort: 95

Terminated and Active Loans

	95 Uninsured			95 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	21,854	9,976	21,854	19,414	6,828	19,414
-20%<HPA<=0%	44,092	8,358	44,092	53,427	8,225	53,427
0%<HPA<=20%	63,349	5,535	63,349	163,582	12,360	163,582
20%<HPA	37,426	1,882	37,426	181,614	8,449	181,614
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	9,976	1,124	9,496	6,828	1,139	6,239
-20%<HPA<=0%	8,358	1,986	7,392	8,225	2,596	6,836
0%<HPA<=20%	5,535	2,026	4,491	12,360	5,353	9,323
20%<HPA	1,882	1,125	1,248	8,449	4,914	5,244
HPA Range	Response Rate			Response Rate		
HPA<=-20%	45.6%	11.3%	43.5%	35.2%	16.7%	32.1%
-20%<HPA<=0%	19.0%	23.8%	16.8%	15.4%	31.6%	12.8%
0%<HPA<=20%	8.7%	36.6%	7.1%	7.6%	43.3%	5.7%
20%<HPA	5.0%	59.8%	3.3%	4.7%	58.2%	2.9%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.298	0.675	1.352			
-20%<HPA<=0%	1.231	0.753	1.310			
0%<HPA<=20%	1.156	0.845	1.244			
20%<HPA	1.081	1.028	1.155			

Terminated Loans

	95 Uninsured			95 Insured		
	Default_90	Cure Given Default_90	Default_NC	Default_90	Cure Given Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	8,105	1,843	8,105	8,283	2,970	8,283
-20%<HPA<=0%	16,143	3,010	16,143	22,896	2,743	22,896
0%<HPA<=20%	23,205	1,971	23,205	79,008	4,922	79,008
20%<HPA	10,140	481	10,140	98,521	3,589	98,521
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	4,843	234	4,821	2,970	216	2,914
-20%<HPA<=0%	3,010	252	2,971	2,743	413	2,604
0%<HPA<=20%	1,971	315	1,868	4,922	1,117	4,389
20%<HPA	481	178	391	3,589	1,363	2,730
HPA Range	Response Rate			Response Rate		
HPA<=-20%	59.8%	4.8%	59.5%	35.9%	7.3%	35.2%
-20%<HPA<=0%	18.6%	8.4%	18.4%	12.0%	15.1%	11.4%
0%<HPA<=20%	8.5%	16.0%	8.0%	6.2%	22.7%	5.6%
20%<HPA	4.7%	37.0%	3.9%	3.6%	38.0%	2.8%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.666	0.664	1.691			
-20%<HPA<=0%	1.556	0.556	1.618			
0%<HPA<=20%	1.363	0.704	1.449			
20%<HPA	1.302	0.974	1.392			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 2: All loans excluding FHA and GT95 CLTV
CLTV Cohort: GT95

Terminated and Active Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default_90	Default_90	Default_NC	Default_90	Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default_90	Default_90	Default_NC	Default_90	Default_90	Default_NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
CLTV Cohort 80

Terminated and Active Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	36,093	3,571	36,093	0	0	0
-20%<HPA<=0%	113,787	2,840	113,787	0	0	0
0%<HPA<=20%	255,035	2,784	255,035	0	0	0
20%<HPA	322,005	1,906	322,005	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	3,571	489	3,196	0	0	0
-20%<HPA<=0%	2,840	666	2,362	0	0	0
0%<HPA<=20%	2,784	915	2,130	0	0	0
20%<HPA	1,906	883	1,223	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	9.9%	13.7%	8.9%	NA	NA	NA
-20%<HPA<=0%	2.5%	23.5%	2.1%	NA	NA	NA
0%<HPA<=20%	1.1%	32.9%	0.8%	NA	NA	NA
20%<HPA	0.6%	46.3%	0.4%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	15,935	1,382	15,935	0	0	0
-20%<HPA<=0%	60,412	962	60,412	0	0	0
0%<HPA<=20%	147,253	1,389	147,253	0	0	0
20%<HPA	206,196	1,116	206,196	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	1,382	62	1,345	0	0	0
-20%<HPA<=0%	962	105	901	0	0	0
0%<HPA<=20%	1,389	292	1,188	0	0	0
20%<HPA	1,116	365	842	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	8.7%	4.5%	8.4%	NA	NA	NA
-20%<HPA<=0%	1.6%	10.9%	1.5%	NA	NA	NA
0%<HPA<=20%	0.9%	21.0%	0.8%	NA	NA	NA
20%<HPA	0.5%	32.7%	0.4%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
CLTV Cohort 90

Terminated and Active Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	3,145	582	3,145	6,006	1,175	6,006
-20%<HPA<=0%	8,817	536	8,817	20,819	1,431	20,819
0%<HPA<=20%	14,544	344	14,544	67,874	1,740	67,874
20%<HPA	12,697	133	12,697	90,049	1,296	90,049
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	582	87	519	1,175	164	1,053
-20%<HPA<=0%	536	129	454	1,431	351	1,200
0%<HPA<=20%	344	114	261	1,740	595	1,317
20%<HPA	133	78	78	1,296	649	796
HPA Range	Response Rate			Response Rate		
HPA<=-20%	18.5%	14.9%	16.5%	19.6%	14.0%	17.5%
-20%<HPA<=0%	6.1%	24.1%	5.1%	6.9%	24.5%	5.8%
0%<HPA<=20%	2.4%	33.1%	1.8%	2.6%	34.3%	1.9%
20%<HPA	1.0%	58.6%	0.6%	1.4%	50.1%	0.9%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	0.946	1.071	0.941			
-20%<HPA<=0%	0.884	0.981	0.893			
0%<HPA<=20%	0.923	0.967	0.925			
20%<HPA	0.728	1.171	0.695			

Terminated Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	575	193	575	1,988	408	1,988
-20%<HPA<=0%	2,626	159	2,626	8,532	424	8,532
0%<HPA<=20%	3,531	108	3,531	37,251	720	37,251
20%<HPA	1,198	21	1,198	56,881	685	56,881
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	193	4	192	408	21	400
-20%<HPA<=0%	159	10	157	424	46	403
0%<HPA<=20%	109	17	98	720	126	640
20%<HPA	21	9	16	685	221	517
HPA Range	Response Rate			Response Rate		
HPA<=-20%	33.6%	2.1%	33.4%	20.5%	5.1%	20.1%
-20%<HPA<=0%	6.1%	6.3%	6.0%	5.0%	10.8%	4.7%
0%<HPA<=20%	3.1%	15.7%	2.8%	1.9%	17.5%	1.7%
20%<HPA	1.8%	42.9%	1.3%	1.2%	32.3%	0.9%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.635	0.403	1.660			
-20%<HPA<=0%	1.218	0.580	1.266			
0%<HPA<=20%	1.582	0.899	1.615			
20%<HPA	1.456	1.328	1.469			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
CLTV Cohort 95

Terminated and Active Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	2,269	482	2,269	3,187	672	3,187
-20%<HPA<=0%	7,967	555	7,967	11,795	787	11,795
0%<HPA<=20%	14,238	360	14,238	47,684	1,164	47,684
20%<HPA	9,254	121	9,254	62,894	1,028	62,894
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	482	66	436	672	84	609
-20%<HPA<=0%	555	133	467	787	199	650
0%<HPA<=20%	360	124	279	1,164	437	844
20%<HPA	121	59	77	1,028	539	649
HPA Range	Response Rate			Response Rate		
HPA<=-20%	21.2%	13.7%	19.2%	21.1%	12.5%	19.1%
-20%<HPA<=0%	7.0%	24.0%	5.9%	6.7%	25.3%	5.5%
0%<HPA<=20%	2.5%	34.4%	2.0%	2.4%	37.5%	1.8%
20%<HPA	1.3%	48.8%	0.8%	1.6%	52.4%	1.0%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.007	1.095	1.006			
-20%<HPA<=0%	1.044	0.948	1.064			
0%<HPA<=20%	1.036	0.917	1.107			
20%<HPA	0.800	0.930	0.806			

Terminated Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	460	190	460	1,016	217	1,016
-20%<HPA<=0%	2,426	152	2,426	4,621	235	4,621
0%<HPA<=20%	4,175	124	4,175	24,426	467	24,426
20%<HPA	1,459	27	1,459	37,396	545	37,396
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	190	8	188	217	9	214
-20%<HPA<=0%	152	6	151	235	14	227
0%<HPA<=20%	124	17	117	467	96	402
20%<HPA	27	7	21	545	186	419
HPA Range	Response Rate			Response Rate		
HPA<=-20%	41.3%	4.2%	40.9%	21.4%	4.1%	21.1%
-20%<HPA<=0%	6.3%	3.9%	6.2%	5.1%	6.0%	4.9%
0%<HPA<=20%	3.0%	13.7%	2.8%	1.9%	20.6%	1.6%
20%<HPA	1.9%	25.9%	1.4%	1.5%	34.1%	1.1%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.934	1.015	1.940			
-20%<HPA<=0%	1.232	0.663	1.267			
0%<HPA<=20%	1.553	0.667	1.703			
20%<HPA	1.270	0.760	1.285			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
CLTV Cohort: GT95

Terminated and Active Loans

	GT95 Uninsured			GT95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	GT95 Uninsured			GT95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort: 80

Terminated and Active Loans

	80 Uninsured			80 Insured		
	Default: 90	Cure Given Default: 90	Default: NC	Default: 90	Cure Given Default: 90	Default: NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	169,920	39,881	169,920	0	0	0
-20%<HPA<=0%	249,563	20,113	249,563	0	0	0
0%<HPA<=20%	310,014	9,423	310,014	0	0	0
20%<HPA	267,988	3,513	267,988	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	39,881	5,090	37,169	0	0	0
-20%<HPA<=0%	20,113	3,778	16,052	0	0	0
0%<HPA<=20%	9,423	2,598	7,857	0	0	0
20%<HPA	3,513	1,409	2,527	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	23.5%	12.8%	21.9%	NA	NA	NA
-20%<HPA<=0%	8.1%	18.8%	7.2%	NA	NA	NA
0%<HPA<=20%	3.0%	27.6%	2.5%	NA	NA	NA
20%<HPA	1.3%	40.1%	0.9%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	80 Uninsured			80 Insured		
	Default: 90	Cure Given Default: 90	Default: NC	Default: 90	Cure Given Default: 90	Default: NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	102,863	19,633	102,863	0	0	0
-20%<HPA<=0%	169,923	9,297	169,923	0	0	0
0%<HPA<=20%	239,254	5,584	239,254	0	0	0
20%<HPA	215,525	2,554	215,525	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	19,633	974	19,334	0	0	0
-20%<HPA<=0%	9,297	865	8,930	0	0	0
0%<HPA<=20%	5,584	1,083	4,926	0	0	0
20%<HPA	2,554	856	1,953	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	19.1%	5.0%	18.8%	NA	NA	NA
-20%<HPA<=0%	5.5%	9.3%	5.3%	NA	NA	NA
0%<HPA<=20%	2.3%	19.4%	2.1%	NA	NA	NA
20%<HPA	1.2%	33.5%	0.9%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort: 90

Terminated and Active Loans

HPA Range	90 Uninsured			90 Insured		
	Default: 90	Cure Given Default: 90	Default: NC	Default: 90	Cure Given Default: 90	Default: NC
	Observed Loan Count			Observed Loan Count		
HPA<=-20%	59,350	30,531	59,350	16,736	6,067	16,736
-20%<HPA<=0%	51,992	14,247	51,992	31,107	4,615	31,107
0%<HPA<=20%	39,084	5,675	39,084	64,135	4,713	64,135
20%<HPA	22,787	1,702	22,787	59,026	2,464	59,026
	Number of Responses			Number of Responses		
HPA<=-20%	30,531	3,849	28,946	6,067	961	5,624
-20%<HPA<=0%	14,247	2,986	12,936	4,615	1,212	4,017
0%<HPA<=20%	5,675	2,156	4,662	4,713	1,567	3,874
20%<HPA	1,702	1,070	1,122	2,464	1,058	1,792
	Response Rate			Response Rate		
HPA<=-20%	51.4%	12.6%	48.8%	36.3%	15.8%	33.6%
-20%<HPA<=0%	27.4%	21.0%	24.9%	14.8%	26.3%	12.9%
0%<HPA<=20%	14.5%	38.0%	11.9%	7.3%	33.1%	6.0%
20%<HPA	7.5%	62.9%	4.9%	4.2%	42.9%	3.0%
	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.419	0.796	1.451			
-20%<HPA<=0%	1.847	0.798	1.927			
0%<HPA<=20%	1.976	1.146	1.970			
20%<HPA	1.789	1.464	1.622			

Terminated Loans

HPA Range	90 Uninsured			90 Insured		
	Default: 90	Cure Given Default: 90	Default: NC	Default: 90	Cure Given Default: 90	Default: NC
	Observed Loan Count			Observed Loan Count		
HPA<=-20%	25,776	14,062	25,776	9,266	2,749	9,266
-20%<HPA<=0%	19,599	4,919	19,599	18,454	1,712	18,454
0%<HPA<=20%	12,737	1,714	12,737	44,173	2,541	44,173
20%<HPA	3,685	326	3,685	46,307	1,674	46,307
	Number of Responses			Number of Responses		
HPA<=-20%	14,062	730	13,994	2,749	173	2,698
-20%<HPA<=0%	4,919	414	4,839	1,712	196	1,647
0%<HPA<=20%	1,714	331	1,599	2,541	487	2,308
20%<HPA	326	149	250	1,674	539	1,318
	Response Rate			Response Rate		
HPA<=-20%	54.6%	5.2%	54.3%	29.7%	6.3%	29.1%
-20%<HPA<=0%	25.1%	8.4%	24.7%	9.3%	11.4%	8.9%
0%<HPA<=20%	13.5%	19.3%	12.6%	5.8%	19.2%	5.2%
20%<HPA	8.8%	45.7%	6.8%	3.6%	32.2%	2.8%
	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.839	0.825	1.865			
-20%<HPA<=0%	2.705	0.735	2.766			
0%<HPA<=20%	2.339	1.008	2.403			
20%<HPA	2.447	1.419	2.384			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 4 All loans excluding FHA GT95 CLTV, and GSE
CLTV Cohort 95

Terminated and Active Loans

HPA Range	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
	Observed Loan Count			Observed Loan Count		
HPA<=-20%	12,775	6,897	12,775	7,163	2,782	7,163
-20%<HPA<=0%	18,620	4,932	18,620	15,402	2,482	15,402
0%<HPA<=20%	20,938	3,220	20,938	38,098	2,978	38,098
20%<HPA	11,084	1,238	11,084	34,570	1,609	34,570
	Number of Responses			Number of Responses		
HPA<=-20%	6,897	774	6,624	2,782	443	2,589
-20%<HPA<=0%	4,932	1,247	4,397	2,482	739	2,112
0%<HPA<=20%	3,220	1,297	2,822	2,978	1,099	2,435
20%<HPA	1,238	782	833	1,609	741	1,161
	Response Rate			Response Rate		
HPA<=-20%	54.0%	11.2%	51.9%	38.8%	15.9%	36.1%
-20%<HPA<=0%	26.5%	25.3%	23.6%	16.1%	29.8%	13.7%
0%<HPA<=20%	15.4%	40.3%	12.5%	7.8%	36.9%	6.4%
20%<HPA	11.2%	63.2%	7.5%	4.7%	46.1%	3.4%
	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.390	0.705	1.435			
-20%<HPA<=0%	1.644	0.849	1.722			
0%<HPA<=20%	1.967	1.091	1.959			
20%<HPA	2.400	1.372	2.236			

Terminated Loans

HPA Range	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
	Observed Loan Count			Observed Loan Count		
HPA<=-20%	5,229	3,305	5,229	3,878	1,198	3,878
-20%<HPA<=0%	6,884	1,685	6,884	9,085	873	9,085
0%<HPA<=20%	7,833	991	7,833	27,837	1,491	27,837
20%<HPA	2,368	245	2,368	27,497	1,011	27,497
	Number of Responses			Number of Responses		
HPA<=-20%	3,305	179	3,287	1,198	79	1,181
-20%<HPA<=0%	1,685	163	1,669	873	117	838
0%<HPA<=20%	991	192	940	1,491	329	1,330
20%<HPA	245	91	207	1,011	329	799
	Response Rate			Response Rate		
HPA<=-20%	63.2%	5.4%	62.9%	30.9%	6.6%	30.5%
-20%<HPA<=0%	24.5%	9.7%	24.2%	9.6%	13.4%	9.2%
0%<HPA<=20%	12.7%	19.4%	12.0%	5.4%	22.1%	4.8%
20%<HPA	10.3%	37.1%	8.7%	3.7%	32.5%	2.9%
	Ratio of Uninsured to Insured Rate					
HPA<=-20%	2.046	0.821	2.064			
-20%<HPA<=0%	2.547	0.722	2.628			
0%<HPA<=20%	2.362	0.878	2.512			
20%<HPA	2.814	1.141	3.008			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort: GT95

Terminated and Active Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 90	Default 90	Default NC	Default 90	Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 90	Default 90	Default NC	Default 90	Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort 80

Terminated and Active Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	13,865	921	13,865	0	0	0
-20%<HPA<=0%	38,357	727	38,357	0	0	0
0%<HPA<=20%	69,438	712	69,438	0	0	0
20%<HPA	77,641	469	77,641	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	921	141	814	0	0	0
-20%<HPA<=0%	727	160	612	0	0	0
0%<HPA<=20%	712	187	577	0	0	0
20%<HPA	469	181	327	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	6.6%	15.3%	5.9%	NA	NA	NA
-20%<HPA<=0%	1.9%	22.0%	1.6%	NA	NA	NA
0%<HPA<=20%	1.0%	26.3%	0.8%	NA	NA	NA
20%<HPA	0.6%	38.6%	0.4%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	80 Uninsured			80 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	8,308	358	8,308	0	0	0
-20%<HPA<=0%	26,997	312	26,997	0	0	0
0%<HPA<=20%	55,641	513	55,641	0	0	0
20%<HPA	61,382	374	61,382	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	358	21	342	0	0	0
-20%<HPA<=0%	312	36	288	0	0	0
0%<HPA<=20%	513	107	430	0	0	0
20%<HPA	374	120	278	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	4.3%	5.9%	4.1%	NA	NA	NA
-20%<HPA<=0%	1.2%	11.5%	1.1%	NA	NA	NA
0%<HPA<=20%	0.9%	20.9%	0.8%	NA	NA	NA
20%<HPA	0.6%	32.1%	0.5%	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort 90

Terminated and Active Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	1,182	240	1,182	1,549	272	1,549
-20%<HPA<=0%	2,905	202	2,905	5,217	278	5,217
0%<HPA<=20%	5,531	161	5,531	14,374	334	14,374
20%<HPA	6,209	61	6,209	16,634	393	16,634
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	240	39	213	272	32	249
-20%<HPA<=0%	202	48	169	278	53	244
0%<HPA<=20%	161	54	121	334	107	269
20%<HPA	61	40	35	393	135	289
HPA Range	Response Rate			Response Rate		
HPA<=-20%	20.3%	16.3%	18.0%	17.6%	11.8%	16.1%
-20%<HPA<=0%	7.0%	23.8%	5.8%	5.3%	19.1%	4.7%
0%<HPA<=20%	2.9%	33.5%	2.2%	2.3%	30.5%	1.9%
20%<HPA	1.0%	65.6%	0.6%	2.4%	34.4%	1.7%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.156	1.381	1.121			
-20%<HPA<=0%	1.305	1.246	1.244			
0%<HPA<=20%	1.253	1.098	1.169			
20%<HPA	0.416	1.909	0.324			

Terminated Loans

	90 Uninsured			90 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	256	79	256	835	106	835
-20%<HPA<=0%	881	52	881	3,606	97	3,606
0%<HPA<=20%	1,123	37	1,123	11,721	214	11,721
20%<HPA	322	4	322	14,212	338	14,212
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	79	2	78	106	7	102
-20%<HPA<=0%	52	3	50	97	6	92
0%<HPA<=20%	37	4	33	214	41	191
20%<HPA	4	2	3	338	103	265
HPA Range	Response Rate			Response Rate		
HPA<=-20%	30.9%	2.5%	30.5%	12.7%	6.6%	12.2%
-20%<HPA<=0%	5.9%	5.8%	5.7%	2.7%	6.2%	2.6%
0%<HPA<=20%	3.3%	10.8%	2.9%	1.8%	19.2%	1.6%
20%<HPA	1.2%	50.0%	0.9%	2.4%	30.5%	1.9%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	2.431	0.383	2.494			
-20%<HPA<=0%	2.194	0.700	2.224			
0%<HPA<=20%	1.805	0.564	1.803			
20%<HPA	0.522	1.641	0.500			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 5 QRM loans excluding FHA, G>95 CLTV, and GSE
CLTV Cohort 95

Terminated and Active Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	582	157	582	708	128	708
-20%<HPA<=0%	1,944	184	1,944	2,725	146	2,725
0%<HPA<=20%	3,437	130	3,437	9,851	226	9,851
20%<HPA	2,650	49	2,650	10,940	227	10,940
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	157	16	146	128	9	122
-20%<HPA<=0%	184	43	157	146	20	133
0%<HPA<=20%	130	50	99	226	64	180
20%<HPA	49	25	29	227	74	177
HPA Range	Response Rate			Response Rate		
HPA<=-20%	27.0%	10.2%	25.1%	18.1%	6.3%	17.2%
-20%<HPA<=0%	9.5%	23.4%	8.1%	5.4%	13.7%	4.9%
0%<HPA<=20%	3.8%	38.5%	2.9%	2.3%	28.3%	1.8%
20%<HPA	1.8%	51.0%	1.1%	2.1%	32.6%	1.6%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	1.492	1.631	1.456			
-20%<HPA<=0%	1.767	1.706	1.655			
0%<HPA<=20%	1.649	1.358	1.576			
20%<HPA	0.891	1.565	0.676			

Terminated Loans

	95 Uninsured			95 Insured		
	Default 90	Cure Given Default 90	Default NC	Default 90	Cure Given Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	152	63	152	471	59	471
-20%<HPA<=0%	688	50	688	2,031	75	2,031
0%<HPA<=20%	1,112	39	1,112	8,430	157	8,430
20%<HPA	220	4	220	9,586	207	9,586
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	63	4	62	59	0	59
-20%<HPA<=0%	50	2	50	75	7	69
0%<HPA<=20%	39	5	39	157	32	135
20%<HPA	4	1	3	207	63	166
HPA Range	Response Rate			Response Rate		
HPA<=-20%	41.4%	6.3%	40.8%	12.5%	0.0%	12.5%
-20%<HPA<=0%	7.3%	4.0%	7.3%	3.7%	9.3%	3.4%
0%<HPA<=20%	3.5%	12.8%	3.5%	1.9%	20.4%	1.6%
20%<HPA	1.8%	25.0%	1.4%	2.2%	30.4%	1.7%
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	3.309	NA	3.256			
-20%<HPA<=0%	1.968	0.429	2.139			
0%<HPA<=20%	1.883	0.629	2.190			
20%<HPA	0.842	0.821	0.787			

Mortgage Insurance Companies of America
Loan Count and Empirical Default Rate Comparison
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
CLTV Cohort: GT95

Terminated and Active Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 90	Default 90	Default NC	Default 90	Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Terminated Loans

	GT95 Uninsured			GT95 Insured		
		Cure Given			Cure Given	
	Default 90	Default 90	Default NC	Default 90	Default 90	Default NC
HPA Range	Observed Loan Count			Observed Loan Count		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Number of Responses			Number of Responses		
HPA<=-20%	0	0	0	0	0	0
-20%<HPA<=0%	0	0	0	0	0	0
0%<HPA<=20%	0	0	0	0	0	0
20%<HPA	0	0	0	0	0	0
HPA Range	Response Rate			Response Rate		
HPA<=-20%	NA	NA	NA	NA	NA	NA
-20%<HPA<=0%	NA	NA	NA	NA	NA	NA
0%<HPA<=20%	NA	NA	NA	NA	NA	NA
20%<HPA	NA	NA	NA	NA	NA	NA
HPA Range	Ratio of Uninsured to Insured Rate					
HPA<=-20%	NA	NA	NA			
-20%<HPA<=0%	NA	NA	NA			
0%<HPA<=20%	NA	NA	NA			
20%<HPA	NA	NA	NA			

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1 All loans in the filtered dataset
Terminated and Active Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8567	< 0.0001	-4.3523	< 0.0001	-5.4168	< 0.0001	-6.1685	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5587	< 0.0001	0.5123	< 0.0001	0.5570	< 0.0001	0.6111	< 0.0001
		90 Uninsured	0.7371	< 0.0001	0.7944	< 0.0001	0.9001	< 0.0001	0.9701	< 0.0001
		95 Insured	0.7719	< 0.0001	0.6905	< 0.0001	0.6951	< 0.0001	0.7872	< 0.0001
		95 Uninsured	0.9951	< 0.0001	1.0010	< 0.0001	1.0949	< 0.0001	1.0694	< 0.0001
		GT95 Insured	0.7197	< 0.0001	0.7581	< 0.0001	0.8877	< 0.0001	0.9780	< 0.0001
		GT95 Uninsured	1.3309	< 0.0001	1.5573	< 0.0001	1.7937	< 0.0001	1.8029	< 0.0001
ficobucket	780-850	350 - 579	1.5381	< 0.0001	2.5216	< 0.0001	3.1599	< 0.0001	3.4566	< 0.0001
		580 - 599	1.3497	< 0.0001	2.2334	< 0.0001	2.7562	< 0.0001	3.0071	< 0.0001
		600 - 619	1.3174	< 0.0001	2.0576	< 0.0001	2.5453	< 0.0001	2.7632	< 0.0001
		620 - 659	1.2734	< 0.0001	1.8188	< 0.0001	2.1898	< 0.0001	2.3533	< 0.0001
		660 - 689	1.0571	< 0.0001	1.4841	< 0.0001	1.7042	< 0.0001	1.8060	< 0.0001
		690 - 719	0.8351	< 0.0001	1.1681	< 0.0001	1.2827	< 0.0001	1.3561	< 0.0001
		720 - 749	0.6344	< 0.0001	0.8277	< 0.0001	0.8504	< 0.0001	0.8472	< 0.0001
		750 - 779	0.3506	< 0.0001	0.3887	< 0.0001	0.3170	< 0.0001	0.3067	< 0.0001
proptyp	SFR	2-4U	0.0924	0.0036	0.4945	< 0.0001	0.3658	< 0.0001	0.4062	< 0.0001
		COND	0.1507	< 0.0001	-0.0768	< 0.0001	-0.2214	< 0.0001	-0.4240	< 0.0001
product	Fixed	ARM	-0.1113	< 0.0001	-0.0491	< 0.0001	-0.0522	< 0.0001	-0.0567	0.0002
source	Non-Retail	CORRESPOND	0.2162	< 0.0001	0.1469	< 0.0001	0.1671	< 0.0001	0.1372	< 0.0001
		OTHER	-1.7896	< 0.0001	-1.4067	< 0.0001	-0.5502	< 0.0001	0.1597	< 0.0001
		RETAIL	0.0569	< 0.0001	0.2104	< 0.0001	0.2454	< 0.0001	0.1853	< 0.0001
loanpurp	Purchase	C/O REFI	0.0948	< 0.0001	0.2350	< 0.0001	0.1714	< 0.0001	0.1993	< 0.0001
		R/T REFI	0.0821	< 0.0001	0.1254	< 0.0001	-0.0608	< 0.0001	-0.3939	< 0.0001
Doctype	Full	Low	0.4329	< 0.0001	0.5198	< 0.0001	0.5647	< 0.0001	0.5309	< 0.0001
intonly	No	YES	1.2992	< 0.0001	1.1379	< 0.0001	1.0000	< 0.0001	0.9221	< 0.0001
negam	No	YES	0.9615	< 0.0001	0.8963	< 0.0001	0.8304	< 0.0001	0.2745	< 0.0001
Term	360	< 360	-0.4211	< 0.0001	-0.1798	< 0.0001	-0.0425	0.0004	0.1745	< 0.0001
		> 360	0.4143	< 0.0001	0.7978	< 0.0001	0.9497	< 0.0001	0.9859	< 0.0001
Quintile_String	2	0	-0.1902	< 0.0001	0.0324	0.0012	0.1838	< 0.0001	0.2577	< 0.0001
		1	-0.0416	< 0.0001	0.0346	0.0004	0.0644	< 0.0001	0.1283	< 0.0001
		3	-0.0119	0.2570	0.0014	0.9000	-0.0216	0.0507	-0.0643	< 0.0001
		4	-0.0665	< 0.0001	0.0346	0.0098	0.1620	< 0.0001	0.1409	< 0.0001
owndcc	O	I	0.2835	< 0.0001	0.5356	< 0.0001	0.7414	< 0.0001	0.3226	< 0.0001
		S	0.0728	< 0.0001	0.2290	< 0.0001	0.4825	< 0.0001	-0.1107	0.0040
		U	-0.2607	< 0.0001	-0.1800	< 0.0001	0.0029	0.7932	0.0587	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1 All loans in the filtered dataset
Terminated and Active Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7706	< 0.0001	-4.2195	< 0.0001	-5.1956	< 0.0001	-5.7357	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5822	< 0.0001	0.5395	< 0.0001	0.5847	< 0.0001	0.6710	< 0.0001
		90 Uninsured	0.7590	< 0.0001	0.8142	< 0.0001	0.9317	< 0.0001	1.0457	< 0.0001
		95 Insured	0.7872	< 0.0001	0.7237	< 0.0001	0.7256	< 0.0001	0.8414	< 0.0001
		95 Uninsured	0.9971	< 0.0001	1.0326	< 0.0001	1.1129	< 0.0001	1.1299	< 0.0001
		GT95 Insured	0.7311	< 0.0001	0.7948	< 0.0001	0.8920	< 0.0001	0.9448	< 0.0001
		GT95 Uninsured	1.3722	< 0.0001	1.6061	< 0.0001	1.8300	< 0.0001	1.9161	< 0.0001
ficobucket	780-850	350 - 579	1.6436	< 0.0001	2.6587	< 0.0001	3.2753	< 0.0001	3.4212	< 0.0001
		580 - 599	1.4441	< 0.0001	2.3593	< 0.0001	2.8779	< 0.0001	2.9892	< 0.0001
		600 - 619	1.4201	< 0.0001	2.1737	< 0.0001	2.6655	< 0.0001	2.7510	< 0.0001
		620 - 659	1.3470	< 0.0001	1.9078	< 0.0001	2.2817	< 0.0001	2.3384	< 0.0001
		660 - 689	1.1123	< 0.0001	1.5275	< 0.0001	1.7580	< 0.0001	1.7673	< 0.0001
		690 - 719	0.8710	< 0.0001	1.1933	< 0.0001	1.3073	< 0.0001	1.2850	< 0.0001
		720 - 749	0.6531	< 0.0001	0.8350	< 0.0001	0.8609	< 0.0001	0.7884	< 0.0001
		750 - 779	0.3621	< 0.0001	0.3854	< 0.0001	0.3171	< 0.0001	0.2881	< 0.0001
proptyp	SFR	2-4U	0.1166	< 0.0001	0.4954	< 0.0001	0.3470	< 0.0001	0.3649	< 0.0001
		CONDO	0.1237	< 0.0001	-0.1085	< 0.0001	-0.2579	< 0.0001	-0.4244	< 0.0001
product	Fixed	ARM	-0.1132	< 0.0001	-0.0560	< 0.0001	-0.0887	< 0.0001	-0.1116	< 0.0001
source	Non-Retail	CORRESPOND	0.2325	< 0.0001	0.1512	< 0.0001	0.1637	< 0.0001	0.1884	< 0.0001
		OTHER	-1.7124	< 0.0001	-1.4081	< 0.0001	-0.4572	< 0.0001	0.3156	< 0.0001
		RETAIL	0.0480	< 0.0001	0.1938	< 0.0001	0.2029	< 0.0001	0.1304	< 0.0001
loanpurp	Purchase	C/O REFI	0.1175	< 0.0001	0.2381	< 0.0001	0.1404	< 0.0001	0.2265	< 0.0001
		R/T REFI	0.0910	< 0.0001	0.1291	< 0.0001	-0.0738	< 0.0001	-0.3736	< 0.0001
Doctype	Full	Low	0.4465	< 0.0001	0.5176	< 0.0001	0.5173	< 0.0001	0.4778	< 0.0001
intonly	No	YES	1.2585	< 0.0001	1.0531	< 0.0001	0.9048	< 0.0001	0.7361	< 0.0001
negam	No	YES	0.8881	< 0.0001	0.8059	< 0.0001	0.7846	< 0.0001	0.2200	< 0.0001
Term	360	< 360	-0.1312	< 0.0001	0.0788	< 0.0001	0.1366	< 0.0001	0.3182	< 0.0001
		> 360	0.6760	< 0.0001	1.1579	< 0.0001	1.2562	< 0.0001	1.2123	< 0.0001
Quintile_String	2	0	-0.2074	< 0.0001	0.0124	0.1875	0.1773	< 0.0001	0.2338	< 0.0001
		1	-0.0442	< 0.0001	0.0328	0.0003	0.0672	< 0.0001	0.1154	< 0.0001
		3	-0.0127	0.2182	-0.0037	0.7220	-0.0185	0.0613	-0.0572	< 0.0001
		4	-0.0803	< 0.0001	0.0188	0.1371	0.1359	< 0.0001	0.0934	< 0.0001
owndcc	O	I	0.2473	< 0.0001	0.4746	< 0.0001	0.6487	< 0.0001	0.2485	< 0.0001
		S	0.0373	0.0022	0.1989	< 0.0001	0.4349	< 0.0001	-0.0822	0.0078
		U	-0.1506	< 0.0001	-0.0441	0.0042	0.0918	< 0.0001	0.1338	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1 All loans in the filtered dataset
Terminated and Active Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.1765	< 0.0001	-1.4264	< 0.0001	-0.8291	< 0.0001	-0.1122	0.0725
CLTV	80 Uninsured	90 Insured	0.1323	< 0.0001	0.0908	< 0.0001	0.1281	< 0.0001	0.3088	< 0.0001
		90 Uninsured	0.0845	< 0.0001	0.0848	0.0003	0.2294	< 0.0001	0.5141	< 0.0001
		95 Insured	0.1408	< 0.0001	0.1924	< 0.0001	0.1885	< 0.0001	0.2892	< 0.0001
		95 Uninsured	0.0431	0.2203	0.1074	0.0004	0.1346	< 0.0001	0.4988	< 0.0001
		GT95 Insured	0.1741	< 0.0001	0.1353	< 0.0001	0.0562	0.0045	0.0302	0.2116
		GT95 Uninsured	0.0418	0.1205	0.1469	< 0.0001	0.2220	< 0.0001	0.5030	< 0.0001
ficobucket	780-850	350 - 579	1.4452	< 0.0001	1.1180	< 0.0001	0.7325	< 0.0001	0.0808	0.1808
		580 - 599	1.2597	< 0.0001	1.0738	< 0.0001	0.7048	< 0.0001	0.0876	0.1603
		600 - 619	1.0846	< 0.0001	0.9216	< 0.0001	0.6688	< 0.0001	0.0550	0.3725
		620 - 659	0.7849	< 0.0001	0.7035	< 0.0001	0.4855	< 0.0001	0.0082	0.8903
		660 - 689	0.5087	< 0.0001	0.4062	< 0.0001	0.2543	< 0.0001	-0.1388	0.0214
		690 - 719	0.3260	< 0.0001	0.2098	< 0.0001	0.1195	0.0090	-0.2329	0.0001
		720 - 749	0.1360	0.0023	0.0644	0.1756	0.0018	0.9697	-0.2502	< 0.0001
		750 - 779	0.0678	0.1492	-0.0359	0.4810	-0.0858	0.0937	-0.1539	0.0232
proptyp	SFR	2-4U	0.1188	0.0460	-0.1546	< 0.0001	-0.1554	< 0.0001	-0.2090	< 0.0001
		COND	-0.3013	< 0.0001	-0.2242	< 0.0001	-0.1697	< 0.0001	0.0000	0.9990
product	Fixed	ARM	-0.0535	0.0118	-0.1262	< 0.0001	-0.2011	< 0.0001	-0.2186	< 0.0001
source	Non-Retail	CORRESPOND	-0.0154	0.3978	-0.0091	0.5770	-0.0057	0.6861	0.2647	< 0.0001
		OTHER	1.1014	< 0.0001	0.3748	< 0.0001	0.8215	< 0.0001	1.0903	< 0.0001
		RETAIL	0.0257	0.1879	0.0302	0.0585	0.0806	< 0.0001	0.1716	< 0.0001
loanpurp	Purchase	C/O REFI	0.2328	< 0.0001	0.1183	< 0.0001	0.1654	< 0.0001	0.1853	< 0.0001
		R/T REFI	0.1318	< 0.0001	0.0199	0.2707	-0.0908	< 0.0001	-0.0870	< 0.0001
Doctype	Full	Low	0.0989	< 0.0001	NA	NA	-0.0734	< 0.0001	-0.0759	< 0.0001
intonly	No	YES	-0.3201	< 0.0001	-0.5380	< 0.0001	-0.4858	< 0.0001	-0.6820	< 0.0001
negam	No	YES	-0.4630	< 0.0001	-0.4853	< 0.0001	-0.2294	< 0.0001	NA	NA
Term	360	< 360	1.4251	< 0.0001	1.0882	< 0.0001	0.8886	< 0.0001	0.8323	< 0.0001
		> 360	0.8574	< 0.0001	0.9909	< 0.0001	1.1277	< 0.0001	1.0622	< 0.0001
Quintile_String	2	0	NA	NA	-0.0686	0.0003	-0.0437	0.0030	-0.0978	< 0.0001
		1	NA	NA	-0.0006	0.9735	-0.0105	0.4878	-0.0414	0.0322
		3	NA	NA	-0.0036	0.8674	-0.0335	0.0818	-0.0619	0.0182
		4	NA	NA	-0.0678	0.0135	-0.0942	0.0001	-0.1874	< 0.0001
owndcc	O	I	-0.3691	< 0.0001	-0.3869	< 0.0001	-0.4711	< 0.0001	-0.2950	< 0.0001
		S	-0.3014	< 0.0001	-0.2150	< 0.0001	-0.2225	< 0.0001	0.0693	0.2658
		U	0.4081	< 0.0001	0.5867	< 0.0001	0.2552	< 0.0001	0.1850	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1: All loans in the filtered dataset
Terminated Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7568	< 0.0001	-4.6224	< 0.0001	-5.5497	< 0.0001	-5.9902	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5027	< 0.0001	0.5945	< 0.0001	0.6432	< 0.0001	0.6039	< 0.0001
		90 Uninsured	1.1640	< 0.0001	1.0182	< 0.0001	1.0168	< 0.0001	1.0717	< 0.0001
		95 Insured	0.8283	< 0.0001	0.8326	< 0.0001	0.8554	< 0.0001	0.8147	< 0.0001
		95 Uninsured	1.4206	< 0.0001	1.1508	< 0.0001	1.1941	< 0.0001	1.0847	< 0.0001
		GT95 Insured	0.8817	< 0.0001	1.1796	< 0.0001	1.1684	< 0.0001	1.0102	< 0.0001
		GT95 Uninsured	1.6619	< 0.0001	1.7093	< 0.0001	1.8468	< 0.0001	1.8758	< 0.0001
ficobucket	780-850	350 - 579	1.2981	< 0.0001	2.4622	< 0.0001	3.1224	< 0.0001	3.2673	< 0.0001
		580 - 599	1.1123	< 0.0001	2.1351	< 0.0001	2.6688	< 0.0001	2.7500	< 0.0001
		600 - 619	1.0726	< 0.0001	1.9864	< 0.0001	2.4294	< 0.0001	2.5186	< 0.0001
		620 - 659	1.1120	< 0.0001	1.7705	< 0.0001	2.0777	< 0.0001	2.1058	< 0.0001
		660 - 689	0.9405	< 0.0001	1.4472	< 0.0001	1.6248	< 0.0001	1.5880	< 0.0001
		690 - 719	0.7401	< 0.0001	1.1350	< 0.0001	1.2176	< 0.0001	1.1621	< 0.0001
		720 - 749	0.5481	< 0.0001	0.7723	< 0.0001	0.7632	< 0.0001	0.6872	< 0.0001
		750 - 779	0.3284	< 0.0001	0.3277	< 0.0001	0.2392	< 0.0001	0.2122	< 0.0001
proptyp	SFR	2-4U	0.0522	0.1660	0.4020	< 0.0001	0.2764	< 0.0001	0.3978	< 0.0001
		COND	0.1614	< 0.0001	-0.1161	< 0.0001	-0.3150	< 0.0001	-0.4881	< 0.0001
product	Fixed	ARM	-0.4797	< 0.0001	-0.3072	< 0.0001	-0.3460	< 0.0001	-0.3407	< 0.0001
source	Non-Retail	CORRESPOND	0.5435	< 0.0001	0.3761	< 0.0001	0.6545	< 0.0001	0.9128	< 0.0001
		OTHER	-1.8810	< 0.0001	-1.4870	< 0.0001	-0.9291	< 0.0001	-0.4220	< 0.0001
		RETAIL	0.0289	0.0191	0.2207	< 0.0001	0.1815	< 0.0001	0.1028	< 0.0001
loanpurp	Purchase	C/O REFI	0.0683	< 0.0001	0.1712	< 0.0001	0.0568	0.0007	0.3214	< 0.0001
		R/T REFI	0.3220	< 0.0001	0.2811	< 0.0001	0.0387	0.0014	-0.4230	< 0.0001
Doctype	Full	Low	0.3760	< 0.0001	0.5915	< 0.0001	0.8196	< 0.0001	0.6909	< 0.0001
intonly	No	YES	1.6060	< 0.0001	1.3677	< 0.0001	0.8755	< 0.0001	0.5767	< 0.0001
negam	No	YES	0.6955	< 0.0001	0.6910	< 0.0001	0.6087	< 0.0001	NA	NA
Term	360	< 360	-0.8405	< 0.0001	-0.5579	< 0.0001	-0.2426	< 0.0001	0.0606	0.0018
		> 360	1.1316	< 0.0001	1.4571	< 0.0001	1.5873	< 0.0001	1.3218	< 0.0001
Quintile_String	2	0	-0.1683	< 0.0001	0.1865	< 0.0001	0.3808	< 0.0001	0.3542	< 0.0001
		1	-0.0180	0.2162	0.1025	< 0.0001	0.1471	< 0.0001	0.1634	< 0.0001
		3	-0.0354	0.0207	0.0010	0.9520	-0.0726	< 0.0001	-0.0406	0.0540
		4	-0.1126	< 0.0001	0.0658	0.0013	0.1369	< 0.0001	0.1689	< 0.0001
owndcc	O	I	0.5371	< 0.0001	0.9826	< 0.0001	1.1288	< 0.0001	0.4623	< 0.0001
		S	0.4046	< 0.0001	0.5832	< 0.0001	0.6585	< 0.0001	-0.1069	0.0381
		U	-0.3097	< 0.0001	-0.4286	< 0.0001	0.0458	0.0041	0.0584	0.0007

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1 All loans in the filtered dataset
Terminated Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7344	< 0.0001	-4.5505	< 0.0001	-5.3561	< 0.0001	-5.6671	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5236	< 0.0001	0.5979	< 0.0001	0.6214	< 0.0001	0.5929	< 0.0001
		90 Uninsured	1.1620	< 0.0001	1.0049	< 0.0001	0.9884	< 0.0001	1.1522	< 0.0001
		95 Insured	0.8376	< 0.0001	0.8327	< 0.0001	0.8151	< 0.0001	0.7913	< 0.0001
		95 Uninsured	1.4185	< 0.0001	1.1257	< 0.0001	1.1284	< 0.0001	1.0920	< 0.0001
		GT95 Insured	0.9196	< 0.0001	1.1816	< 0.0001	1.0971	< 0.0001	0.9369	< 0.0001
		GT95 Uninsured	1.6571	< 0.0001	1.6838	< 0.0001	1.7720	< 0.0001	1.9504	< 0.0001
ficobucket	780-850	350 - 579	1.3441	< 0.0001	2.5155	< 0.0001	3.1675	< 0.0001	3.2850	< 0.0001
		580 - 599	1.1469	< 0.0001	2.2094	< 0.0001	2.7274	< 0.0001	2.7817	< 0.0001
		600 - 619	1.1297	< 0.0001	2.0220	< 0.0001	2.4789	< 0.0001	2.5425	< 0.0001
		620 - 659	1.1328	< 0.0001	1.7881	< 0.0001	2.1028	< 0.0001	2.1124	< 0.0001
		660 - 689	0.9489	< 0.0001	1.4441	< 0.0001	1.6170	< 0.0001	1.5607	< 0.0001
		690 - 719	0.7441	< 0.0001	1.1261	< 0.0001	1.2029	< 0.0001	1.1175	< 0.0001
		720 - 749	0.5499	< 0.0001	0.7547	< 0.0001	0.7465	< 0.0001	0.6481	< 0.0001
		750 - 779	0.3275	< 0.0001	0.3092	< 0.0001	0.2165	< 0.0001	0.2053	< 0.0001
proptyp	SFR	2-4U	0.0641	0.0877	0.3990	< 0.0001	0.2942	< 0.0001	0.3919	< 0.0001
		COND	0.1629	< 0.0001	-0.1077	< 0.0001	-0.2823	< 0.0001	-0.4286	< 0.0001
product	Fixed	ARM	-0.4752	< 0.0001	-0.3074	< 0.0001	-0.3266	< 0.0001	-0.3114	< 0.0001
source	Non-Retail	CORRESPOND	0.5326	< 0.0001	0.3592	< 0.0001	0.6194	< 0.0001	0.8328	< 0.0001
		OTHER	-1.7638	< 0.0001	-1.3957	< 0.0001	-0.7923	< 0.0001	-0.3100	< 0.0001
		RETAIL	0.0168	0.1719	0.2263	< 0.0001	0.1663	< 0.0001	0.0788	< 0.0001
loanpurp	Purchase	C/O REFI	0.0635	< 0.0001	0.1507	< 0.0001	NA	NA	0.2997	< 0.0001
		R/T REFI	0.3177	< 0.0001	0.2605	< 0.0001	NA	NA	-0.4074	< 0.0001
Doctype	Full	Low	0.3867	< 0.0001	0.5889	< 0.0001	0.7633	< 0.0001	0.6071	< 0.0001
intonly	No	YES	1.5981	< 0.0001	1.3538	< 0.0001	0.8428	< 0.0001	0.4894	< 0.0001
negam	No	YES	0.6770	< 0.0001	0.6696	< 0.0001	0.5873	< 0.0001	-0.2224	0.0368
Term	360	< 360	-0.7004	< 0.0001	-0.3503	< 0.0001	-0.1212	< 0.0001	0.1582	< 0.0001
		> 360	1.2419	< 0.0001	1.6762	< 0.0001	1.8368	< 0.0001	1.5609	< 0.0001
Quintile_String	2	0	-0.1726	< 0.0001	0.1827	< 0.0001	0.3671	< 0.0001	0.3221	< 0.0001
		1	-0.0224	0.1224	0.0999	< 0.0001	0.1411	< 0.0001	0.1502	< 0.0001
		3	-0.0360	0.0180	0.0007	0.9682	-0.0713	< 0.0001	-0.0433	0.0204
		4	-0.1144	< 0.0001	0.0598	0.0029	0.1209	< 0.0001	0.1443	< 0.0001
owndcc	O	I	0.5342	< 0.0001	0.9585	< 0.0001	1.0529	< 0.0001	0.4121	< 0.0001
		S	0.4067	< 0.0001	0.5717	< 0.0001	0.6124	< 0.0001	-0.0490	0.2659
		U	-0.3368	< 0.0001	-0.4434	< 0.0001	0.0093	0.5412	0.0283	0.0686

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 1: All loans in the filtered dataset
Terminated Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.2684	< 0.0001	-2.0589	< 0.0001	-1.1580	< 0.0001	-0.5211	< 0.0001
CLTV	80 Uninsured	90 Insured	0.2366	< 0.0001	-0.0690	0.1520	-0.0669	0.0525	0.0968	0.0054
		90 Uninsured	0.0923	0.0514	-0.0658	0.2343	0.0427	0.4493	0.4581	< 0.0001
		95 Insured	0.2156	0.0054	0.0717	0.2283	-0.0920	0.0194	0.0342	0.3755
		95 Uninsured	0.1380	0.0838	0.1940	0.0080	0.2298	0.0007	0.2869	0.0045
		GT95 Insured	0.4225	< 0.0001	0.0835	0.0663	0.2940	< 0.0001	0.1856	< 0.0001
		GT95 Uninsured	0.1530	0.0079	-0.0938	0.0615	-0.0517	0.2013	0.5056	< 0.0001
ficobucket	780-850	350 - 579	1.9295	< 0.0001	1.0782	< 0.0001	0.6007	< 0.0001	0.2388	0.0050
		580 - 599	1.6577	< 0.0001	1.1344	< 0.0001	0.6733	< 0.0001	0.2490	0.0047
		600 - 619	1.4194	< 0.0001	0.9011	< 0.0001	0.5724	< 0.0001	0.1659	0.0567
		620 - 659	1.0187	< 0.0001	0.5764	< 0.0001	0.3223	< 0.0001	0.0853	0.3108
		660 - 689	0.6704	< 0.0001	0.2129	0.0188	0.0060	0.9354	-0.1313	0.1238
		690 - 719	0.3574	0.0003	-0.0082	0.9290	-0.0926	0.2170	-0.2060	0.0179
		720 - 749	0.0699	0.4927	-0.2016	0.0362	-0.1736	0.0264	-0.2332	0.0097
		750 - 779	-0.0405	0.7087	-0.2867	0.0062	-0.2256	0.0083	-0.1138	0.2363
proptyp	SFR	2-4U	0.2360	0.0421	NA	NA	-0.0276	0.6749	-0.0947	0.1132
		COND	-0.1424	0.0029	NA	NA	0.1753	< 0.0001	0.2498	< 0.0001
product	Fixed	ARM	-0.1294	0.0061	NA	NA	0.0736	0.0093	0.1081	0.0013
source	Non-Retail	CORRESPOND	-0.2252	< 0.0001	-0.0504	0.1382	-0.1181	< 0.0001	-0.1602	< 0.0001
		OTHER	1.4467	< 0.0001	0.6301	< 0.0001	0.7641	< 0.0001	0.6827	< 0.0001
		RETAIL	0.2921	< 0.0001	0.0822	0.0638	0.0389	0.0886	0.1074	< 0.0001
loanpurp	Purchase	C/O REFI	NA	NA	0.2042	< 0.0001	0.2643	< 0.0001	0.0542	0.1625
		R/T REFI	NA	NA	-0.2501	< 0.0001	-0.2348	< 0.0001	-0.1418	< 0.0001
Doctype	Full	Low	0.1547	< 0.0001	0.0741	0.0096	-0.2117	< 0.0001	-0.2574	< 0.0001
intonly	No	YES	-0.1745	0.0005	-0.4881	< 0.0001	-0.4668	< 0.0001	-0.5613	< 0.0001
negam	No	YES	-0.2611	< 0.0001	-0.6192	< 0.0001	-0.4029	< 0.0001	-0.5729	0.0098
Term	360	< 360	1.7124	< 0.0001	1.5573	< 0.0001	0.9702	< 0.0001	0.7097	< 0.0001
		> 360	0.8268	< 0.0001	1.4895	< 0.0001	2.1108	< 0.0001	2.1997	< 0.0001
Quintile_String	2	0	0.0767	0.1182	NA	NA	-0.0980	0.0002	-0.1222	< 0.0001
		1	-0.0343	0.4581	NA	NA	-0.0350	0.1910	-0.0321	0.2485
		3	0.0145	0.7734	NA	NA	-0.0240	0.4884	-0.0657	0.0845
		4	0.0847	0.1462	NA	NA	-0.0765	0.0837	-0.1524	0.0023
owndcc	O	I	-0.1753	0.0046	-0.2529	< 0.0001	-0.5357	< 0.0001	-0.2784	< 0.0001
		S	-0.0719	0.2634	-0.2037	0.0193	-0.2631	0.0003	-0.1634	0.0706
		U	-0.3951	0.0049	-0.0920	0.1787	-0.5351	< 0.0001	-0.3016	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8965	< 0.0001	-4.4280	< 0.0001	-5.5337	< 0.0001	-6.3297	< 0.0001
CLTV	80 Uninsured	90 Insured	0.6213	< 0.0001	0.6334	< 0.0001	0.6623	< 0.0001	0.6868	< 0.0001
		90 Uninsured	0.7341	< 0.0001	0.7665	< 0.0001	0.8294	< 0.0001	0.9102	< 0.0001
		95 Insured	0.8388	< 0.0001	0.8441	< 0.0001	0.8180	< 0.0001	0.8780	< 0.0001
		95 Uninsured	0.9859	< 0.0001	0.9551	< 0.0001	1.0170	< 0.0001	1.0547	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.8065	< 0.0001	2.7714	< 0.0001	3.3833	< 0.0001	3.5896	< 0.0001
		580 - 599	1.4222	< 0.0001	2.1854	< 0.0001	2.7103	< 0.0001	3.0201	< 0.0001
		600 - 619	1.3658	< 0.0001	1.9788	< 0.0001	2.4327	< 0.0001	2.7475	< 0.0001
		620 - 659	1.2822	< 0.0001	1.7807	< 0.0001	2.1525	< 0.0001	2.3299	< 0.0001
		660 - 689	1.0779	< 0.0001	1.5118	< 0.0001	1.7589	< 0.0001	1.8377	< 0.0001
		690 - 719	0.8491	< 0.0001	1.2023	< 0.0001	1.3494	< 0.0001	1.3648	< 0.0001
		720 - 749	0.6419	< 0.0001	0.8542	< 0.0001	0.9330	< 0.0001	0.8727	< 0.0001
		750 - 779	0.3572	< 0.0001	0.4071	< 0.0001	0.3782	< 0.0001	0.3209	< 0.0001
proptyp	SFR	2-4U	0.0955	0.0006	0.4884	< 0.0001	0.3979	< 0.0001	0.5332	< 0.0001
		COND	0.1388	< 0.0001	-0.0619	< 0.0001	-0.2230	< 0.0001	-0.4167	< 0.0001
product	Fixed	ARM	-0.1133	< 0.0001	-0.0771	< 0.0001	-0.1010	< 0.0001	-0.1697	< 0.0001
source	Non-Retail	CORRESPOND	0.2133	< 0.0001	0.1227	< 0.0001	0.1272	< 0.0001	-0.0058	0.7562
		OTHER	-1.8851	< 0.0001	-1.6269	< 0.0001	-0.8851	< 0.0001	-0.0447	0.2592
		RETAIL	0.0435	< 0.0001	0.1846	< 0.0001	0.2150	< 0.0001	0.2457	< 0.0001
loanpurp	Purchase	C/O REFI	0.1083	< 0.0001	0.3128	< 0.0001	0.3558	< 0.0001	0.1115	< 0.0001
		R/T REFI	0.1219	< 0.0001	0.2446	< 0.0001	0.1683	< 0.0001	-0.0124	0.4342
Doctype	Full	Low	0.4716	< 0.0001	0.5878	< 0.0001	0.6733	< 0.0001	0.7279	< 0.0001
intonly	No	YES	1.3247	< 0.0001	1.2718	< 0.0001	1.2182	< 0.0001	1.1199	< 0.0001
negam	No	YES	0.9541	< 0.0001	0.9047	< 0.0001	0.8646	< 0.0001	0.3850	< 0.0001
Term	360	< 360	-0.4609	< 0.0001	-0.3774	< 0.0001	-0.4170	< 0.0001	-0.3033	< 0.0001
		> 360	0.3672	< 0.0001	0.5968	< 0.0001	0.5398	< 0.0001	0.5396	< 0.0001
Quintile_String	2	0	-0.1741	< 0.0001	0.0476	0.0002	0.2271	< 0.0001	0.3519	< 0.0001
		1	-0.0439	< 0.0001	0.0381	0.0013	0.0756	< 0.0001	0.1737	< 0.0001
		3	-0.0207	0.0592	-0.0104	0.4050	-0.0161	0.2611	-0.0187	0.3943
		4	-0.0734	< 0.0001	0.0076	0.5960	0.1455	< 0.0001	0.2229	< 0.0001
owndcc	O	I	0.2774	< 0.0001	0.5090	< 0.0001	0.6931	< 0.0001	0.3466	< 0.0001
		S	0.0617	< 0.0001	0.1946	< 0.0001	0.4456	< 0.0001	-0.0698	0.0769
		U	-0.0200	0.6046	-0.1227	0.0002	-0.0065	0.8443	-0.2099	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8100	< 0.0001	-4.2873	< 0.0001	-5.2727	< 0.0001	-5.8430	< 0.0001
CLTV	80 Uninsured	90 Insured	0.6494	< 0.0001	0.6616	< 0.0001	0.6821	< 0.0001	0.7501	< 0.0001
		90 Uninsured	0.7544	< 0.0001	0.7840	< 0.0001	0.8584	< 0.0001	0.9841	< 0.0001
		95 Insured	0.8596	< 0.0001	0.8773	< 0.0001	0.8381	< 0.0001	0.9469	< 0.0001
		95 Uninsured	0.9840	< 0.0001	0.9829	< 0.0001	1.0267	< 0.0001	1.1008	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.9039	< 0.0001	2.9288	< 0.0001	3.4904	< 0.0001	3.5573	< 0.0001
		580 - 599	1.5357	< 0.0001	2.3187	< 0.0001	2.8500	< 0.0001	3.0140	< 0.0001
		600 - 619	1.4505	< 0.0001	2.1126	< 0.0001	2.5712	< 0.0001	2.7351	< 0.0001
		620 - 659	1.3483	< 0.0001	1.8662	< 0.0001	2.2267	< 0.0001	2.2868	< 0.0001
		660 - 689	1.1198	< 0.0001	1.5496	< 0.0001	1.7914	< 0.0001	1.7655	< 0.0001
		690 - 719	0.8824	< 0.0001	1.2221	< 0.0001	1.3559	< 0.0001	1.2639	< 0.0001
		720 - 749	0.6572	< 0.0001	0.8584	< 0.0001	0.9223	< 0.0001	0.7816	< 0.0001
		750 - 779	0.3649	< 0.0001	0.4067	< 0.0001	0.3611	< 0.0001	0.2758	< 0.0001
proptyp	SFR	2-4U	0.1158	< 0.0001	0.4929	< 0.0001	0.3814	< 0.0001	0.4830	< 0.0001
		COND	0.1127	< 0.0001	-0.0929	< 0.0001	-0.2529	< 0.0001	-0.3907	< 0.0001
product	Fixed	ARM	-0.1213	< 0.0001	-0.0854	< 0.0001	-0.1331	< 0.0001	-0.2336	< 0.0001
source	Non-Retail	CORRESPOND	0.2311	< 0.0001	0.1283	< 0.0001	0.1398	< 0.0001	0.1126	< 0.0001
		OTHER	-1.8084	< 0.0001	-1.6138	< 0.0001	-0.7675	< 0.0001	0.1099	0.0004
		RETAIL	0.0300	0.0007	0.1893	< 0.0001	0.1775	< 0.0001	0.2068	< 0.0001
loanpurp	Purchase	C/O REFI	0.1335	< 0.0001	0.3518	< 0.0001	0.3253	< 0.0001	0.0814	< 0.0001
		R/T REFI	0.1354	< 0.0001	0.2515	< 0.0001	0.1482	< 0.0001	0.0006	0.9656
Doctype	Full	Low	0.4848	< 0.0001	0.5885	< 0.0001	0.6307	< 0.0001	0.6669	< 0.0001
intonly	No	YES	1.3030	< 0.0001	1.1983	< 0.0001	1.1245	< 0.0001	0.9374	< 0.0001
negam	No	YES	0.8914	< 0.0001	0.8174	< 0.0001	0.8175	< 0.0001	0.3942	< 0.0001
Term	360	< 360	-0.1947	< 0.0001	-0.1452	< 0.0001	-0.2854	< 0.0001	-0.1846	< 0.0001
		> 360	0.5935	< 0.0001	0.8974	< 0.0001	0.7609	< 0.0001	0.6510	< 0.0001
Quintile_String	2	0	-0.1904	< 0.0001	0.0242	0.0419	0.2114	< 0.0001	0.3239	< 0.0001
		1	-0.0459	< 0.0001	0.0330	0.0031	0.0745	< 0.0001	0.1663	< 0.0001
		3	-0.0205	0.0565	-0.0158	0.1789	-0.0249	0.0506	-0.0194	0.2732
		4	-0.0872	< 0.0001	-0.0070	0.6081	0.1114	< 0.0001	0.1571	< 0.0001
owndcc	O	I	0.2395	< 0.0001	0.4483	< 0.0001	0.6021	< 0.0001	0.2686	< 0.0001
		S	0.0243	0.0489	0.1645	< 0.0001	0.3935	< 0.0001	-0.0492	0.1197
		U	0.0787	0.0269	0.0078	0.7890	0.0724	0.0101	-0.1040	0.0096

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.1606	< 0.0001	-1.4107	< 0.0001	-0.7495	< 0.0001	-0.0338	0.6482
CLTV	80 Uninsured	90 Insured	0.1290	< 0.0001	0.0734	0.0013	0.1010	< 0.0001	0.3259	< 0.0001
		90 Uninsured	0.0711	0.0007	0.0666	0.0044	0.2040	< 0.0001	0.4693	< 0.0001
		95 Insured	0.1467	< 0.0001	0.1724	< 0.0001	0.1777	< 0.0001	0.3386	< 0.0001
		95 Uninsured	0.0793	0.0238	0.0821	0.0071	0.0897	0.0066	0.4063	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.3991	< 0.0001	1.2452	< 0.0001	0.8271	< 0.0001	0.2773	0.0009
		580 - 599	1.0975	< 0.0001	1.1577	< 0.0001	0.8112	< 0.0001	0.2509	0.0052
		600 - 619	1.0413	< 0.0001	0.9434	< 0.0001	0.7750	< 0.0001	0.1877	0.0211
		620 - 659	0.7347	< 0.0001	0.6920	< 0.0001	0.4506	< 0.0001	-0.0194	0.7844
		660 - 689	0.4810	< 0.0001	0.3989	< 0.0001	0.2269	< 0.0001	-0.1779	0.0121
		690 - 719	0.2960	< 0.0001	0.2022	< 0.0001	0.0854	0.1113	-0.2887	< 0.0001
		720 - 749	0.1154	0.0156	0.0542	0.3096	-0.0642	0.2467	-0.3178	< 0.0001
		750 - 779	0.0435	0.3871	-0.0349	0.5401	-0.1222	0.0405	-0.1924	0.0148
proptyp	SFR	2-4U	0.1136	0.0727	-0.1095	0.0054	-0.1666	0.0006	-0.1912	0.0017
		COND	-0.2697	< 0.0001	-0.2029	< 0.0001	-0.1466	< 0.0001	0.0477	0.2922
product	Fixed	ARM	-0.1353	< 0.0001	-0.1373	< 0.0001	-0.1768	< 0.0001	-0.2323	< 0.0001
source	Non-Retail	CORRESPOND	-0.0133	0.5139	0.0122	0.5498	0.0426	0.0380	0.4321	< 0.0001
		OTHER	1.1801	< 0.0001	0.3490	0.0012	0.7126	< 0.0001	0.8245	< 0.0001
		RETAIL	0.0092	0.6598	0.0144	0.4702	0.0764	< 0.0001	0.1646	< 0.0001
loanpurp	Purchase	C/O REFI	0.2398	< 0.0001	0.1190	< 0.0001	0.1819	< 0.0001	0.1889	< 0.0001
		R/T REFI	0.1429	< 0.0001	0.0200	0.3403	-0.1181	< 0.0001	-0.0595	0.0195
Doctype	Full	Low	0.0895	< 0.0001	0.0347	0.0453	-0.0631	0.0002	-0.1329	< 0.0001
intonly	No	YES	-0.1245	< 0.0001	-0.4558	< 0.0001	-0.4192	< 0.0001	-0.7028	< 0.0001
negam	No	YES	-0.3529	< 0.0001	-0.4732	< 0.0001	-0.2321	< 0.0001	NA	NA
term	360	< 360	1.3251	< 0.0001	0.8384	< 0.0001	0.5538	< 0.0001	0.4532	< 0.0001
		> 360	0.7399	< 0.0001	0.7879	< 0.0001	0.7871	< 0.0001	0.7640	< 0.0001
Quintile_String	2	0	NA	NA	-0.0925	0.0003	-0.0592	0.0151	-0.0719	0.0236
		1	NA	NA	-0.0065	0.7803	-0.0061	0.8014	-0.0072	0.8228
		3	NA	NA	0.0075	0.7621	-0.0449	0.0803	-0.0583	0.0985
		4	NA	NA	-0.0573	0.0525	-0.1035	0.0003	-0.2114	< 0.0001
owndcc	O	I	-0.4063	< 0.0001	-0.3892	< 0.0001	-0.4788	< 0.0001	-0.3321	< 0.0001
		S	-0.3298	< 0.0001	-0.2242	< 0.0001	-0.2657	< 0.0001	0.0217	0.7345
		U	0.1842	0.0192	0.3939	< 0.0001	0.2203	< 0.0001	0.2667	0.0010

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7968	< 0.0001	-4.6801	< 0.0001	-5.6640	< 0.0001	-6.2129	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5818	< 0.0001	0.7249	< 0.0001	0.7692	< 0.0001	0.7293	< 0.0001
		90 Uninsured	1.1585	< 0.0001	0.9770	< 0.0001	0.9304	< 0.0001	1.0046	< 0.0001
		95 Insured	0.9126	< 0.0001	0.9925	< 0.0001	0.9991	< 0.0001	0.9746	< 0.0001
		95 Uninsured	1.4016	< 0.0001	1.0895	< 0.0001	1.1239	< 0.0001	1.0901	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.4535	< 0.0001	2.5941	< 0.0001	3.2957	< 0.0001	3.3865	< 0.0001
		580 - 599	1.1355	< 0.0001	2.0518	< 0.0001	2.4460	< 0.0001	2.7021	< 0.0001
		600 - 619	1.0928	< 0.0001	1.9135	< 0.0001	2.2364	< 0.0001	2.3849	< 0.0001
		620 - 659	1.1386	< 0.0001	1.7423	< 0.0001	2.0263	< 0.0001	2.0734	< 0.0001
		660 - 689	0.9583	< 0.0001	1.4837	< 0.0001	1.6612	< 0.0001	1.6043	< 0.0001
		690 - 719	0.7568	< 0.0001	1.1751	< 0.0001	1.2869	< 0.0001	1.1659	< 0.0001
		720 - 749	0.5583	< 0.0001	0.8022	< 0.0001	0.8440	< 0.0001	0.7228	< 0.0001
		750 - 779	0.3373	< 0.0001	0.3431	< 0.0001	0.2971	< 0.0001	0.2258	0.0002
proptyp	SFR	2-4U	0.0652	0.0955	0.4364	< 0.0001	0.3555	< 0.0001	0.5135	< 0.0001
		COND	0.1377	< 0.0001	-0.0841	< 0.0001	-0.2987	< 0.0001	-0.4529	< 0.0001
product	Fixed	ARM	-0.5091	< 0.0001	-0.3803	< 0.0001	-0.4150	< 0.0001	-0.4857	< 0.0001
source	Non-Retail	CORRESPOND	0.5177	< 0.0001	0.2752	< 0.0001	0.4446	< 0.0001	0.5162	< 0.0001
		OTHER	-1.9532	< 0.0001	-1.6335	< 0.0001	-1.1285	< 0.0001	-0.4485	< 0.0001
		RETAIL	0.0197	0.1443	0.2480	< 0.0001	0.2264	< 0.0001	0.2365	< 0.0001
loanpurp	Purchase	C/O REFI	0.0848	< 0.0001	0.2725	< 0.0001	0.2914	< 0.0001	0.0317	0.2059
		R/T REFI	0.3683	< 0.0001	0.4264	< 0.0001	0.3376	< 0.0001	0.0588	0.0058
Doctype	Full	Low	0.3952	< 0.0001	0.6075	< 0.0001	0.9339	< 0.0001	0.9656	< 0.0001
intonly	No	YES	1.7410	< 0.0001	1.6203	< 0.0001	1.1925	< 0.0001	0.9592	< 0.0001
negam	No	YES	0.7465	< 0.0001	0.7710	< 0.0001	0.6342	< 0.0001	NA	NA
Term	360	< 360	-0.8845	< 0.0001	-0.7486	< 0.0001	-0.6197	< 0.0001	-0.3720	< 0.0001
		> 360	1.0965	< 0.0001	1.3376	< 0.0001	1.1560	< 0.0001	0.3280	0.1600
Quintile_String	2	0	-0.1561	< 0.0001	0.2083	< 0.0001	0.4152	< 0.0001	0.4383	< 0.0001
		1	-0.0268	0.0912	0.1088	< 0.0001	0.1505	< 0.0001	0.1849	< 0.0001
		3	-0.0488	0.0024	-0.0164	0.3979	-0.0440	0.0336	-0.0110	0.6993
		4	-0.1265	< 0.0001	0.0354	0.1102	0.1382	< 0.0001	0.2527	< 0.0001
owndcc	O	I	0.5341	< 0.0001	0.9430	< 0.0001	1.0783	< 0.0001	0.5029	< 0.0001
		S	0.3989	< 0.0001	0.5562	< 0.0001	0.6384	< 0.0001	-0.0420	0.4258
		U	0.1174	0.0630	-0.5309	< 0.0001	-0.1504	0.0091	-0.3302	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7744	< 0.0001	-4.6010	< 0.0001	-5.4526	< 0.0001	-5.8145	< 0.0001
CLTV	80 Uninsured	90 Insured	0.6032	< 0.0001	0.7243	< 0.0001	0.7365	< 0.0001	0.7173	< 0.0001
		90 Uninsured	1.1552	< 0.0001	0.9628	< 0.0001	0.9056	< 0.0001	1.0802	< 0.0001
		95 Insured	0.9199	< 0.0001	0.9864	< 0.0001	0.9518	< 0.0001	0.9362	< 0.0001
		95 Uninsured	1.3982	< 0.0001	1.0835	< 0.0001	1.0644	< 0.0001	1.0830	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.5039	< 0.0001	2.6738	< 0.0001	3.3495	< 0.0001	3.4037	< 0.0001
		580 - 599	1.1811	< 0.0001	2.1653	< 0.0001	2.5566	< 0.0001	2.7707	< 0.0001
		600 - 619	1.1663	< 0.0001	1.9653	< 0.0001	2.3046	< 0.0001	2.4335	< 0.0001
		620 - 659	1.1574	< 0.0001	1.7557	< 0.0001	2.0371	< 0.0001	2.0633	< 0.0001
		660 - 689	0.9567	< 0.0001	1.4731	< 0.0001	1.6343	< 0.0001	1.5563	< 0.0001
		690 - 719	0.7607	< 0.0001	1.1595	< 0.0001	1.2544	< 0.0001	1.0995	< 0.0001
		720 - 749	0.5596	< 0.0001	0.7809	< 0.0001	0.8115	< 0.0001	0.6592	< 0.0001
		750 - 779	0.3372	< 0.0001	0.3237	< 0.0001	0.2612	< 0.0001	0.2019	0.0001
proptyp	SFR	2-4U	0.0810	0.0376	0.4339	< 0.0001	0.3803	< 0.0001	0.4915	< 0.0001
		COND	0.1399	< 0.0001	-0.0799	< 0.0001	-0.2774	< 0.0001	-0.4068	< 0.0001
product	Fixed	ARM	-0.5133	< 0.0001	-0.3787	< 0.0001	-0.3974	< 0.0001	-0.4695	< 0.0001
source	Non-Retail	CORRESPOND	0.5074	< 0.0001	0.2598	< 0.0001	0.4292	< 0.0001	0.5098	< 0.0001
		OTHER	-1.8336	< 0.0001	-1.5397	< 0.0001	-0.9579	< 0.0001	-0.3461	< 0.0001
		RETAIL	0.0114	0.3959	0.2481	< 0.0001	0.2124	< 0.0001	0.2318	< 0.0001
loanpurp	Purchase	C/O REFI	0.0824	< 0.0001	0.2556	< 0.0001	0.2532	< 0.0001	NA	NA
		R/T REFI	0.3675	< 0.0001	0.4091	< 0.0001	0.2950	< 0.0001	NA	NA
Doctype	Full	Low	0.4047	< 0.0001	0.6077	< 0.0001	0.8747	< 0.0001	0.8637	< 0.0001
intonly	No	YES	1.7311	< 0.0001	1.5965	< 0.0001	1.1512	< 0.0001	0.8562	< 0.0001
negam	No	YES	0.7311	< 0.0001	0.7468	< 0.0001	0.6076	< 0.0001	NA	NA
Term	360	< 360	-0.8028	< 0.0001	-0.6063	< 0.0001	-0.5095	< 0.0001	-0.2728	< 0.0001
		> 360	1.1754	< 0.0001	1.4276	< 0.0001	1.2285	< 0.0001	0.4400	0.0272
Quintile_String	2	0	-0.1570	< 0.0001	0.2029	< 0.0001	0.3916	< 0.0001	0.3975	< 0.0001
		1	-0.0307	0.0519	0.1039	< 0.0001	0.1426	< 0.0001	0.1719	< 0.0001
		3	-0.0485	0.0024	-0.0159	0.4049	-0.0451	0.0208	-0.0013	0.9589
		4	-0.1276	< 0.0001	0.0314	0.1500	0.1220	< 0.0001	0.2121	< 0.0001
owndcc	O	I	0.5293	< 0.0001	0.9189	< 0.0001	1.0126	< 0.0001	0.4331	< 0.0001
		S	0.4009	< 0.0001	0.5465	< 0.0001	0.6011	< 0.0001	0.0003	0.9941
		U	0.1016	0.1057	-0.5168	< 0.0001	-0.1344	0.0106	-0.3445	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 2 All loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.1942	< 0.0001	-2.0078	< 0.0001	-0.9919	< 0.0001	-0.3299	0.0013
CLTV	80 Uninsured	90 Insured	0.2560	< 0.0001	-0.0862	0.0901	-0.0816	0.0283	0.0915	0.0191
		90 Uninsured	0.0492	0.2858	-0.1021	0.0657	0.0478	0.3971	0.4365	< 0.0001
		95 Insured	0.2250	0.0046	0.0190	0.7673	-0.0864	0.0478	0.0488	0.2719
		95 Uninsured	0.0854	0.2483	0.2438	0.0009	0.2228	0.0010	0.2342	0.0224
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.8440	< 0.0001	1.2881	< 0.0001	0.6663	< 0.0001	0.3476	0.0032
		580 - 599	1.5924	< 0.0001	1.2705	< 0.0001	0.7914	< 0.0001	0.2767	0.0288
		600 - 619	1.4721	< 0.0001	0.9235	< 0.0001	0.5524	< 0.0001	0.2048	0.0763
		620 - 659	0.9691	< 0.0001	0.5168	< 0.0001	0.1863	0.0290	-0.0101	0.9182
		660 - 689	0.6430	< 0.0001	0.1731	0.0877	-0.0491	0.5643	-0.2244	0.0231
		690 - 719	0.3295	0.0019	-0.0207	0.8396	-0.1506	0.0801	-0.3073	0.0022
		720 - 749	0.0440	0.6924	-0.2077	0.0527	-0.2449	0.0062	-0.3445	0.0009
		750 - 779	-0.0375	0.7497	-0.3054	0.0089	-0.2404	0.0132	-0.1692	0.1241
proptyp	SFR	2-4U	0.3107	0.0114	NA	NA	NA	NA	-0.1386	0.0915
		COND	-0.0424	0.4126	NA	NA	NA	NA	0.1960	0.0018
product	Fixed	ARM	-0.2829	< 0.0001	NA	NA	NA	NA	NA	NA
source	Non-Retail	CORRESPOND	-0.2867	< 0.0001	-0.0650	0.1549	-0.1586	< 0.0001	0.0946	0.0724
		OTHER	1.6119	< 0.0001	0.6247	< 0.0001	0.8090	< 0.0001	0.5892	< 0.0001
		RETAIL	0.2296	< 0.0001	0.0019	0.9651	0.0041	0.9065	0.0759	0.0413
loanpurp	Purchase	C/O REFI	NA	NA	0.1944	< 0.0001	0.2817	< 0.0001	0.0857	0.0548
		R/T REFI	NA	NA	-0.2620	< 0.0001	-0.2925	< 0.0001	-0.2041	< 0.0001
Doctype	Full	Low	0.1372	0.0011	0.1031	0.0075	-0.2180	< 0.0001	-0.2965	< 0.0001
intonly	No	YES	NA	NA	-0.5127	< 0.0001	-0.3343	< 0.0001	-0.4933	0.0003
negam	No	YES	NA	NA	-0.5524	< 0.0001	-0.3105	0.0002	-0.5007	0.0261
Term	360	< 360	1.3314	< 0.0001	1.0425	< 0.0001	0.6586	< 0.0001	0.3722	< 0.0001
		> 360	0.4524	< 0.0001	0.7351	< 0.0001	1.0159	< 0.0001	1.6047	0.0002
Quintile_String	2	0	NA	NA	NA	NA	-0.1772	< 0.0001	-0.1659	0.0004
		1	NA	NA	NA	NA	-0.0689	0.1176	-0.0639	0.1766
		3	NA	NA	NA	NA	-0.0454	0.3293	-0.0522	0.3056
		4	NA	NA	NA	NA	-0.0724	0.1562	-0.1838	0.0013
owndcc	O	I	-0.2469	< 0.0001	-0.2591	< 0.0001	-0.5056	< 0.0001	-0.2826	< 0.0001
		S	-0.1279	0.0523	-0.2272	0.0103	-0.2685	0.0003	0.1351	0.1435
		U	-0.7015	0.0253	0.1369	0.4419	-0.0680	0.5800	0.0516	0.6966

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8946	< 0.0001	-4.7926	< 0.0001	-5.6952	< 0.0001	-6.5152	< 0.0001
CLTV	80 Uninsured	90 Insured	0.6053	< 0.0001	0.7270	< 0.0001	0.5396	< 0.0001	0.6315	< 0.0001
		90 Uninsured	0.5846	< 0.0001	0.7444	< 0.0001	0.6314	< 0.0001	0.4525	0.0001
		95 Insured	0.7791	< 0.0001	0.8788	< 0.0001	0.5933	< 0.0001	0.7749	< 0.0001
		95 Uninsured	0.7804	< 0.0001	0.8889	< 0.0001	0.7079	< 0.0001	0.6325	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.8974	< 0.0001	1.3321	< 0.0001	1.2739	< 0.0001	1.5602	< 0.0001
		720 - 749	0.6986	< 0.0001	0.9647	< 0.0001	0.8244	< 0.0001	1.0240	< 0.0001
		750 - 779	0.3972	< 0.0001	0.4780	< 0.0001	0.2442	0.0002	0.3318	0.0007
proptyp	SFR	2-4U	0.2174	0.1713	0.8203	< 0.0001	0.4456	< 0.0001	0.8357	< 0.0001
		CONDO	0.3363	< 0.0001	0.0897	0.0460	-0.2627	< 0.0001	-0.3802	< 0.0001
product	Fixed	ARM	-0.9632	< 0.0001	-0.7127	< 0.0001	-0.3375	< 0.0001	-0.3499	0.0019
source	Non-Retail	CORRESPOND	0.2521	< 0.0001	0.2460	< 0.0001	0.3912	< 0.0001	0.0206	0.6837
		OTHER	-1.2243	< 0.0001	-1.4478	< 0.0001	-1.0457	< 0.0001	-0.3075	0.0226
		RETAIL	0.0854	0.0837	0.0812	0.0968	0.0107	0.7715	0.2046	< 0.0001
loanpurp	Purchase	C/O REFI	0.1213	0.0010	0.4161	< 0.0001	0.4622	< 0.0001	0.1332	0.0133
		R/T REFI	0.0712	0.0935	0.3265	< 0.0001	0.1750	< 0.0001	-0.0661	0.1658
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	-0.4778	< 0.0001	-0.2676	< 0.0001	-0.4399	< 0.0001	-0.3619	< 0.0001
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.1791	< 0.0001	0.1927	< 0.0001	0.5312	< 0.0001	0.5821	< 0.0001
		1	-0.0310	0.4562	0.0396	0.3396	0.2230	< 0.0001	0.2610	< 0.0001
		3	-0.0551	0.1980	-0.1347	0.0028	-0.1072	0.0222	-0.1291	0.0431
		4	-0.1323	0.0083	-0.1731	0.0015	-0.0685	0.1957	0.0253	0.7247
ownocc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.7903	< 0.0001	-4.6652	< 0.0001	-5.4388	< 0.0001	-6.0133	< 0.0001
CLTV	80 Uninsured	90 Insured	0.6097	< 0.0001	0.7313	< 0.0001	0.5597	< 0.0001	0.6717	< 0.0001
		90 Uninsured	0.6001	< 0.0001	0.7480	< 0.0001	0.6470	< 0.0001	0.5305	< 0.0001
		95 Insured	0.8019	< 0.0001	0.9193	< 0.0001	0.6597	< 0.0001	0.8069	< 0.0001
		95 Uninsured	0.8016	< 0.0001	0.9200	< 0.0001	0.7133	< 0.0001	0.6412	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.9019	< 0.0001	1.3725	< 0.0001	1.3018	< 0.0001	1.4389	< 0.0001
		720 - 749	0.6954	< 0.0001	0.9748	< 0.0001	0.8163	< 0.0001	0.9258	< 0.0001
		750 - 779	0.3918	< 0.0001	0.4798	< 0.0001	0.2102	0.0003	0.2878	0.0001
proptyp	SFR	2-4U	0.2462	0.1016	0.7791	< 0.0001	0.4746	< 0.0001	0.7535	< 0.0001
		COND	0.3015	< 0.0001	0.0465	0.2682	-0.2705	< 0.0001	-0.3819	< 0.0001
product	Fixed	ARM	-0.9164	< 0.0001	-0.6234	< 0.0001	-0.3743	< 0.0001	-0.4324	< 0.0001
source	Non-Retail	CORRESPOND	0.2559	< 0.0001	0.2567	< 0.0001	0.3992	< 0.0001	0.2020	< 0.0001
		OTHER	-1.1044	< 0.0001	-1.5822	< 0.0001	-0.8463	< 0.0001	-0.0151	0.8746
		RETAIL	0.0876	0.0449	0.0176	0.6022	0.0405	0.2077	0.1352	0.0003
loanpurp	Purchase	C/O REFI	0.1600	< 0.0001	0.4174	< 0.0001	0.4339	< 0.0001	0.1164	0.0071
		R/T REFI	0.0977	0.0146	0.3093	< 0.0001	0.1679	< 0.0001	-0.0441	0.2418
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	-0.1916	0.0005	NA	NA	-0.2928	< 0.0001	-0.2317	< 0.0001
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.1955	< 0.0001	0.1741	< 0.0001	0.4859	< 0.0001	0.5079	< 0.0001
		1	-0.0361	0.3627	0.0522	0.1696	0.2154	< 0.0001	0.2050	< 0.0001
		3	-0.0610	0.1342	-0.1272	0.0020	-0.1361	0.0009	-0.1240	0.0129
		4	-0.1759	0.0003	-0.1596	0.0013	-0.0639	0.1638	0.0068	0.9041
ownocc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.0766	< 0.0001	-1.5582	< 0.0001	-0.8165	< 0.0001	-0.3114	< 0.0001
CLTV	80 Uninsured	90 Insured	NA	NA	NA	NA	0.0447	0.5011	0.1366	0.0691
		90 Uninsured	NA	NA	NA	NA	-0.0149	0.9035	0.4868	0.0087
		95 Insured	NA	NA	NA	NA	0.2284	0.0020	0.1853	0.0231
		95 Uninsured	NA	NA	NA	NA	0.1087	0.3634	0.0381	0.8419
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	NA	NA	0.5098	0.0002	0.0579	0.5870	NA	NA
		720 - 749	NA	NA	0.2523	0.0740	-0.1257	0.2590	NA	NA
		750 - 779	NA	NA	0.1405	0.3510	-0.1691	0.1648	NA	NA
proptyp	SFR	2-4U	0.4767	0.1711	-0.3706	0.0344	NA	NA	-0.4503	0.0074
		COND	-0.3179	0.0073	-0.3635	0.0003	NA	NA	-0.0249	0.8408
product	Fixed	ARM	0.4476	0.0092	NA	NA	-0.3488	0.0396	-0.4148	0.0391
source	Non-Retail	CORRESPOND	NA	NA	NA	NA	0.1077	0.0967	0.6418	< 0.0001
		OTHER	NA	NA	NA	NA	0.5432	0.0081	0.7216	0.0003
		RETAIL	NA	NA	NA	NA	0.1048	0.1181	0.2289	0.0025
loanpurp	Purchase	C/O REFI	0.3147	0.0003	NA	NA	NA	NA	0.2900	0.0008
		R/T REFI	0.3386	0.0006	NA	NA	NA	NA	-0.0358	0.6348
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
term	360	< 360	1.4240	< 0.0001	1.0032	< 0.0001	0.4784	< 0.0001	0.3947	< 0.0001
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.0594	0.6162	NA	NA	NA	NA	NA	NA
		1	-0.0259	0.8069	NA	NA	NA	NA	NA	NA
		3	0.1147	0.2817	NA	NA	NA	NA	NA	NA
		4	-0.3144	0.0239	NA	NA	NA	NA	NA	NA
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8903	< 0.0001	-5.1308	< 0.0001	-5.6061	< 0.0001	-6.4475	< 0.0001
CLTV	80 Uninsured	90 Insured	0.7478	< 0.0001	0.8107	< 0.0001	0.5059	< 0.0001	0.6582	< 0.0001
		90 Uninsured	1.3587	< 0.0001	1.0377	< 0.0001	0.8857	< 0.0001	0.8886	0.0006
		95 Insured	0.8057	< 0.0001	1.0532	< 0.0001	0.5654	< 0.0001	0.8356	< 0.0001
		95 Uninsured	1.6262	< 0.0001	1.1023	< 0.0001	0.8492	< 0.0001	0.9102	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.7623	< 0.0001	1.2239	< 0.0001	1.1006	< 0.0001	1.4489	< 0.0001
		720 - 749	0.6251	< 0.0001	0.8820	< 0.0001	0.6850	< 0.0001	0.9827	< 0.0001
		750 - 779	0.3860	< 0.0001	0.3364	0.0011	0.0336	0.7066	0.3597	0.0040
proptyp	SFR	2-4U	0.3509	0.1764	1.0953	< 0.0001	0.5793	< 0.0001	0.9748	< 0.0001
		COND	0.3776	< 0.0001	0.0601	0.4359	-0.3772	< 0.0001	-0.4217	< 0.0001
product	Fixed	ARM	-1.5045	< 0.0001	-1.0521	< 0.0001	-0.4501	< 0.0001	-0.4616	0.0001
source	Non-Retail	CORRESPOND	0.9098	< 0.0001	0.6239	< 0.0001	0.8982	< 0.0001	0.5114	< 0.0001
		OTHER	-1.2857	< 0.0001	-1.3833	< 0.0001	-0.9866	< 0.0001	-0.4102	0.0041
		RETAIL	0.3380	< 0.0001	0.0118	0.8528	0.0443	0.3983	0.2320	< 0.0001
loanpurp	Purchase	C/O REFI	NA	NA	0.5175	< 0.0001	0.3966	< 0.0001	0.0264	0.6880
		R/T REFI	NA	NA	0.2168	0.0011	0.2055	< 0.0001	-0.1422	0.0211
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	-1.2017	< 0.0001	-0.8871	< 0.0001	-0.7175	< 0.0001	-0.4768	< 0.0001
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.2656	0.0005	0.5450	< 0.0001	0.7248	< 0.0001	0.6294	< 0.0001
		1	0.0433	0.5217	0.1230	0.0843	0.2516	< 0.0001	0.3061	< 0.0001
		3	-0.1006	0.1453	-0.0970	0.1987	-0.1831	0.0055	-0.0932	0.2407
		4	-0.1352	0.0928	-0.1572	0.0857	-0.1666	0.0252	0.1832	0.0340
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8611	< 0.0001	-5.0526	< 0.0001	-5.3859	< 0.0001	-6.0312	< 0.0001
CLTV	80 Uninsured	90 Insured	0.7466	< 0.0001	0.8126	< 0.0001	0.4810	< 0.0001	0.6585	< 0.0001
		90 Uninsured	1.3369	< 0.0001	1.0032	< 0.0001	0.6587	< 0.0001	0.6428	0.0002
		95 Insured	0.7962	< 0.0001	1.0228	< 0.0001	0.5736	< 0.0001	0.8184	< 0.0001
		95 Uninsured	1.6195	< 0.0001	1.0565	< 0.0001	0.7908	< 0.0001	0.8514	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.7548	< 0.0001	1.2431	< 0.0001	1.0765	< 0.0001	1.3190	< 0.0001
		720 - 749	0.6242	< 0.0001	0.8947	< 0.0001	0.6236	< 0.0001	0.8331	< 0.0001
		750 - 779	0.3857	< 0.0001	0.3282	0.0012	0.0066	0.9359	0.2677	0.0096
proptyp	SFR	2-4U	0.3847	0.1302	1.1266	< 0.0001	0.5684	< 0.0001	0.9824	< 0.0001
		CONDO	0.3749	< 0.0001	0.0566	0.4522	-0.3050	0.0004	-0.4099	< 0.0001
product	Fixed	ARM	-1.4527	< 0.0001	-0.9349	< 0.0001	-0.3958	< 0.0001	-0.4282	< 0.0001
source	Non-Retail	CORRESPOND	0.9022	< 0.0001	0.5971	< 0.0001	0.6282	< 0.0001	0.5960	< 0.0001
		OTHER	-1.1031	< 0.0001	-1.4461	< 0.0001	-0.7814	< 0.0001	-0.2131	0.0618
		RETAIL	0.3231	< 0.0001	0.0173	0.7786	0.0065	0.8940	0.2436	< 0.0001
loanpurp	Purchase	C/O REFI	NA	NA	0.4775	< 0.0001	0.3833	< 0.0001	0.0134	0.8155
		R/T REFI	NA	NA	0.2034	0.0016	0.1909	0.0001	-0.1497	0.0054
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	-1.1982	< 0.0001	-0.7572	< 0.0001	-0.6324	< 0.0001	-0.4132	< 0.0001
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.2464	0.0011	0.5250	< 0.0001	0.6391	< 0.0001	0.6067	< 0.0001
		1	0.0396	0.5558	0.1044	0.1328	0.2448	< 0.0001	0.2478	< 0.0001
		3	-0.0878	0.1989	-0.1247	0.0903	-0.2068	0.0008	-0.0923	0.1768
		4	-0.1238	0.1192	-0.1531	0.0832	-0.1227	0.0710	0.1369	0.0695
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.4084	< 0.0001	-2.4814	< 0.0001	-0.9102	< 0.0001	-0.7820	< 0.0001
CLTV	80 Uninsured	90 Insured	NA	NA	-0.0006	0.9976	NA	NA	NA	NA
		90 Uninsured	NA	NA	-0.5893	0.0880	NA	NA	NA	NA
		95 Insured	NA	NA	-0.6290	0.0338	NA	NA	NA	NA
		95 Uninsured	NA	NA	1.0310	0.0168	NA	NA	NA	NA
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	NA	NA	0.5037	0.1327	-0.2140	0.2087	NA	NA
		720 - 749	NA	NA	0.1171	0.7390	-0.4544	0.0123	NA	NA
		750 - 779	NA	NA	-0.2152	0.5875	-0.1898	0.3350	NA	NA
proptyp	SFR	2-4U	NA	NA	NA	NA	NA	NA	NA	NA
		CONDO	NA	NA	NA	NA	NA	NA	NA	NA
product	Fixed	ARM	0.9897	0.0048	0.7196	0.0140	NA	NA	NA	NA
source	Non-Retail	CORRESPOND	-0.1379	0.5659	NA	NA	-0.4359	0.0004	0.4725	0.0005
		OTHER	2.0837	0.0007	NA	NA	0.7504	0.0016	0.6614	0.0035
		RETAIL	0.5033	0.0871	NA	NA	0.1953	0.1064	0.0506	0.8463
loanpurp	Purchase	C/O REFI	NA	NA	NA	NA	NA	NA	NA	NA
		R/T REFI	NA	NA	NA	NA	NA	NA	NA	NA
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	NA	NA	0.8947	0.0007	0.3726	0.0105	NA	NA
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	0.9133	0.0039	NA	NA	-0.4636	0.0015	NA	NA
		1	0.2123	0.5252	NA	NA	-0.0784	0.5706	NA	NA
		3	0.5441	0.0900	NA	NA	-0.2563	0.0974	NA	NA
		4	0.0758	0.8496	NA	NA	0.0011	0.9944	NA	NA
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.9581	< 0.0001	-4.2087	< 0.0001	-5.2029	< 0.0001	-5.9618	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5217	< 0.0001	0.4557	< 0.0001	0.5423	< 0.0001	0.7750	< 0.0001
		90 Uninsured	0.7656	< 0.0001	0.8145	< 0.0001	0.8938	< 0.0001	1.0854	< 0.0001
		95 Insured	0.8072	< 0.0001	0.6827	< 0.0001	0.7599	< 0.0001	0.9465	< 0.0001
		95 Uninsured	1.1474	< 0.0001	1.0046	< 0.0001	1.1214	< 0.0001	1.3414	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	2.3619	< 0.0001	3.2588	< 0.0001	3.5849	< 0.0001	3.5314	< 0.0001
		580 - 599	1.8752	< 0.0001	2.5811	< 0.0001	2.9230	< 0.0001	3.0011	< 0.0001
		600 - 619	1.5444	< 0.0001	2.2239	< 0.0001	2.6000	< 0.0001	2.6597	< 0.0001
		620 - 659	1.3538	< 0.0001	1.7597	< 0.0001	2.0957	< 0.0001	2.1652	< 0.0001
		660 - 689	1.1170	< 0.0001	1.5039	< 0.0001	1.6991	< 0.0001	1.6775	< 0.0001
		690 - 719	0.8545	< 0.0001	1.1735	< 0.0001	1.2577	< 0.0001	1.1920	< 0.0001
		720 - 749	0.6260	< 0.0001	0.7947	< 0.0001	0.8523	< 0.0001	0.6886	< 0.0001
		750 - 779	0.3385	< 0.0001	0.3557	< 0.0001	0.3244	< 0.0001	0.1738	0.0587
proptyp	SFR	2-4U	0.0979	0.0020	0.3936	< 0.0001	0.2744	< 0.0001	0.5264	< 0.0001
		COND	0.1509	< 0.0001	-0.0635	< 0.0001	-0.2475	< 0.0001	-0.3401	< 0.0001
product	Fixed	ARM	-0.1257	< 0.0001	-0.2059	< 0.0001	-0.2677	< 0.0001	-0.3709	< 0.0001
source	Non-Retail	CORRESPOND	0.2031	< 0.0001	0.0612	< 0.0001	-0.0420	0.0391	-0.1678	< 0.0001
		OTHER	-1.7214	< 0.0001	-1.7386	< 0.0001	-1.3894	< 0.0001	-0.2847	0.0005
		RETAIL	0.1187	< 0.0001	0.2236	< 0.0001	0.3791	< 0.0001	0.4471	< 0.0001
loanpurp	Purchase	C/O REFI	0.1117	< 0.0001	0.2371	< 0.0001	0.2157	< 0.0001	0.1284	0.0005
		R/T REFI	0.2274	< 0.0001	0.2622	< 0.0001	0.1600	< 0.0001	-0.0835	0.0059
Doctype	Full	Low	0.4750	< 0.0001	0.5852	< 0.0001	0.7380	< 0.0001	0.8851	< 0.0001
intonly	No	YES	1.3451	< 0.0001	1.2899	< 0.0001	1.1519	< 0.0001	0.9367	< 0.0001
negam	No	YES	0.9742	< 0.0001	0.9331	< 0.0001	0.8282	< 0.0001	0.3691	< 0.0001
Term	360	< 360	-0.3485	< 0.0001	-0.4438	< 0.0001	-0.4851	< 0.0001	-0.3583	< 0.0001
		> 360	0.2711	< 0.0001	0.2540	< 0.0001	0.0711	0.0353	0.2587	< 0.0001
Quintile_String	2	0	-0.1702	< 0.0001	NA	NA	0.1731	< 0.0001	0.2548	< 0.0001
		1	-0.0534	0.0002	NA	NA	0.0766	0.0011	0.1888	< 0.0001
		3	-0.0272	0.0537	NA	NA	0.0312	0.1991	-0.0144	0.7322
		4	-0.0463	0.0014	NA	NA	0.1920	< 0.0001	0.2471	< 0.0001
owndcc	O	I	0.3217	< 0.0001	0.5045	< 0.0001	0.7437	< 0.0001	0.3229	< 0.0001
		S	0.0825	< 0.0001	0.1446	< 0.0001	0.5301	< 0.0001	0.0793	0.2758
		U	-0.6595	< 0.0001	-0.0730	0.2111	0.1278	0.0130	0.1721	0.0279

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8988	< 0.0001	-4.1020	< 0.0001	-5.0006	< 0.0001	-5.5875	< 0.0001
CLTV	80 Uninsured	90 Insured	0.5441	< 0.0001	0.4741	< 0.0001	0.5475	< 0.0001	0.7543	< 0.0001
		90 Uninsured	0.8047	< 0.0001	0.8375	< 0.0001	0.9499	< 0.0001	1.1690	< 0.0001
		95 Insured	0.8317	< 0.0001	0.7362	< 0.0001	0.7541	< 0.0001	0.9267	< 0.0001
		95 Uninsured	1.1350	< 0.0001	1.0454	< 0.0001	1.1782	< 0.0001	1.4190	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	2.6182	< 0.0001	3.5409	< 0.0001	3.7441	< 0.0001	3.6395	< 0.0001
		580 - 599	2.0471	< 0.0001	2.7368	< 0.0001	3.0406	< 0.0001	3.0307	< 0.0001
		600 - 619	1.6562	< 0.0001	2.3555	< 0.0001	2.6998	< 0.0001	2.7661	< 0.0001
		620 - 659	1.4120	< 0.0001	1.8287	< 0.0001	2.1471	< 0.0001	2.1770	< 0.0001
		660 - 689	1.1514	< 0.0001	1.5192	< 0.0001	1.7194	< 0.0001	1.6381	< 0.0001
		690 - 719	0.8828	< 0.0001	1.1747	< 0.0001	1.2543	< 0.0001	1.1471	< 0.0001
		720 - 749	0.6407	< 0.0001	0.7851	< 0.0001	0.8337	< 0.0001	0.6352	< 0.0001
		750 - 779	0.3458	< 0.0001	0.3361	< 0.0001	0.2942	< 0.0001	0.1511	0.0491
proptyp	SFR	2-4U	0.1174	0.0002	0.4017	< 0.0001	0.2982	< 0.0001	0.4401	< 0.0001
		CONDO	0.1202	< 0.0001	-0.0943	< 0.0001	-0.2547	< 0.0001	-0.3316	< 0.0001
product	Fixed	ARM	-0.1203	< 0.0001	-0.1942	< 0.0001	-0.2742	< 0.0001	-0.3732	< 0.0001
source	Non-Retail	CORRESPOND	0.2221	< 0.0001	0.0762	< 0.0001	-0.0202	0.2847	-0.0522	0.1170
		OTHER	-1.6267	< 0.0001	-1.7153	< 0.0001	-1.2524	< 0.0001	-0.1758	0.0106
		RETAIL	0.1044	< 0.0001	0.2193	< 0.0001	0.3501	< 0.0001	0.4035	< 0.0001
loanpurp	Purchase	C/O REFI	0.1377	< 0.0001	0.2744	< 0.0001	0.2217	< 0.0001	0.1411	< 0.0001
		R/T REFI	0.2772	< 0.0001	0.2973	< 0.0001	0.1589	< 0.0001	-0.0872	0.0008
Doctype	Full	Low	0.4885	< 0.0001	0.5978	< 0.0001	0.7281	< 0.0001	0.8342	< 0.0001
intonly	No	YES	1.3759	< 0.0001	1.2568	< 0.0001	1.0770	< 0.0001	0.7798	< 0.0001
negam	No	YES	0.9349	< 0.0001	0.8636	< 0.0001	0.7823	< 0.0001	0.3667	< 0.0001
Term	360	< 360	-0.1582	0.0009	-0.2369	< 0.0001	-0.3563	< 0.0001	-0.2581	< 0.0001
		> 360	0.3425	< 0.0001	0.3567	< 0.0001	0.1737	< 0.0001	0.4143	< 0.0001
Quintile_String	2	0	-0.1821	< 0.0001	NA	NA	0.1688	< 0.0001	0.2598	< 0.0001
		1	-0.0557	< 0.0001	NA	NA	0.0760	0.0004	0.1787	< 0.0001
		3	-0.0254	0.0685	NA	NA	0.0286	0.2001	-0.0312	0.3827
		4	-0.0604	< 0.0001	NA	NA	0.1614	< 0.0001	0.1654	< 0.0001
owndcc	O	I	0.2939	< 0.0001	0.4706	< 0.0001	0.6840	< 0.0001	0.2994	< 0.0001
		S	0.0505	0.0029	0.1262	< 0.0001	0.4656	< 0.0001	0.1104	0.0734
		U	-0.5587	< 0.0001	0.0145	0.7871	0.1510	0.0012	0.2205	0.0008

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.3530	< 0.0001	-1.6180	< 0.0001	-1.0265	< 0.0001	-0.2065	0.1552
CLTV	80 Uninsured	90 Insured	0.1869	< 0.0001	0.1527	0.0001	0.0821	0.0438	0.0217	0.7018
		90 Uninsured	0.0556	0.0231	0.0954	0.0013	0.3025	< 0.0001	0.5094	< 0.0001
		95 Insured	0.2549	< 0.0001	0.2987	< 0.0001	0.0934	0.0506	0.0456	0.4933
		95 Uninsured	0.1499	0.0004	0.1781	< 0.0001	0.2525	< 0.0001	0.4293	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	1.6865	< 0.0001	1.4475	< 0.0001	1.0135	< 0.0001	0.4895	0.0011
		580 - 599	1.2922	< 0.0001	1.3693	< 0.0001	0.9061	< 0.0001	0.3947	0.0190
		600 - 619	1.2031	< 0.0001	1.0905	< 0.0001	0.7736	< 0.0001	0.3296	0.0354
		620 - 659	0.7086	< 0.0001	0.6998	< 0.0001	0.4644	< 0.0001	0.0268	0.8477
		660 - 689	0.4587	< 0.0001	0.3879	< 0.0001	0.2698	0.0035	-0.1985	0.1559
		690 - 719	0.2877	< 0.0001	0.1402	0.0658	0.0874	0.3493	-0.2987	0.0348
		720 - 749	0.1207	0.0574	0.0203	0.7971	-0.1080	0.2654	-0.3900	0.0081
		750 - 779	0.0310	0.6444	-0.1197	0.1598	-0.1799	0.0869	-0.3207	0.0421
proptyp	SFR	2-4U	0.1235	0.0826	-0.1180	0.0246	NA	NA	-0.2602	0.0110
		COND	-0.2893	< 0.0001	-0.2233	< 0.0001	NA	NA	0.0301	0.7242
product	Fixed	ARM	-0.1269	< 0.0001	NA	NA	-0.1081	0.0028	NA	NA
source	Non-Retail	CORRESPOND	-0.0199	0.4344	NA	NA	0.0590	0.1097	0.4579	< 0.0001
		OTHER	1.3295	< 0.0001	NA	NA	0.5957	< 0.0001	0.8736	< 0.0001
		RETAIL	0.0593	0.0234	NA	NA	0.0368	0.2721	0.1518	0.0022
loanpurp	Purchase	C/O REFI	0.2601	< 0.0001	0.1424	< 0.0001	0.0296	0.4638	0.0883	0.1536
		R/T REFI	0.2626	< 0.0001	0.0963	0.0013	-0.0797	0.0167	-0.1220	0.0158
Doctype	Full	Low	0.0707	0.0041	0.0649	0.0114	NA	NA	NA	NA
intonly	No	YES	0.2781	< 0.0001	-0.2190	< 0.0001	-0.2451	< 0.0001	-0.6458	< 0.0001
negam	No	YES	-0.1421	< 0.0001	-0.4354	< 0.0001	-0.2493	< 0.0001	NA	NA
Term	360	< 360	1.4790	< 0.0001	0.9510	< 0.0001	0.7011	< 0.0001	0.5468	< 0.0001
		> 360	0.2774	< 0.0001	0.3832	< 0.0001	0.6180	< 0.0001	0.8972	< 0.0001
Quintile_String	2	0	NA	NA	-0.0801	0.0384	NA	NA	-0.0543	0.3993
		1	NA	NA	-0.0334	0.3399	NA	NA	-0.1226	0.0600
		3	NA	NA	0.0278	0.4372	NA	NA	-0.1244	0.0809
		4	NA	NA	-0.0299	0.4386	NA	NA	-0.3117	< 0.0001
owndcc	O	I	-0.3670	< 0.0001	-0.3366	< 0.0001	-0.4322	< 0.0001	-0.2364	0.0029
		S	-0.3227	< 0.0001	-0.1375	0.0403	-0.3238	< 0.0001	0.1035	0.4132
		U	0.8369	< 0.0001	0.5995	< 0.0001	0.1492	0.0882	0.0131	0.9181

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.9819	< 0.0001	-4.5359	< 0.0001	-5.3167	< 0.0001	-5.6732	< 0.0001
CLTV	80 Uninsured	90 Insured	0.3877	< 0.0001	0.3337	< 0.0001	0.5044	< 0.0001	0.7462	< 0.0001
		90 Uninsured	1.1902	< 0.0001	1.0610	< 0.0001	0.9803	< 0.0001	1.1731	< 0.0001
		95 Insured	0.7478	< 0.0001	0.6508	< 0.0001	0.7092	< 0.0001	0.8732	< 0.0001
		95 Uninsured	1.4859	< 0.0001	1.0819	< 0.0001	1.1299	< 0.0001	1.3680	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	2.3784	< 0.0001	3.4550	< 0.0001	3.8938	< 0.0001	3.4943	< 0.0001
		580 - 599	1.9017	< 0.0001	2.6410	< 0.0001	2.8402	< 0.0001	2.6553	< 0.0001
		600 - 619	1.4386	< 0.0001	2.3093	< 0.0001	2.4981	< 0.0001	2.2423	< 0.0001
		620 - 659	1.2479	< 0.0001	1.8294	< 0.0001	2.0922	< 0.0001	1.9290	< 0.0001
		660 - 689	1.0372	< 0.0001	1.5503	< 0.0001	1.6755	< 0.0001	1.4912	< 0.0001
		690 - 719	0.8075	< 0.0001	1.2357	< 0.0001	1.2809	< 0.0001	1.0159	< 0.0001
		720 - 749	0.5817	< 0.0001	0.8026	< 0.0001	0.8459	< 0.0001	0.5762	< 0.0001
		750 - 779	0.3369	< 0.0001	0.3326	< 0.0001	0.3412	< 0.0001	0.0999	0.3628
proptyp	SFR	2-4U	0.0617	0.1643	0.3312	< 0.0001	0.1780	0.0002	0.4478	< 0.0001
		COND	0.1549	< 0.0001	-0.0511	0.0402	-0.3155	< 0.0001	-0.3233	< 0.0001
product	Fixed	ARM	-0.4873	< 0.0001	-0.4998	< 0.0001	-0.5168	< 0.0001	-0.6817	< 0.0001
source	Non-Retail	CORRESPOND	0.4006	< 0.0001	0.1195	< 0.0001	0.1964	< 0.0001	0.3616	< 0.0001
		OTHER	-1.7423	< 0.0001	-1.5623	< 0.0001	-1.4714	< 0.0001	-0.7738	< 0.0001
		RETAIL	0.1041	< 0.0001	0.3207	< 0.0001	0.4468	< 0.0001	0.5506	< 0.0001
loanpurp	Purchase	C/O REFI	0.1030	< 0.0001	0.1646	< 0.0001	0.1128	0.0002	NA	NA
		R/T REFI	0.4520	< 0.0001	0.3940	< 0.0001	0.2507	< 0.0001	NA	NA
Doctype	Full	Low	0.2937	< 0.0001	0.4387	< 0.0001	0.8482	< 0.0001	0.9991	< 0.0001
intonly	No	YES	2.0548	< 0.0001	1.8818	< 0.0001	1.2383	< 0.0001	0.7507	< 0.0001
negam	No	YES	0.9516	< 0.0001	0.9359	< 0.0001	0.5870	< 0.0001	NA	NA
Term	360	< 360	-0.6710	< 0.0001	-0.7853	< 0.0001	-0.5939	< 0.0001	-0.4070	< 0.0001
		> 360	1.0451	< 0.0001	1.1504	< 0.0001	0.7151	< 0.0001	-0.5482	0.0933
Quintile_String	2	0	-0.1927	< 0.0001	0.1360	< 0.0001	0.3330	< 0.0001	0.3108	< 0.0001
		1	-0.0511	0.0121	0.0978	0.0002	0.1435	< 0.0001	0.2202	< 0.0001
		3	-0.0570	0.0050	0.0164	0.5380	0.0222	0.5109	-0.0020	0.9695
		4	-0.0970	< 0.0001	0.0483	0.0873	0.1816	< 0.0001	0.1672	0.0012
owndcc	O	I	0.6130	< 0.0001	0.9303	< 0.0001	1.1217	< 0.0001	0.3344	< 0.0001
		S	0.4145	< 0.0001	0.4459	< 0.0001	0.6437	< 0.0001	-0.0006	0.9948
		U	-1.8304	< 0.0001	-1.3404	< 0.0001	-0.7455	< 0.0001	-0.4241	0.0004

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.9584	< 0.0001	-4.4522	< 0.0001	-5.1114	< 0.0001	-5.3330	< 0.0001
CLTV	80 Uninsured	90 Insured	0.3965	< 0.0001	0.3273	< 0.0001	0.4831	< 0.0001	0.7155	< 0.0001
		90 Uninsured	1.1857	< 0.0001	1.0496	< 0.0001	0.9785	< 0.0001	1.2998	< 0.0001
		95 Insured	0.7489	< 0.0001	0.6368	< 0.0001	0.6811	< 0.0001	0.8506	< 0.0001
		95 Uninsured	1.4850	< 0.0001	1.0543	< 0.0001	1.0934	< 0.0001	1.4164	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	2.4497	< 0.0001	3.4667	< 0.0001	3.8686	< 0.0001	3.4823	< 0.0001
		580 - 599	1.9719	< 0.0001	2.7637	< 0.0001	2.8356	< 0.0001	2.5922	< 0.0001
		600 - 619	1.4718	< 0.0001	2.3138	< 0.0001	2.4740	< 0.0001	2.2376	< 0.0001
		620 - 659	1.2607	< 0.0001	1.8336	< 0.0001	2.0646	< 0.0001	1.8987	< 0.0001
		660 - 689	1.0412	< 0.0001	1.5322	< 0.0001	1.6284	< 0.0001	1.4217	< 0.0001
		690 - 719	0.8097	< 0.0001	1.2110	< 0.0001	1.2343	< 0.0001	0.9633	< 0.0001
		720 - 749	0.5800	< 0.0001	0.7838	< 0.0001	0.8038	< 0.0001	0.5180	< 0.0001
		750 - 779	0.3343	< 0.0001	0.3088	< 0.0001	0.2742	< 0.0001	0.0999	0.2905
proptyp	SFR	2-4U	0.0728	0.0994	0.3331	< 0.0001	0.2112	< 0.0001	0.3927	< 0.0001
		CONDO	0.1585	< 0.0001	-0.0423	0.0843	-0.3007	< 0.0001	-0.2984	< 0.0001
product	Fixed	ARM	-0.4838	< 0.0001	-0.4982	< 0.0001	-0.4958	< 0.0001	-0.6484	< 0.0001
source	Non-Retail	CORRESPOND	0.3933	< 0.0001	0.1175	< 0.0001	0.1847	< 0.0001	0.3211	< 0.0001
		OTHER	-1.6337	< 0.0001	-1.4798	< 0.0001	-1.2617	< 0.0001	-0.6127	< 0.0001
		RETAIL	0.1081	< 0.0001	0.3185	< 0.0001	0.4359	< 0.0001	0.5276	< 0.0001
loanpurp	Purchase	C/O REFI	0.1049	< 0.0001	0.1524	< 0.0001	0.1110	0.0001	0.0954	0.0151
		R/T REFI	0.4516	< 0.0001	0.3839	< 0.0001	0.2310	< 0.0001	-0.0411	0.2513
Doctype	Full	Low	0.3029	< 0.0001	0.4459	< 0.0001	0.8124	< 0.0001	0.8849	< 0.0001
intonly	No	YES	2.0411	< 0.0001	1.8472	< 0.0001	1.1636	< 0.0001	0.6450	< 0.0001
negam	No	YES	0.9288	< 0.0001	0.9010	< 0.0001	0.5378	< 0.0001	NA	NA
Term	360	< 360	-0.6635	< 0.0001	-0.7193	< 0.0001	-0.5076	< 0.0001	-0.3021	< 0.0001
		> 360	1.0901	< 0.0001	1.1685	< 0.0001	0.7322	< 0.0001	-0.3163	0.2401
Quintile_String	2	0	-0.1909	< 0.0001	0.1309	< 0.0001	0.3139	< 0.0001	0.2929	< 0.0001
		1	-0.0546	0.0072	0.0696	0.0005	0.1354	< 0.0001	0.2089	< 0.0001
		3	-0.0570	0.0048	0.0158	0.5469	0.0179	0.5737	-0.0099	0.8294
		4	-0.0986	< 0.0001	0.0499	0.0727	0.1699	< 0.0001	0.1437	0.0018
ownocc	O	I	0.6073	< 0.0001	0.9081	< 0.0001	1.0590	< 0.0001	0.3203	< 0.0001
		S	0.4175	< 0.0001	0.4383	< 0.0001	0.6045	< 0.0001	0.0336	0.6783
		U	-1.7789	< 0.0001	-1.2829	< 0.0001	-0.6572	< 0.0001	-0.4253	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 4. All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.2682	< 0.0001	-2.0554	< 0.0001	-1.1636	< 0.0001	-0.3850	0.0240
CLTV	80 Uninsured	90 Insured	0.1993	0.0236	NA	NA	-0.0772	0.2294	-0.0746	0.2805
		90 Uninsured	0.1220	0.0221	NA	NA	0.1699	0.0265	0.6405	< 0.0001
		95 Insured	0.2307	0.0654	NA	NA	-0.0898	0.2359	-0.0965	0.2379
		95 Uninsured	0.1193	0.1665	NA	NA	0.0281	0.7602	0.2318	0.1320
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	2.0003	< 0.0001	1.3383	< 0.0001	0.6073	0.0002	0.1062	0.5970
		580 - 599	1.8497	< 0.0001	1.3691	< 0.0001	0.5828	0.0031	-0.0368	0.8775
		600 - 619	1.4523	< 0.0001	0.9311	< 0.0001	0.3935	0.0256	-0.0271	0.8988
		620 - 659	0.8933	< 0.0001	0.4754	0.0013	0.1528	0.2738	-0.1436	0.4100
		660 - 689	0.5952	< 0.0001	0.1681	0.2490	0.0009	0.9950	-0.3078	0.0781
		690 - 719	0.3179	0.0210	-0.1574	0.2899	-0.1214	0.3849	-0.4065	0.0223
		720 - 749	0.0079	0.9563	-0.1442	0.3499	-0.1405	0.3315	-0.4335	0.0192
		750 - 779	-0.0559	0.7147	-0.3319	0.0505	-0.3339	0.0370	-0.3014	0.1269
proptyp	SFR	2-4U	NA	NA	NA	NA	NA	NA	-0.2858	0.0196
		COND	NA	NA	NA	NA	NA	NA	0.1554	0.1531
product	Fixed	ARM	-0.1981	0.0011	NA	NA	NA	NA	NA	NA
source	Non-Retail	CORRESPOND	-0.2640	< 0.0001	-0.0504	0.4588	-0.1418	0.0420	0.0404	0.7230
		OTHER	1.6747	< 0.0001	0.5716	0.0031	0.8046	< 0.0001	0.7816	< 0.0001
		RETAIL	0.1363	0.0179	0.1075	0.0776	0.0461	0.4153	0.0697	0.3007
loanpurp	Purchase	C/O REFI	NA	NA	0.1879	0.0157	0.0489	0.4635	NA	NA
		R/T REFI	NA	NA	-0.2189	0.0019	-0.1740	0.0038	NA	NA
Doctype	Full	Low	0.1460	0.0066	0.1184	0.0344	-0.1047	0.0342	-0.3374	< 0.0001
intonly	No	YES	0.1277	0.0105	-0.5312	< 0.0001	-0.2948	< 0.0001	-0.5301	0.0014
negam	No	YES	NA	NA	-0.5571	< 0.0001	-0.4247	< 0.0001	-0.5074	0.0307
Term	360	< 360	0.9250	0.0001	0.8912	< 0.0001	0.5790	< 0.0001	0.4888	< 0.0001
		> 360	0.1683	0.0362	0.3203	0.0218	1.0118	< 0.0001	1.2663	0.0236
Quintile_String	2	0	NA	NA	NA	NA	NA	NA	NA	NA
		1	NA	NA	NA	NA	NA	NA	NA	NA
		3	NA	NA	NA	NA	NA	NA	NA	NA
		4	NA	NA	NA	NA	NA	NA	NA	NA
owncc	O	I	-0.3124	< 0.0001	-0.3304	< 0.0001	-0.6238	< 0.0001	NA	NA
		S	-0.2572	0.0035	-0.0968	0.4425	-0.3041	0.0105	NA	NA
		U	0.9644	0.0527	0.4124	0.1992	0.2274	0.2247	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.0014	< 0.0001	-4.7316	< 0.0001	-5.1074	< 0.0001	-5.7219	< 0.0001
CLTV	80 Uninsured	80 Insured	0.7868	< 0.0001	0.6201	< 0.0001	0.4482	< 0.0001	0.9981	< 0.0001
		90 Uninsured	0.9680	< 0.0001	1.0162	< 0.0001	0.7190	< 0.0001	0.2660	0.1457
		95 Insured	0.9829	< 0.0001	0.8860	< 0.0001	0.5404	< 0.0001	0.9457	< 0.0001
		95 Uninsured	1.3422	< 0.0001	1.2579	< 0.0001	0.9035	< 0.0001	0.7648	0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.9066	< 0.0001	1.2809	< 0.0001	1.0269	< 0.0001	1.3268	< 0.0001
		720 - 749	0.6865	< 0.0001	0.8272	< 0.0001	0.6699	< 0.0001	0.8127	< 0.0001
		750 - 779	0.3938	0.0002	0.2783	0.0249	0.0021	0.9867	0.3184	0.0707
proptyp	SFR	2-4U	0.2865	0.3112	0.9177	< 0.0001	0.3855	0.0381	0.7273	< 0.0001
		CONDO	0.3538	< 0.0001	-0.0478	0.6054	-0.4027	0.0031	-0.4597	0.0028
product	Fixed	ARM	-1.2745	< 0.0001	-1.0751	< 0.0001	-0.4959	< 0.0001	-0.6774	< 0.0001
source	Non-Retail	CORRESPOND	0.4190	< 0.0001	0.5168	< 0.0001	0.4084	< 0.0001	-0.2835	0.0508
		OTHER	-1.7793	< 0.0001	-1.3993	< 0.0001	-1.2210	< 0.0001	-0.4425	0.0958
		RETAIL	0.1554	0.0163	0.1983	0.0037	0.3074	< 0.0001	0.7901	< 0.0001
loanpurp	Purchase	C/O REFI	0.0011	0.9877	0.2415	0.0021	0.1729	0.0304	0.1411	0.1602
		R/T REFI	0.2538	0.0010	0.5210	< 0.0001	0.1410	0.0594	-0.2075	0.0278
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	-0.6034	< 0.0001	-0.4897	< 0.0001	-0.3940	< 0.0001	-0.2736	0.0174
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.2739	0.0042	0.2491	0.0065	0.4629	< 0.0001	0.3641	0.0006
		1	-0.0454	0.6035	0.0724	0.4159	0.2061	0.0208	0.1039	0.3296
		3	-0.1182	0.1822	-0.1280	0.1703	-0.1153	0.2249	-0.1875	0.1022
		4	-0.1384	0.1019	-0.1349	0.1505	-0.0725	0.4422	-0.0762	0.5050
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.8857	< 0.0001	-4.5854	< 0.0001	-4.9491	< 0.0001	-5.3560	< 0.0001
CLTV	80 Uninsured	80 Insured	0.7649	< 0.0001	0.5978	< 0.0001	0.4607	< 0.0001	0.9463	< 0.0001
		90 Uninsured	1.0015	< 0.0001	1.0508	< 0.0001	0.7889	< 0.0001	0.3895	0.0056
		95 Insured	0.9406	< 0.0001	0.8440	< 0.0001	0.5733	< 0.0001	0.8734	< 0.0001
		95 Uninsured	1.3381	< 0.0001	1.2945	< 0.0001	0.9755	< 0.0001	0.8841	< 0.0001
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.8924	< 0.0001	1.2264	< 0.0001	1.0844	< 0.0001	1.2445	< 0.0001
		720 - 749	0.6678	< 0.0001	0.7653	< 0.0001	0.6529	< 0.0001	0.7178	< 0.0001
		750 - 779	0.3841	0.0001	0.2261	0.0455	-0.0230	0.8376	0.1626	0.2563
proptyp	SFR	2-4U	0.2383	0.3873	0.8946	< 0.0001	0.4059	0.0148	0.6970	< 0.0001
		COND	0.3380	< 0.0001	-0.0854	0.3243	-0.3353	0.0052	-0.4089	0.0014
product	Fixed	ARM	-1.1760	< 0.0001	-0.8644	< 0.0001	-0.4910	< 0.0001	-0.6542	< 0.0001
source	Non-Retail	CORRESPOND	0.4475	< 0.0001	0.5738	< 0.0001	0.4560	< 0.0001	-0.1483	0.1899
		OTHER	-1.3027	< 0.0001	-1.5300	< 0.0001	-1.1227	< 0.0001	-0.2706	0.1812
		RETAIL	0.1416	0.0221	0.1201	0.0574	0.3200	< 0.0001	0.6907	< 0.0001
loanpurp	Purchase	C/O REFI	0.0322	0.6468	0.2598	0.0004	0.1533	0.0328	0.0502	0.5349
		R/T REFI	0.3450	< 0.0001	0.5220	< 0.0001	0.1601	0.0161	-0.2395	0.0024
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
term	360	< 360	-0.5504	< 0.0001	-0.2832	0.0037	-0.2810	0.0002	NA	NA
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.2989	0.0011	0.2501	0.0033	0.4383	< 0.0001	0.3885	< 0.0001
		1	-0.0938	0.2616	0.0950	0.2492	0.2005	0.0125	0.0812	0.3721
		3	-0.1201	0.1515	-0.1570	0.0720	-0.1066	0.2122	-0.1555	0.1071
		4	-0.1716	0.0330	-0.1156	0.1820	-0.0062	0.9413	-0.1031	0.2902
ownocc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-2.2186	< 0.0001	-1.4546	< 0.0001	-1.0385	< 0.0001	-0.3751	0.1511
CLTV	80 Uninsured	90 Insured	NA	NA	NA	NA	NA	NA	-0.1083	0.4725
		90 Uninsured	NA	NA	NA	NA	NA	NA	0.6982	0.0023
		95 Insured	NA	NA	NA	NA	NA	NA	-0.1238	0.4798
		95 Uninsured	NA	NA	NA	NA	NA	NA	0.4279	0.1652
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	NA	NA	NA	NA	NA	NA	-0.3270	0.2083
		720 - 749	NA	NA	NA	NA	NA	NA	-0.3209	0.2382
		750 - 779	NA	NA	NA	NA	NA	NA	-0.7525	0.0126
proptyp	SFR	2-4U	NA	NA	NA	NA	NA	NA	NA	NA
		COND	NA	NA	NA	NA	NA	NA	NA	NA
product	Fixed	ARM	0.5811	0.0087	0.5262	0.0121	NA	NA	NA	NA
source	Non-Retail	CORRESPOND	-0.0354	0.8560	NA	NA	0.4301	0.0043	0.5745	0.0123
		OTHER	1.8134	0.0011	NA	NA	0.0139	0.9622	0.6715	0.1043
		RETAIL	0.0002	0.9988	NA	NA	0.1239	0.3521	0.3193	0.0315
loanpurp	Purchase	C/O REFI	0.4058	0.0255	NA	NA	NA	NA	NA	NA
		R/T REFI	0.8588	< 0.0001	NA	NA	NA	NA	NA	NA
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	NA	NA	0.8514	< 0.0001	0.6858	< 0.0001	0.6390	0.0004
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	NA	NA	NA	NA	NA	NA	NA	NA
		1	NA	NA	NA	NA	NA	NA	NA	NA
		3	NA	NA	NA	NA	NA	NA	NA	NA
		4	NA	NA	NA	NA	NA	NA	NA	NA
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Default_NC

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.1244	< 0.0001	-5.0848	< 0.0001	-4.9145	< 0.0001	-5.5782	< 0.0001
CLTV	80 Uninsured	90 Insured	0.8337	< 0.0001	0.3856	0.0029	0.3542	0.0002	0.9921	< 0.0001
		90 Uninsured	1.7666	< 0.0001	1.2422	< 0.0001	0.9560	< 0.0001	0.0939	0.8757
		95 Insured	0.9864	< 0.0001	0.8960	< 0.0001	0.4868	< 0.0001	0.9680	< 0.0001
		95 Uninsured	2.3174	< 0.0001	1.5426	< 0.0001	1.0991	< 0.0001	0.4851	0.4162
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.8301	< 0.0001	1.2508	< 0.0001	0.8032	< 0.0001	1.2204	< 0.0001
		720 - 749	0.6812	< 0.0001	0.7632	< 0.0001	0.5128	< 0.0001	0.7463	< 0.0001
		750 - 779	0.4204	0.0096	0.1908	0.3076	-0.1645	0.2617	0.3036	0.1266
proptyp	SFR	2-4U	NA	NA	1.2723	< 0.0001	0.4116	0.0568	0.7541	< 0.0001
		CONDO	NA	NA	-0.1436	0.3185	-0.6295	0.0003	-0.4494	0.0070
product	Fixed	ARM	-1.5668	< 0.0001	-1.2180	< 0.0001	-0.5597	< 0.0001	-0.7363	< 0.0001
source	Non-Retail	CORRESPOND	1.0295	< 0.0001	0.8029	< 0.0001	0.8075	< 0.0001	0.5280	0.0147
		OTHER	-2.5188	< 0.0001	-1.2761	< 0.0001	-1.2632	< 0.0001	-0.4294	0.1080
		RETAIL	0.2903	0.0045	0.3279	0.0020	0.4218	< 0.0001	0.9170	< 0.0001
loanpurp	Purchase	C/O REFI	NA	NA	0.3922	0.0008	0.2847	0.0036	0.1527	0.1725
		R/T REFI	NA	NA	0.1940	0.1189	0.0832	0.3900	-0.2936	0.0070
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
term	360	< 360	-1.1765	< 0.0001	-0.8935	< 0.0001	-0.3860	0.0012	-0.4119	0.0050
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	-0.2924	0.0484	0.6077	< 0.0001	0.5679	< 0.0001	0.3232	0.0057
		1	0.0182	0.8944	0.2386	0.0876	0.0917	0.4002	0.0617	0.5969
		3	-0.0954	0.4886	-0.1691	0.2699	-0.1311	0.2425	-0.1362	0.2679
		4	0.0932	0.4863	0.1772	0.2283	-0.1382	0.2341	-0.0088	0.9437
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Default_90

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.0808	< 0.0001	-4.9667	< 0.0001	-4.7420	< 0.0001	-5.1533	< 0.0001
CLTV	80 Uninsured	90 Insured	0.7972	< 0.0001	0.3970	0.0016	0.3072	0.0006	0.9398	< 0.0001
		90 Uninsured	1.7289	< 0.0001	1.2400	< 0.0001	0.9255	< 0.0001	0.0693	0.8943
		95 Insured	0.8795	< 0.0001	0.9171	< 0.0001	0.4932	< 0.0001	0.9057	< 0.0001
		95 Uninsured	2.2665	< 0.0001	1.4885	< 0.0001	0.9685	< 0.0001	0.4885	0.3460
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	0.7702	< 0.0001	1.2193	< 0.0001	0.8015	< 0.0001	1.0921	< 0.0001
		720 - 749	0.6452	< 0.0001	0.7497	< 0.0001	0.4512	0.0002	0.6080	< 0.0001
		750 - 779	0.3885	0.0141	0.1489	0.4094	-0.2000	0.1391	0.1467	0.3771
proptyp	SFR	2-4U	NA	NA	1.3238	< 0.0001	0.4572	0.0200	0.7282	< 0.0001
		CONDO	NA	NA	-0.1684	0.2279	-0.5700	0.0003	-0.4560	0.0019
product	Fixed	ARM	-1.4736	< 0.0001	-1.0557	< 0.0001	-0.5166	< 0.0001	-0.7187	< 0.0001
source	Non-Retail	CORRESPOND	1.0478	< 0.0001	0.7713	< 0.0001	0.7107	< 0.0001	0.5347	0.0044
		OTHER	-1.8240	< 0.0001	-1.3432	< 0.0001	-1.1380	< 0.0001	-0.1843	0.3704
		RETAIL	0.3088	0.0022	0.3268	0.0015	0.4549	< 0.0001	0.8944	< 0.0001
loanpurp	Purchase	C/O REFI	NA	NA	0.3558	0.0017	0.3172	0.0005	0.1059	0.2732
		R/T REFI	NA	NA	0.1601	0.1849	0.1108	0.2163	-0.3269	0.0008
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
term	360	< 360	-1.1778	< 0.0001	-0.8520	< 0.0001	-0.3386	0.0019	-0.2599	0.0312
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	NA	NA	0.5982	< 0.0001	0.5092	< 0.0001	0.3042	0.0030
		1	NA	NA	0.1981	0.1418	0.0843	0.4086	0.0305	0.7665
		3	NA	NA	-0.2380	0.1106	-0.0775	0.4532	-0.1372	0.1993
		4	NA	NA	0.1729	0.2198	-0.0703	0.5092	-0.0798	0.4683
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Parameter Estimates and Significance
Loan Population 5 QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Response Variable: Cure

		HPA Bucket	HPA<=-20%		-20%<HPA<=0%		0%<HPA<=20%		20%<HPA	
Variable	Reference Level	Level	Parameter	p-value	Parameter	p-value	Parameter	p-value	Parameter	p-value
		Intercept	-3.3509	< 0.0001	-2.4042	< 0.0001	-1.4639	< 0.0001	-0.8775	< 0.0001
CLTV	80 Uninsured	90 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		90 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
		95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Insured	NA	NA	NA	NA	NA	NA	NA	NA
		GT95 Uninsured	NA	NA	NA	NA	NA	NA	NA	NA
ficobucket	780-850	350 - 579	NA	NA	NA	NA	NA	NA	NA	NA
		580 - 599	NA	NA	NA	NA	NA	NA	NA	NA
		600 - 619	NA	NA	NA	NA	NA	NA	NA	NA
		620 - 659	NA	NA	NA	NA	NA	NA	NA	NA
		660 - 689	NA	NA	NA	NA	NA	NA	NA	NA
		690 - 719	NA	NA	NA	NA	NA	NA	NA	NA
		720 - 749	NA	NA	NA	NA	NA	NA	NA	NA
		750 - 779	NA	NA	NA	NA	NA	NA	NA	NA
proptyp	SFR	2-4U	NA	NA	NA	NA	NA	NA	NA	NA
		COND	NA	NA	NA	NA	NA	NA	NA	NA
product	Fixed	ARM	1.1434	0.0096	0.9804	0.0048	NA	NA	NA	NA
source	Non-Retail	CORRESPOND	-0.1458	0.7894	NA	NA	NA	NA	NA	NA
		OTHER	3.3893	0.0001	NA	NA	NA	NA	NA	NA
		RETAIL	0.4176	0.3682	NA	NA	NA	NA	NA	NA
loanpurp	Purchase	C/O REFI	0.1147	0.8241	NA	NA	NA	NA	NA	NA
		R/T REFI	1.3036	0.0020	NA	NA	NA	NA	NA	NA
Doctype	Full	Low	NA	NA	NA	NA	NA	NA	NA	NA
intonly	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
negam	No	YES	NA	NA	NA	NA	NA	NA	NA	NA
Term	360	< 360	NA	NA	NA	NA	0.4787	0.0444	0.8310	0.0003
		> 360	NA	NA	NA	NA	NA	NA	NA	NA
Quintile_String	2	0	NA	NA	NA	NA	NA	NA	NA	NA
		1	NA	NA	NA	NA	NA	NA	NA	NA
		3	NA	NA	NA	NA	NA	NA	NA	NA
		4	NA	NA	NA	NA	NA	NA	NA	NA
owndcc	O	I	NA	NA	NA	NA	NA	NA	NA	NA
		S	NA	NA	NA	NA	NA	NA	NA	NA
		U	NA	NA	NA	NA	NA	NA	NA	NA

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated and Active Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	80,539	36,246	45.0%	47,743	13,838	29.0%	1.553	1.195	< 0.0001
	-20%<HPA<=0%	90,231	17,320	19.2%	123,527	14,691	11.9%	1.614	1.326	< 0.0001
	0%<HPA<=20%	92,784	7,194	7.8%	308,605	17,487	5.7%	1.368	1.409	< 0.0001
	20%<HPA	60,436	1,818	3.0%	341,716	9,119	2.7%	1.127	1.432	< 0.0001
Default_90	HPA<=-20%	80,539	38,415	47.7%	47,743	15,344	32.1%	1.484	1.193	< 0.0001
	-20%<HPA<=0%	90,231	19,359	21.5%	123,527	17,938	14.5%	1.477	1.316	< 0.0001
	0%<HPA<=20%	92,784	8,883	9.6%	308,605	23,053	7.5%	1.282	1.415	< 0.0001
	20%<HPA	60,436	2,611	4.7%	341,716	14,351	4.2%	1.108	1.455	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	38,415	4,824	12.6%	15,344	2,703	17.6%	0.713	0.953	0.0990
	-20%<HPA<=0%	19,359	4,187	21.6%	17,938	5,548	30.9%	0.699	0.994	0.8215
	0%<HPA<=20%	8,883	3,254	36.6%	23,053	9,208	39.9%	0.917	1.107	0.0003
	20%<HPA	2,611	1,663	63.7%	14,351	7,902	55.1%	1.074	1.228	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated and Active Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	21,854	9,496	43.5%	20,912	6,443	30.8%	1.410	1.250	< 0.0001
	-20%<HPA<=0%	44,092	7,392	16.8%	61,640	7,468	12.1%	1.384	1.364	< 0.0001
	0%<HPA<=20%	63,349	4,491	7.1%	196,782	11,597	5.9%	1.203	1.491	< 0.0001
	20%<HPA	37,426	1,248	3.3%	225,957	7,483	3.3%	1.007	1.326	< 0.0001
Default_90	HPA<=-20%	21,854	9,976	45.6%	20,912	7,077	33.8%	1.349	1.234	< 0.0001
	-20%<HPA<=0%	44,092	8,358	19.0%	61,640	9,119	14.8%	1.261	1.362	< 0.0001
	0%<HPA<=20%	63,349	5,535	8.7%	196,782	15,587	7.9%	1.103	1.473	< 0.0001
	20%<HPA	37,426	1,882	5.0%	225,957	11,695	5.2%	0.972	1.334	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	9,976	1,124	11.3%	7,077	1,222	17.3%	0.653	0.832	< 0.0001
	-20%<HPA<=0%	8,358	1,986	23.8%	9,119	3,040	33.3%	0.713	0.919	0.0178
	0%<HPA<=20%	5,535	2,026	36.6%	15,587	6,978	44.8%	0.818	0.947	0.1115
	20%<HPA	1,882	1,125	59.8%	11,695	6,604	56.5%	1.059	1.233	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
GT95 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated and Active Loans

		GT95 Uninsured			GT95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	35,323	18,774	53.1%	28,024	7,597	27.1%	1.961	1.843	< 0.0001
	-20%<HPA<=0%	68,218	19,038	27.9%	131,023	18,857	14.4%	1.939	2.224	< 0.0001
	0%<HPA<=20%	116,952	21,605	18.5%	490,179	46,409	9.5%	1.951	2.474	< 0.0001
	20%<HPA	63,413	8,734	13.8%	523,286	32,236	6.2%	2.236	2.282	< 0.0001
Default_90	HPA<=-20%	35,323	19,923	56.4%	28,024	8,592	30.7%	1.840	1.899	< 0.0001
	-20%<HPA<=0%	68,218	21,619	31.7%	131,023	23,491	17.9%	1.768	2.251	< 0.0001
	0%<HPA<=20%	116,952	26,902	23.0%	490,179	61,156	12.5%	1.844	2.555	< 0.0001
	20%<HPA	63,413	12,779	20.2%	523,286	45,205	8.6%	2.333	2.641	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	19,923	2,695	13.5%	8,592	2,116	24.6%	0.549	0.676	0.0002
	-20%<HPA<=0%	21,619	6,587	30.5%	23,491	9,195	39.1%	0.778	1.012	0.5952
	0%<HPA<=20%	26,902	13,217	49.1%	61,156	28,213	46.1%	1.065	1.180	< 0.0001
	20%<HPA	12,779	8,376	65.5%	45,205	23,093	51.1%	1.283	1.604	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	33,361	17,953	53.8%	21,721	6,600	30.4%	1.771	1.937	< 0.0001
	-20%<HPA<=0%	33,881	6,661	19.7%	56,257	6,132	10.9%	1.804	1.528	< 0.0001
	0%<HPA<=20%	31,769	2,732	8.6%	154,422	8,995	5.8%	1.476	1.453	< 0.0001
	20%<HPA	13,882	531	3.8%	199,332	5,396	2.7%	1.413	1.596	< 0.0001
Default_90	HPA<=-20%	33,361	18,040	54.1%	21,721	6,792	31.3%	1.729	1.894	< 0.0001
	-20%<HPA<=0%	33,881	6,778	20.0%	56,257	6,480	11.5%	1.737	1.504	< 0.0001
	0%<HPA<=20%	31,769	2,929	9.2%	154,422	10,082	6.5%	1.412	1.443	< 0.0001
	20%<HPA	13,882	704	5.1%	199,332	7,114	3.6%	1.421	1.749	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	18,040	861	4.8%	6,792	511	7.5%	0.634	0.866	0.0248
	-20%<HPA<=0%	6,778	564	8.3%	6,480	870	13.4%	0.620	1.003	0.9591
	0%<HPA<=20%	2,929	524	17.9%	10,082	2,142	21.2%	0.842	1.176	0.0615
	20%<HPA	704	285	40.5%	7,114	2,681	37.7%	1.074	1.435	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	8,105	4,821	59.5%	9,072	3,041	33.5%	1.774	1.808	< 0.0001
	-20%<HPA<=0%	16,143	2,971	18.4%	26,977	2,940	10.9%	1.689	1.375	< 0.0001
	0%<HPA<=20%	23,205	1,868	8.0%	95,859	5,803	6.1%	1.330	1.403	< 0.0001
	20%<HPA	10,140	391	3.9%	126,861	4,331	3.4%	1.129	1.310	< 0.0001
Default_90	HPA<=-20%	8,105	4,843	59.8%	9,072	3,106	34.2%	1.745	1.788	< 0.0001
	-20%<HPA<=0%	16,143	3,010	18.6%	26,977	3,120	11.6%	1.612	1.340	< 0.0001
	0%<HPA<=20%	23,205	1,971	8.5%	95,859	6,565	6.8%	1.240	1.368	< 0.0001
	20%<HPA	10,140	481	4.7%	126,861	5,608	4.4%	1.073	1.351	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	4,843	234	4.8%	3,106	237	7.6%	0.633	0.925	0.4336
	-20%<HPA<=0%	3,010	252	8.4%	3,120	509	16.3%	0.513	0.767	0.0017
	0%<HPA<=20%	1,971	315	16.0%	6,565	1,579	24.1%	0.664	0.871	0.0508
	20%<HPA	481	178	37.0%	5,608	2,105	37.5%	0.986	1.287	0.0135

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
GT95 CLTV - Insurance Variable
Loan Population 1: All loans in the filtered dataset
Terminated Loans

		GT95 Uninsured			GT95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	15,675	10,695	68.2%	14,576	4,421	30.3%	2.250	2.182	< 0.0001
	-20%<HPA<=0%	23,624	7,309	30.9%	63,674	10,611	16.7%	1.857	1.698	< 0.0001
	0%<HPA<=20%	37,154	6,977	18.8%	245,040	28,573	11.7%	1.610	1.971	< 0.0001
	20%<HPA	15,031	2,327	15.5%	330,249	22,211	6.7%	2.302	2.377	< 0.0001
Default_90	HPA<=-20%	15,675	10,733	68.5%	14,576	4,647	31.9%	2.148	2.091	< 0.0001
	-20%<HPA<=0%	23,624	7,425	31.4%	63,674	11,366	17.9%	1.761	1.652	< 0.0001
	0%<HPA<=20%	37,154	7,352	19.8%	245,040	31,500	12.9%	1.539	1.964	< 0.0001
	20%<HPA	15,031	2,874	19.1%	330,249	26,905	8.1%	2.347	2.755	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	10,733	570	5.3%	4,647	685	14.7%	0.360	0.764	0.0001
	-20%<HPA<=0%	7,425	894	12.0%	11,366	2,266	19.9%	0.604	0.990	0.8306
	0%<HPA<=20%	7,352	1,872	25.5%	31,500	7,384	23.4%	1.086	1.274	< 0.0001
	20%<HPA	2,874	1,366	47.5%	26,905	8,918	33.1%	1.434	1.996	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated and Active Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	80,539	36,246	45.0%	44,408	13,480	30.4%	1.483	1.179	< 0.0001
	-20%<HPA<=0%	90,231	17,320	19.2%	109,852	13,770	12.5%	1.531	1.142	< 0.0001
	0%<HPA<=20%	92,784	7,194	7.8%	267,317	15,215	5.7%	1.362	1.182	< 0.0001
	20%<HPA	60,436	1,818	3.0%	278,755	6,599	2.4%	1.271	1.250	< 0.0001
Default_90	HPA<=-20%	80,539	38,415	47.7%	44,408	14,876	33.5%	1.424	1.111	< 0.0001
	-20%<HPA<=0%	90,231	19,359	21.5%	109,852	16,567	15.1%	1.423	1.130	< 0.0001
	0%<HPA<=20%	92,784	8,883	9.6%	267,317	19,664	7.4%	1.301	1.193	< 0.0001
	20%<HPA	60,436	2,811	4.7%	278,755	10,519	3.8%	1.233	1.264	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	38,415	4,824	12.6%	14,876	2,515	16.9%	0.743	0.944	0.0491
	-20%<HPA<=0%	19,359	4,187	21.6%	16,567	4,854	29.3%	0.738	0.993	0.8050
	0%<HPA<=20%	8,883	3,254	36.6%	19,664	7,423	37.7%	0.970	1.109	0.0004
	20%<HPA	2,811	1,663	59.2%	10,519	5,819	55.3%	1.069	1.154	0.0017

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated and Active Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	21,854	9,496	43.5%	19,414	6,239	32.1%	1.352	1.158	< 0.0001
	-20%<HPA<=0%	44,092	7,392	16.8%	53,427	6,836	12.8%	1.310	1.117	< 0.0001
	0%<HPA<=20%	63,349	4,491	7.1%	163,582	9,323	5.7%	1.244	1.220	< 0.0001
	20%<HPA	37,426	1,248	3.3%	181,614	5,244	2.9%	1.155	1.193	< 0.0001
Default_90	HPA<=-20%	21,854	9,976	45.6%	19,414	6,828	35.2%	1.298	1.132	< 0.0001
	-20%<HPA<=0%	44,092	8,358	19.0%	53,427	8,225	15.4%	1.231	1.111	< 0.0001
	0%<HPA<=20%	63,349	5,535	8.7%	163,582	12,360	7.6%	1.156	1.208	< 0.0001
	20%<HPA	37,426	1,882	5.0%	181,614	8,449	4.7%	1.061	1.166	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	9,976	1,124	11.3%	6,828	1,139	16.7%	0.675	0.798	< 0.0001
	-20%<HPA<=0%	8,358	1,986	23.8%	8,225	2,596	31.6%	0.753	0.914	0.0145
	0%<HPA<=20%	5,535	2,026	36.6%	12,360	5,353	43.3%	0.845	0.956	0.0122
	20%<HPA	1,882	1,125	59.8%	8,449	4,914	58.2%	1.028	1.070	0.2191

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	33,361	17,953	53.8%	19,815	6,399	32.3%	1.666	1.780	< 0.0001
	-20%<HPA<=0%	33,881	6,661	19.7%	48,479	5,620	11.6%	1.696	1.287	< 0.0001
	0%<HPA<=20%	31,769	2,732	8.6%	131,518	7,565	5.8%	1.495	1.175	< 0.0001
	20%<HPA	13,882	531	3.8%	157,011	3,550	2.3%	1.692	1.317	< 0.0001
Default_90	HPA<=-20%	33,361	18,040	54.1%	19,815	6,575	33.2%	1.630	1.737	< 0.0001
	-20%<HPA<=0%	33,881	6,778	20.0%	48,479	5,891	12.2%	1.646	1.269	< 0.0001
	0%<HPA<=20%	31,769	2,929	9.2%	131,518	8,358	6.4%	1.451	1.184	< 0.0001
	20%<HPA	13,882	704	5.1%	157,011	4,683	3.0%	1.700	1.437	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	18,040	861	4.8%	6,575	470	7.1%	0.668	0.813	0.0011
	-20%<HPA<=0%	6,778	564	8.3%	5,891	727	12.3%	0.674	0.984	0.8091
	0%<HPA<=20%	2,929	524	17.9%	8,358	1,608	19.2%	0.930	1.138	0.0308
	20%<HPA	704	285	40.5%	4,683	1,709	36.5%	1.109	1.412	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	8,105	4,821	59.5%	8,283	2,914	35.2%	1.691	1.631	< 0.0001
	-20%<HPA<=0%	16,143	2,971	18.4%	22,896	2,604	11.4%	1.618	1.102	0.0024
	0%<HPA<=20%	23,205	1,868	8.0%	79,008	4,389	5.6%	1.449	1.133	< 0.0001
	20%<HPA	10,140	391	3.9%	98,521	2,730	2.8%	1.392	1.122	0.0503
Default_90	HPA<=-20%	8,105	4,843	59.8%	8,283	2,970	35.9%	1.666	1.613	< 0.0001
	-20%<HPA<=0%	16,143	3,010	18.6%	22,896	2,743	12.0%	1.556	1.080	0.0143
	0%<HPA<=20%	23,205	1,971	8.5%	79,008	4,922	6.2%	1.363	1.179	0.0002
	20%<HPA	10,140	481	4.7%	98,521	3,589	3.6%	1.302	1.158	0.0059
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	4,843	234	4.8%	2,970	216	7.3%	0.664	0.670	0.1649
	-20%<HPA<=0%	3,010	252	8.4%	2,743	413	15.1%	0.556	0.769	0.0029
	0%<HPA<=20%	1,971	315	16.0%	4,922	1,117	22.7%	0.704	0.873	0.0610
	20%<HPA	481	178	37.0%	3,589	1,363	38.0%	0.974	1.204	0.0792

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 3: ORM loans excluding FHA and GT95 CLTV
Terminated and Active Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	3,145	519	16.5%	6,006	1,053	17.5%	0.941	0.980	0.7296
	-20%<HPA<=0%	8,817	454	5.1%	20,819	1,200	5.8%	0.893	1.018	0.7625
	0%<HPA<=20%	14,544	261	1.8%	67,874	1,317	1.9%	0.925	1.096	0.1842
	20%<HPA	12,697	78	0.6%	90,049	796	0.9%	0.695	0.836	0.1343
Default_90	HPA<=-20%	3,145	582	18.5%	6,006	1,175	19.6%	0.946	0.990	0.8664
	-20%<HPA<=0%	8,817	536	6.1%	20,819	1,431	6.9%	0.884	1.017	0.7538
	0%<HPA<=20%	14,544	344	2.4%	67,874	1,740	2.6%	0.923	1.091	0.1483
	20%<HPA	12,697	133	1.0%	90,049	1,296	1.4%	0.728	0.868	0.1250
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	582	87	14.9%	1,175	164	14.0%	1.071	NA	NA
	-20%<HPA<=0%	536	129	24.1%	1,431	351	24.5%	0.981	NA	NA
	0%<HPA<=20%	344	114	33.1%	1,740	596	34.3%	0.967	0.942	0.6377
	20%<HPA	133	78	58.6%	1,296	649	50.1%	1.171	1.419	0.0531

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 3: ORM loans excluding FHA and GT95 CLTV
Terminated and Active Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	2,269	436	19.2%	3,187	609	19.1%	1.006	1.001	0.9860
	-20%<HPA<=0%	7,967	467	5.9%	11,795	650	5.5%	1.064	1.070	0.8728
	0%<HPA<=20%	14,238	279	2.0%	47,684	844	1.8%	1.107	1.121	0.1031
	20%<HPA	9,254	77	0.8%	62,894	649	1.0%	0.806	0.867	0.2416
Default_90	HPA<=-20%	2,269	482	21.2%	3,187	672	21.1%	1.007	1.000	0.9964
	-20%<HPA<=0%	7,967	555	7.0%	11,795	787	6.7%	1.044	1.001	0.9907
	0%<HPA<=20%	14,238	360	2.5%	47,684	1,164	2.4%	1.036	1.055	0.3845
	20%<HPA	9,254	121	1.3%	62,894	1,028	1.6%	0.800	0.847	0.0887
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	482	66	13.7%	672	84	12.5%	1.095	NA	NA
	-20%<HPA<=0%	555	133	24.0%	787	199	25.3%	0.948	NA	NA
	0%<HPA<=20%	360	124	34.4%	1,164	437	37.5%	0.917	0.887	0.3463
	20%<HPA	121	59	48.8%	1,028	539	52.4%	0.930	0.863	0.4512

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 3: ORM loans excluding FHA and GT95 CLTV
Terminated Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	575	192	33.4%	1,988	400	20.1%	1.660	1.842	< 0.0001
	-20%<HPA<=0%	2,626	157	6.0%	8,532	403	4.7%	1.266	1.255	0.0237
	0%<HPA<=20%	3,531	98	2.8%	37,251	640	1.7%	1.615	1.462	0.0008
	20%<HPA	1,198	16	1.3%	56,881	517	0.9%	1.469	1.259	0.3751
Default_90	HPA<=-20%	575	193	33.6%	1,988	408	20.5%	1.635	1.808	< 0.0001
	-20%<HPA<=0%	2,626	159	6.1%	8,532	424	5.0%	1.218	1.210	0.0546
	0%<HPA<=20%	3,531	108	3.1%	37,251	720	1.9%	1.582	1.459	0.0005
	20%<HPA	1,198	21	1.8%	56,881	685	1.2%	1.456	1.202	0.4175
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	193	4	2.1%	408	21	5.1%	0.403	na	na
	-20%<HPA<=0%	159	10	6.3%	424	46	10.8%	0.580	0.555	0.1061
	0%<HPA<=20%	108	17	15.7%	720	126	17.5%	0.899	na	na
	20%<HPA	21	9	42.9%	685	221	32.3%	1.328	na	na

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 3: ORM loans excluding FHA and GT95 CLTV
Terminated Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	460	188	40.9%	1,016	214	21.1%	1.940	2.276	< 0.0001
	-20%<HPA<=0%	2,426	151	6.2%	4,621	227	4.9%	1.267	1.050	0.6586
	0%<HPA<=20%	4,175	117	2.8%	24,426	402	1.6%	1.703	1.328	0.0094
	20%<HPA	1,459	21	1.4%	37,396	419	1.1%	1.285	1.077	0.7445
Default_90	HPA<=-20%	460	190	41.3%	1,016	217	21.4%	1.934	2.278	< 0.0001
	-20%<HPA<=0%	2,426	152	6.3%	4,621	235	5.1%	1.232	1.034	0.7597
	0%<HPA<=20%	4,175	124	3.0%	24,426	467	1.9%	1.553	1.243	0.0388
	20%<HPA	1,459	27	1.9%	37,396	545	1.5%	1.270	1.034	0.8705
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	190	8	4.2%	217	9	4.1%	1.015	na	na
	-20%<HPA<=0%	152	6	3.9%	235	14	6.0%	0.663	0.669	0.4229
	0%<HPA<=20%	124	17	13.7%	467	96	20.6%	0.667	na	na
	20%<HPA	27	7	25.9%	545	186	34.1%	0.760	na	na

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	59,350	28,946	48.8%	16,736	5,624	33.6%	1.451	1.302	< 0.0001
	-20%<HPA<=0%	51,992	12,936	24.9%	31,107	4,017	12.9%	1.927	1.432	< 0.0001
	0%<HPA<=20%	39,084	4,652	11.9%	64,135	3,874	6.0%	1.970	1.421	< 0.0001
	20%<HPA	22,787	1,122	4.9%	59,026	1,792	3.0%	1.622	1.364	< 0.0001
Default_90	HPA<=-20%	59,350	30,531	51.4%	16,736	6,067	36.3%	1.419	1.298	< 0.0001
	-20%<HPA<=0%	51,992	14,247	27.4%	31,107	4,615	14.8%	1.847	1.438	< 0.0001
	0%<HPA<=20%	39,084	5,675	14.5%	64,135	4,713	7.3%	1.976	1.495	< 0.0001
	20%<HPA	22,787	1,702	7.5%	59,026	2,464	4.2%	1.769	1.514	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	30,531	3,849	12.6%	6,067	961	15.8%	0.796	0.877	0.0015
	-20%<HPA<=0%	14,247	2,986	21.0%	4,615	1,212	26.3%	0.798	0.944	0.1777
	0%<HPA<=20%	5,675	2,156	38.0%	4,713	1,562	33.1%	1.146	1.247	< 0.0001
	20%<HPA	1,702	1,070	62.9%	2,464	1,058	42.9%	1.464	1.629	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	12,775	6,624	51.9%	7,163	2,589	36.1%	1.435	1.405	< 0.0001
	-20%<HPA<=0%	18,620	4,397	23.6%	15,402	2,112	13.7%	1.722	1.380	< 0.0001
	0%<HPA<=20%	20,938	2,622	12.5%	38,098	2,435	6.4%	1.959	1.436	< 0.0001
	20%<HPA	11,084	833	7.5%	34,570	1,161	3.4%	2.238	1.484	< 0.0001
Default_90	HPA<=-20%	12,775	6,897	54.0%	7,163	2,782	38.8%	1.390	1.354	< 0.0001
	-20%<HPA<=0%	18,620	4,932	26.5%	15,402	2,482	16.1%	1.644	1.362	< 0.0001
	0%<HPA<=20%	20,938	3,220	15.4%	38,098	2,978	7.8%	1.967	1.528	< 0.0001
	20%<HPA	11,084	1,238	11.2%	34,570	1,609	4.7%	2.400	1.636	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	6,897	774	11.2%	2,782	443	15.9%	0.705	0.667	< 0.0001
	-20%<HPA<=0%	4,932	1,247	25.3%	2,482	739	29.8%	0.849	0.886	0.0363
	0%<HPA<=20%	3,220	1,297	40.3%	2,978	1,099	36.9%	1.091	1.172	0.0042
	20%<HPA	1,238	782	63.2%	1,609	741	46.1%	1.372	1.468	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	25,776	13,994	54.3%	9,266	2,698	29.1%	1.865	2.231	< 0.0001
	-20%<HPA<=0%	19,599	4,839	24.7%	18,454	1,647	8.9%	2.766	2.069	< 0.0001
	0%<HPA<=20%	12,737	1,599	12.6%	44,173	2,308	5.2%	2.403	1.610	< 0.0001
	20%<HPA	3,685	250	6.8%	46,307	1,318	2.8%	2.384	1.533	< 0.0001
Default_90	HPA<=-20%	25,776	14,062	54.6%	9,266	2,749	29.7%	1.839	2.202	< 0.0001
	-20%<HPA<=0%	19,599	4,919	25.1%	18,454	1,712	9.3%	2.706	2.059	< 0.0001
	0%<HPA<=20%	12,737	1,714	13.5%	44,173	2,541	5.8%	2.339	1.641	< 0.0001
	20%<HPA	3,685	326	8.8%	46,307	1,674	3.6%	2.447	1.794	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	14,062	730	5.2%	2,749	173	6.3%	0.825	0.926	0.3935
	-20%<HPA<=0%	4,919	414	8.4%	1,712	196	11.4%	0.739	na	na
	0%<HPA<=20%	1,714	331	19.3%	2,541	487	19.2%	1.008	1.280	0.0044
	20%<HPA	326	149	45.7%	1,674	539	32.2%	1.419	2.044	< 0.0001

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	5,229	3,287	62.9%	3,878	1,181	30.5%	2.064	2.092	< 0.0001
	-20%<HPA<=0%	6,884	1,669	24.2%	9,085	838	9.2%	2.628	1.539	< 0.0001
	0%<HPA<=20%	7,833	940	12.0%	27,837	1,330	4.8%	2.512	1.523	< 0.0001
	20%<HPA	2,368	207	8.7%	27,497	799	2.9%	3.008	1.640	< 0.0001
Default_90	HPA<=-20%	5,229	3,305	63.2%	3,878	1,198	30.9%	2.046	2.088	< 0.0001
	-20%<HPA<=0%	6,884	1,685	24.5%	9,085	873	9.6%	2.547	1.518	< 0.0001
	0%<HPA<=20%	7,833	991	12.7%	27,837	1,491	5.4%	2.362	1.510	< 0.0001
	20%<HPA	2,368	245	10.3%	27,497	1,011	3.7%	2.814	1.761	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	3,305	179	5.4%	1,198	79	6.6%	0.821	0.895	0.4368
	-20%<HPA<=0%	1,685	163	9.7%	873	117	13.4%	0.722	na	na
	0%<HPA<=20%	991	192	19.4%	1,491	329	22.1%	0.878	1.064	0.5606
	20%<HPA	245	91	37.1%	1,011	329	32.5%	1.141	1.389	0.0418

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans

		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	1,182	213	18.0%	1,549	249	16.1%	1.121	1.199	0.0883
	-20%<HPA<=0%	2,905	169	5.8%	5,217	244	4.7%	1.244	1.486	0.0002
	0%<HPA<=20%	5,531	121	2.2%	14,374	269	1.9%	1.169	1.311	0.0168
	20%<HPA	6,209	35	0.6%	16,634	289	1.7%	0.324	0.481	< 0.0001
Default_90	HPA<=-20%	1,182	240	20.3%	1,549	272	17.6%	1.156	1.267	0.0206
	-20%<HPA<=0%	2,905	202	7.0%	5,217	278	5.3%	1.306	1.573	< 0.0001
	0%<HPA<=20%	5,531	161	2.9%	14,374	334	2.3%	1.253	1.388	0.0010
	20%<HPA	6,209	61	1.0%	16,634	393	2.4%	0.416	0.573	< 0.0001
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	240	39	16.3%	272	32	11.8%	1.381	na	na
	-20%<HPA<=0%	202	48	23.8%	278	53	19.1%	1.246	na	na
	0%<HPA<=20%	161	54	33.5%	334	102	30.5%	1.098	na	na
	20%<HPA	61	40	65.6%	393	135	34.4%	1.909	2.736	0.0009

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans

		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	582	146	25.1%	708	122	17.2%	1.456	1.432	0.0116
	-20%<HPA<=0%	1,944	157	8.1%	2,725	133	4.9%	1.655	1.450	0.0031
	0%<HPA<=20%	3,437	99	2.9%	9,851	180	1.8%	1.576	1.438	0.0050
	20%<HPA	2,650	29	1.1%	10,940	177	1.6%	0.676	0.835	0.3807
Default_90	HPA<=-20%	582	157	27.0%	708	128	18.1%	1.492	1.488	0.0043
	-20%<HPA<=0%	1,944	184	9.5%	2,725	146	5.4%	1.767	1.569	0.0001
	0%<HPA<=20%	3,437	130	3.8%	9,851	226	2.3%	1.649	1.495	0.0004
	20%<HPA	2,650	49	1.8%	10,940	227	2.1%	0.891	1.011	0.9474
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	157	16	10.2%	128	8	6.3%	1.631	na	na
	-20%<HPA<=0%	184	43	23.4%	146	20	13.7%	1.706	na	na
	0%<HPA<=20%	130	50	38.5%	226	64	28.3%	1.358	na	na
	20%<HPA	49	25	51.0%	227	74	32.6%	1.565	1.736	0.0916

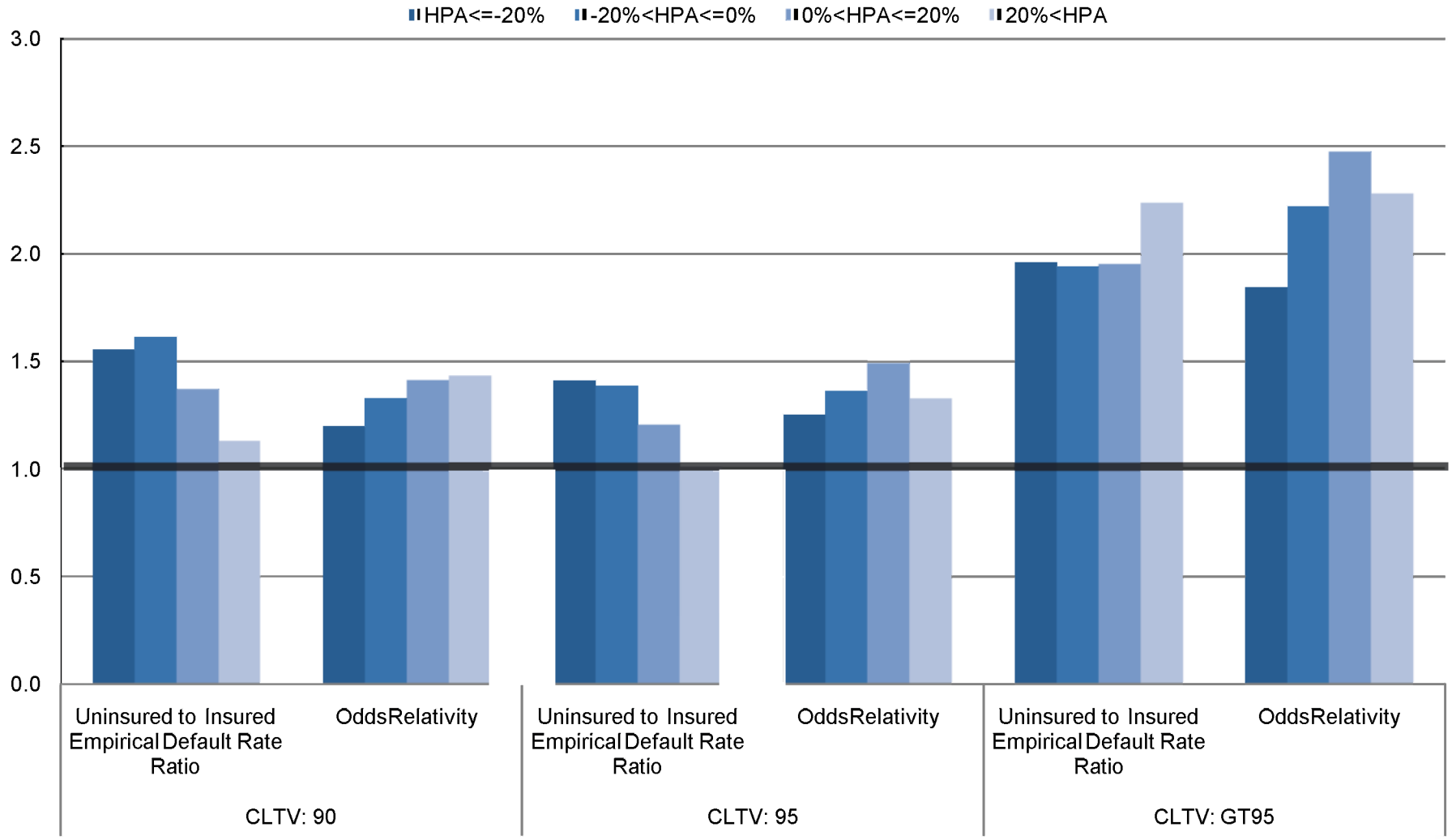
Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
90 CLTV - Insurance Variable
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans

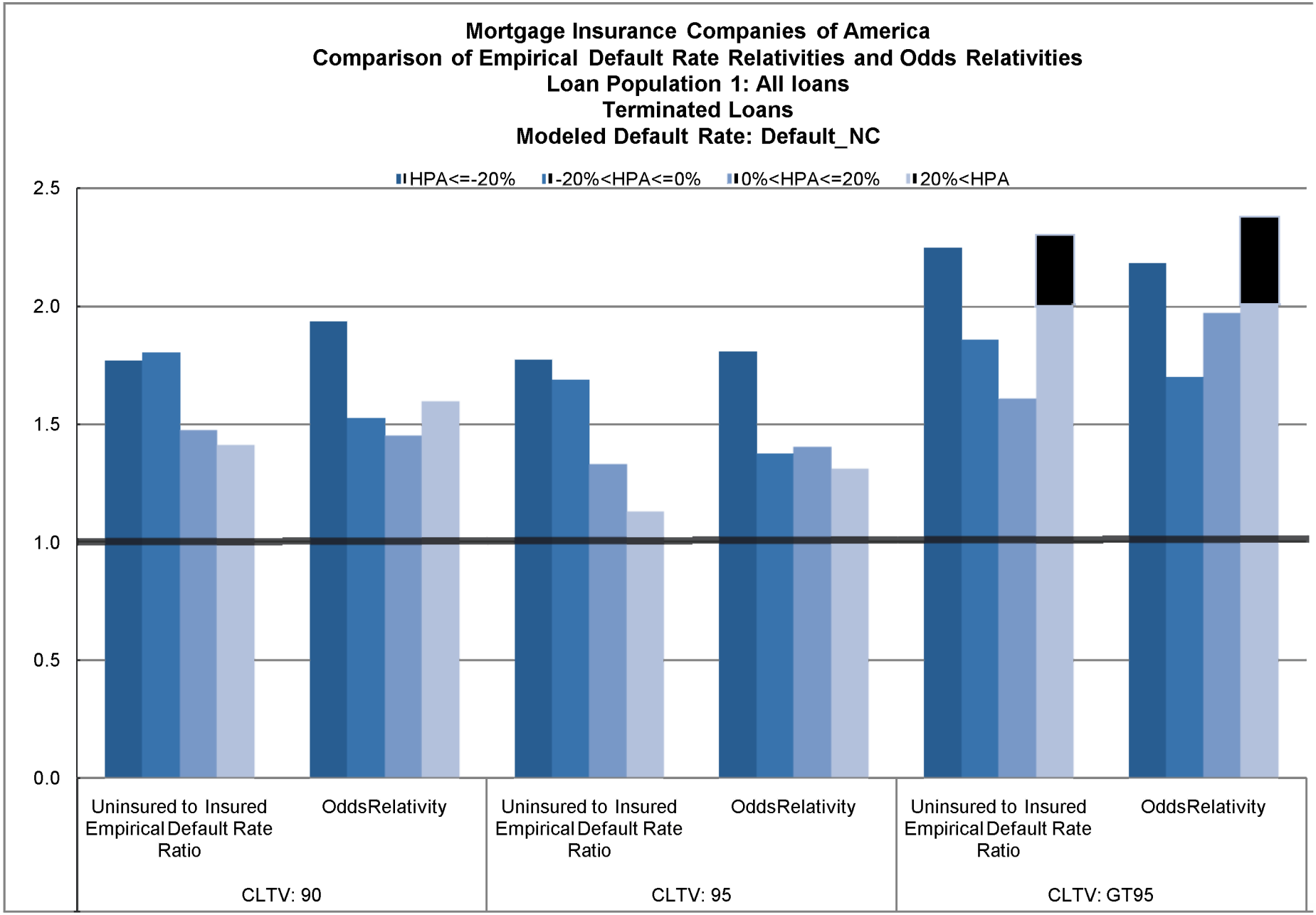
		90 Uninsured			90 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	256	78	30.5%	835	102	12.2%	2.494	2.542	< 0.0001
	-20%<HPA<=0%	881	50	5.7%	3,606	92	2.6%	2.224	2.355	< 0.0001
	0%<HPA<=20%	1,123	33	2.9%	11,721	191	1.6%	1.803	1.825	0.0023
	20%<HPA	322	3	0.9%	14,212	265	1.9%	0.500	0.407	0.1343
Default_90	HPA<=-20%	256	79	30.9%	835	106	12.7%	2.431	2.539	< 0.0001
	-20%<HPA<=0%	881	52	5.9%	3,606	97	2.7%	2.194	2.323	< 0.0001
	0%<HPA<=20%	1,123	37	3.3%	11,721	214	1.8%	1.805	1.856	0.0009
	20%<HPA	322	4	1.2%	14,212	338	2.4%	0.522	0.479	0.0945
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	79	2	2.5%	106	7	6.6%	0.383	na	na
	-20%<HPA<=0%	52	3	5.8%	97	8	8.2%	0.700	na	na
	0%<HPA<=20%	37	4	10.8%	214	41	19.2%	0.564	na	na
	20%<HPA	4	2	50.0%	338	103	30.5%	1.641	na	na

Mortgage Insurance Companies of America
Logistic Model Contrasts and Significance
95 CLTV - Insurance Variable
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans

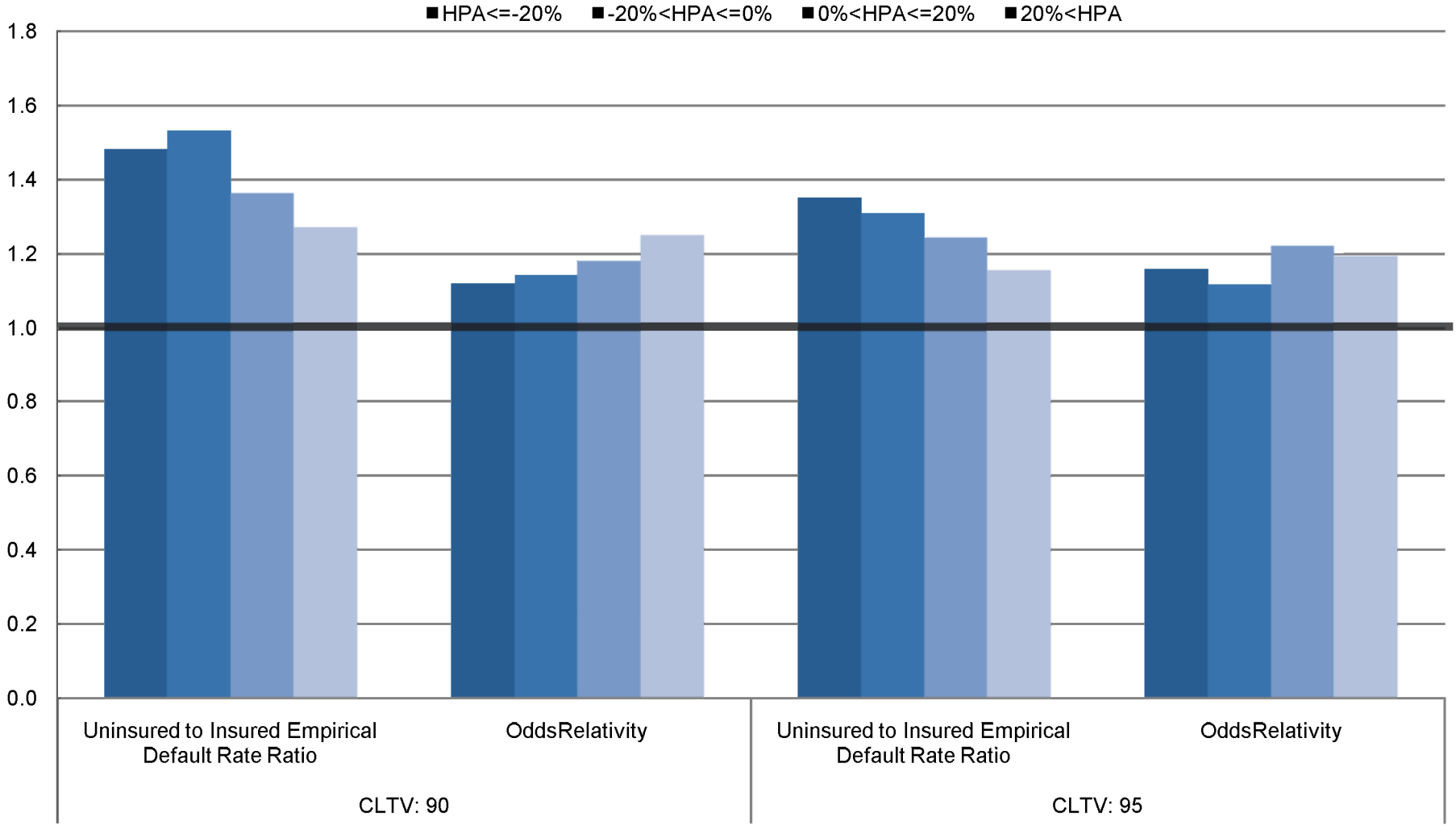
		95 Uninsured			95 Insured			Empirical Default		
Response	HPA Bucket	Loans	Defaults	Default Rate	Loans	Defaults	Default Rate	Relativity	Odds Relativity	p-value
Default_NC	HPA<=-20%	152	62	40.8%	471	59	12.5%	3.256	3.785	< 0.0001
	-20%<HPA<=0%	688	50	7.3%	2,031	69	3.4%	2.139	1.909	0.0012
	0%<HPA<=20%	1,112	39	3.5%	8,430	135	1.6%	2.190	1.845	0.0013
	20%<HPA	220	3	1.4%	9,586	166	1.7%	0.787	0.617	0.4194
Default_90	HPA<=-20%	152	63	41.4%	471	59	12.5%	3.309	4.092	< 0.0001
	-20%<HPA<=0%	688	50	7.3%	2,031	75	3.7%	1.968	1.771	0.0036
	0%<HPA<=20%	1,112	39	3.5%	8,430	157	1.9%	1.883	1.609	0.0111
	20%<HPA	220	4	1.8%	9,586	207	2.2%	0.842	0.659	0.4221
		Defaults	Cures	Cure Rate	Defaults	Cures	Cure Rate			
Cure	HPA<=-20%	63	4	6.3%	59	0	0.0%	na	na	na
	-20%<HPA<=0%	50	2	4.0%	75	7	9.3%	0.429	na	na
	0%<HPA<=20%	39	5	12.8%	157	32	20.4%	0.629	na	na
	20%<HPA	4	1	25.0%	207	63	30.4%	0.821	na	na

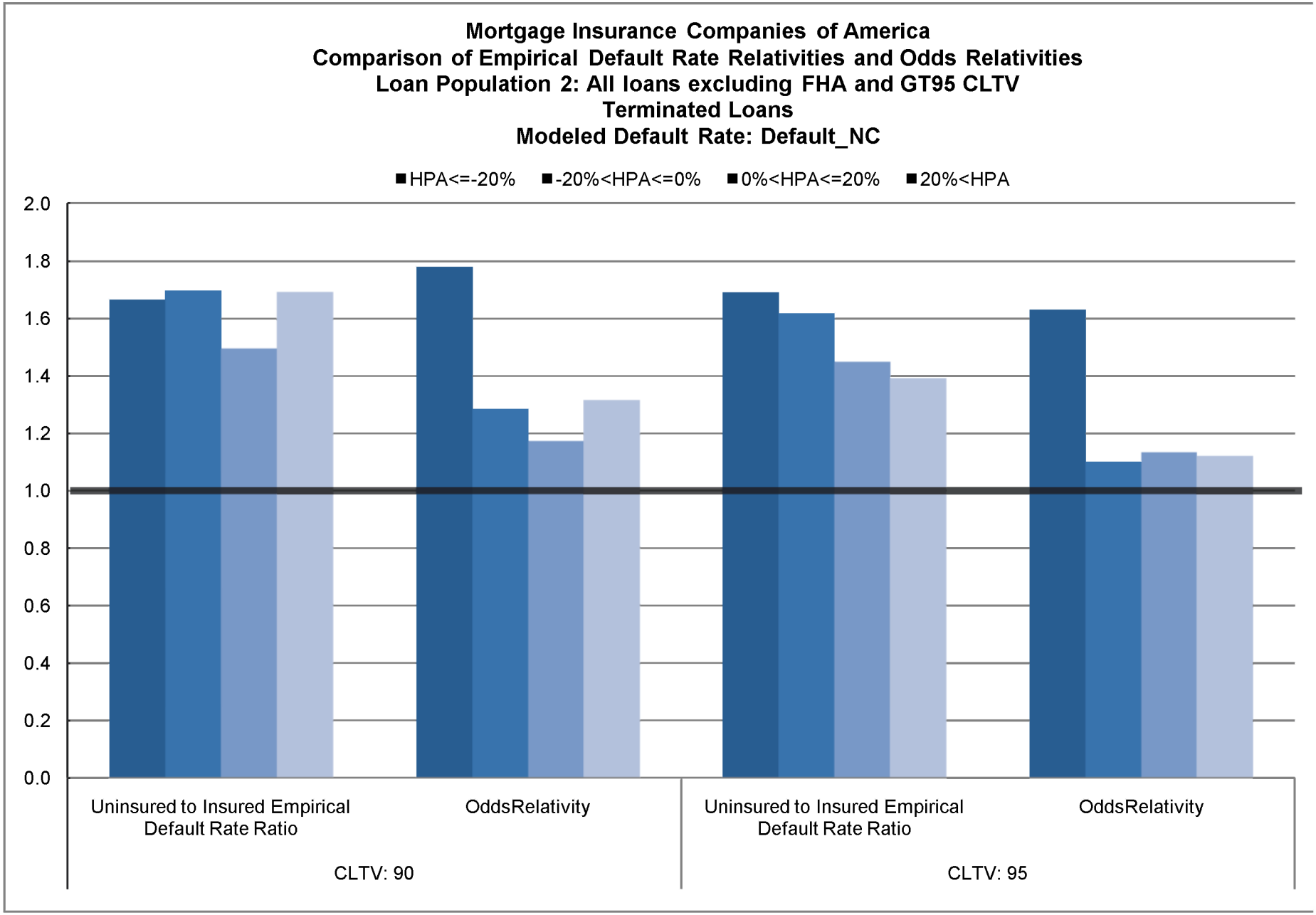
Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 1: All loans
Terminated and Active Loans
Modeled Default Rate: Default_NC

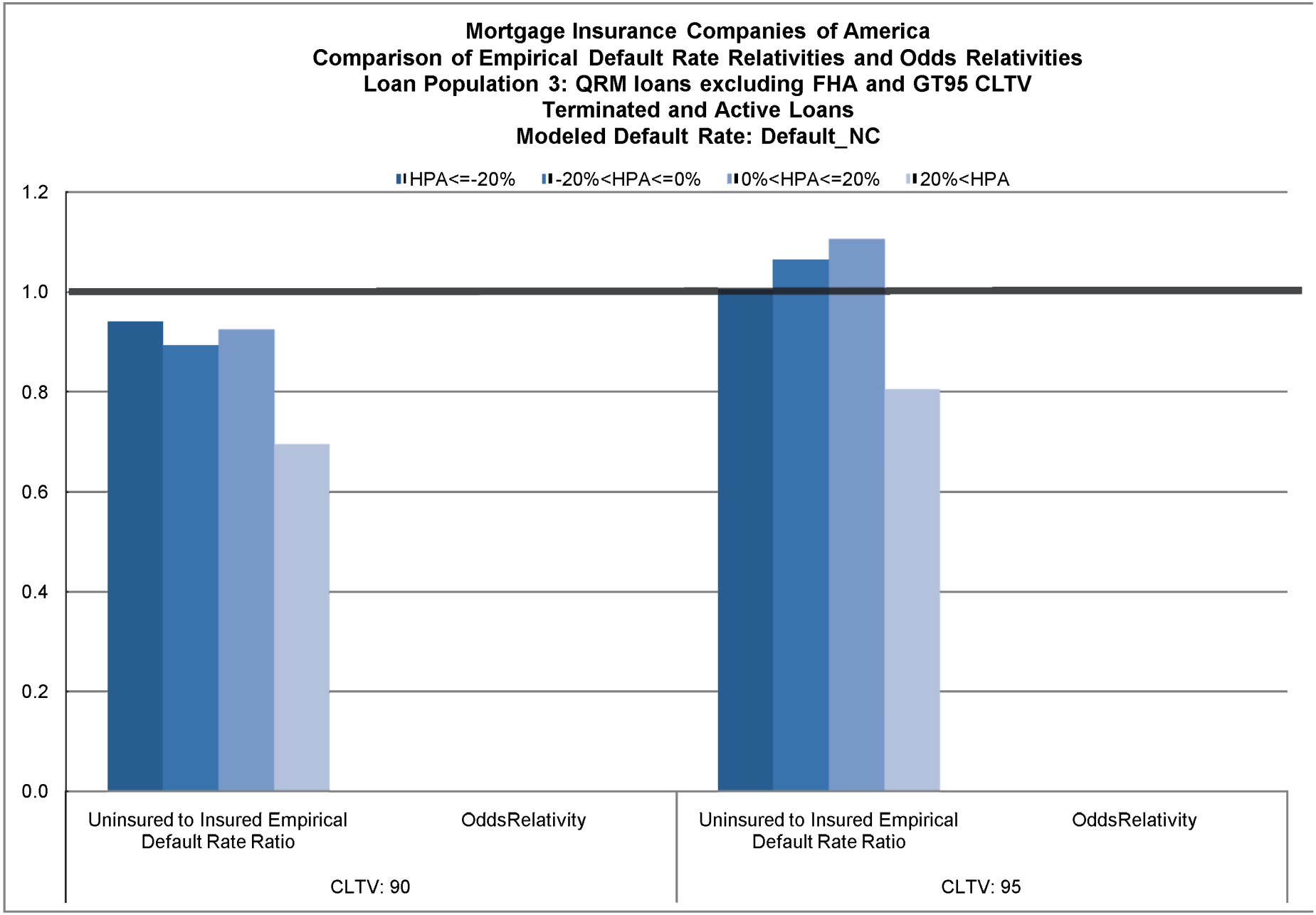


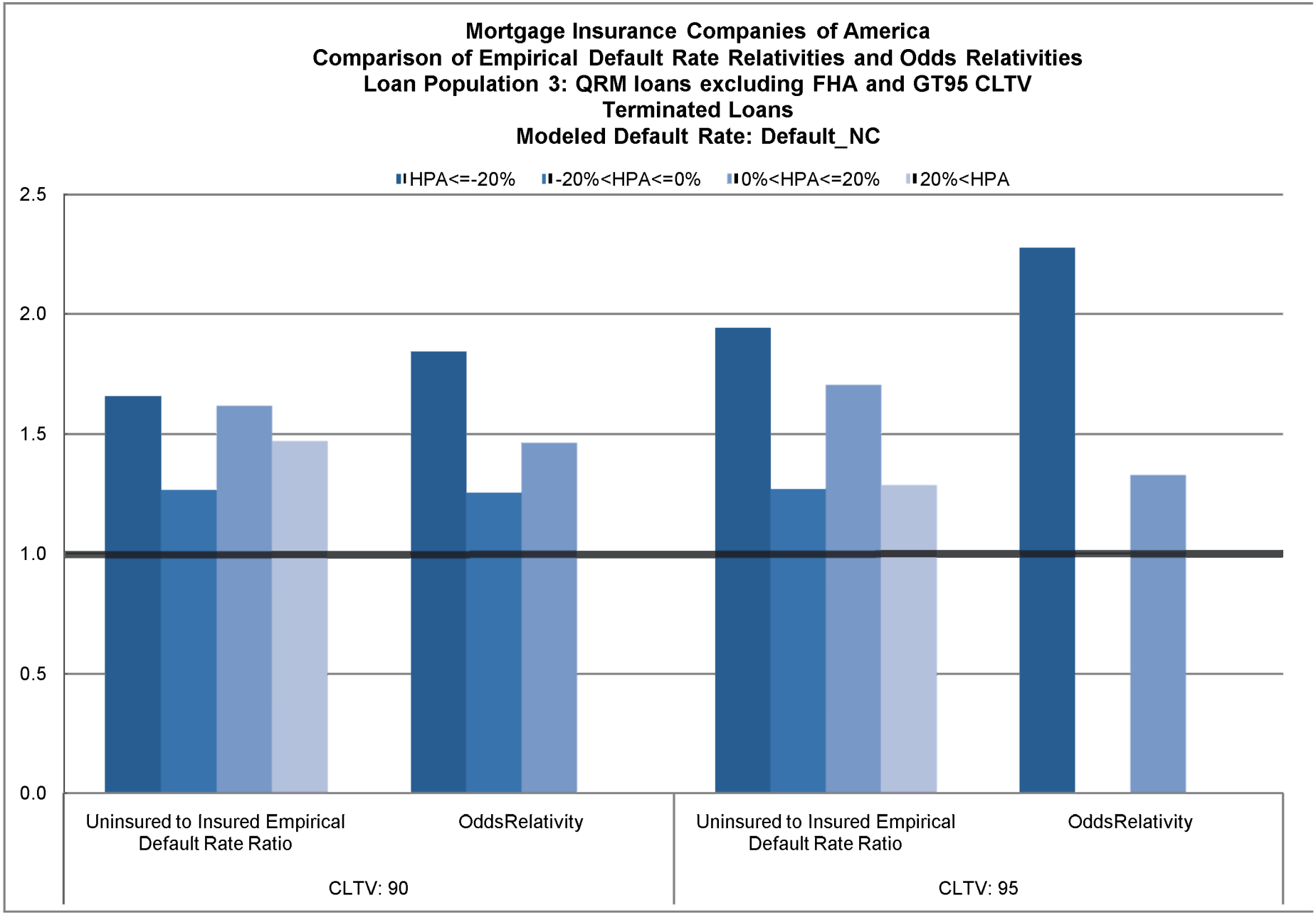

Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 1: All loans
Terminated Loans
Modeled Default Rate: Default_NC
HPA<=-20%
-20%<HPA<=0%
0%<HPA<=20%
20%<HPA
2.5
2.0
1.5
1.0
0.5
0.0
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 90
CLTV: 95
CLTV: GT95

Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Modeled Default Rate: Default_NC

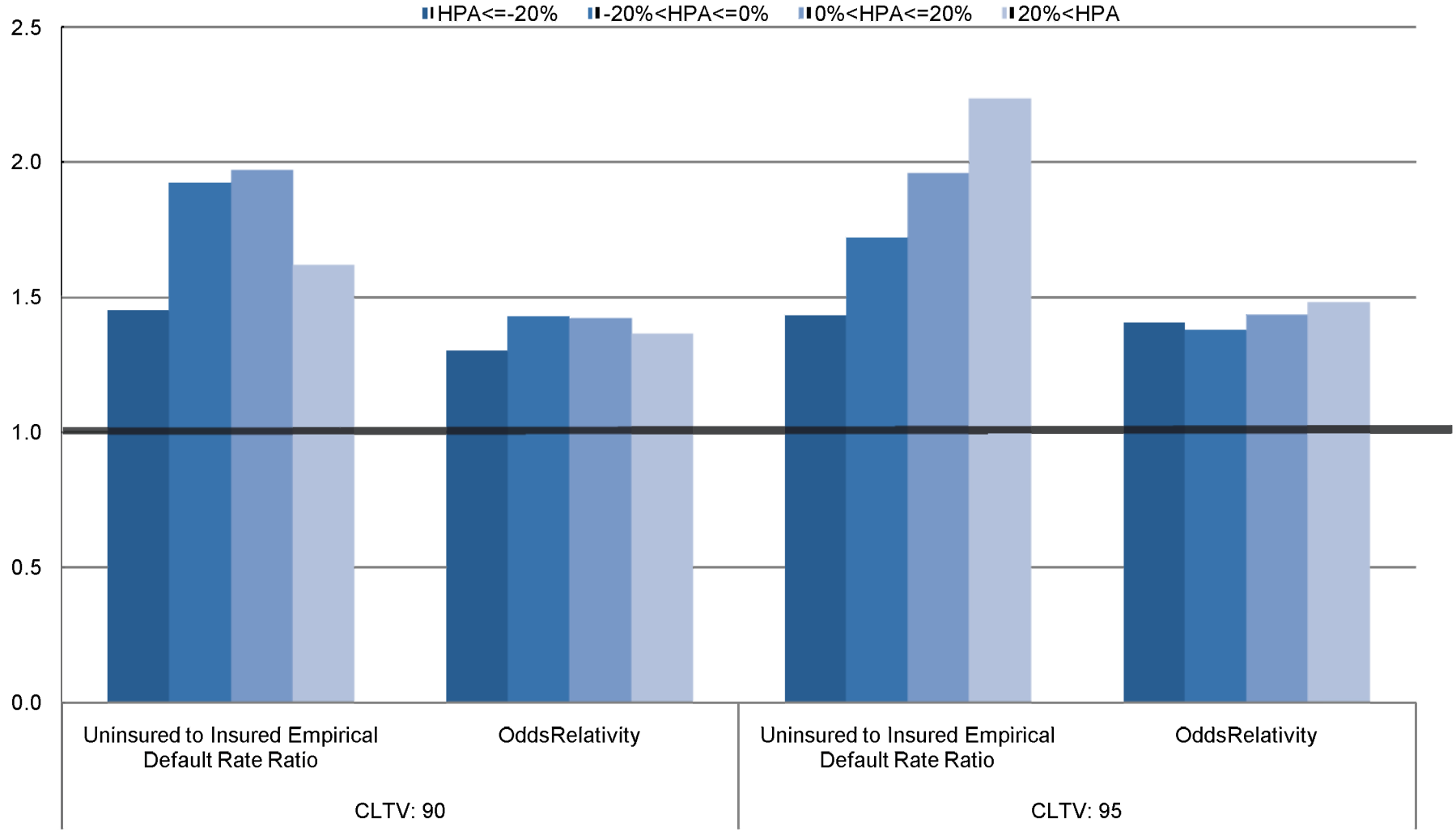



Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 2: All loans excluding FHA and GT95 CLTV
Terminated Loans
Modeled Default Rate: Default_NC
HPA<=-20%
-20%<HPA<=0%
0%<HPA<=20%
20%<HPA
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 90
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 95

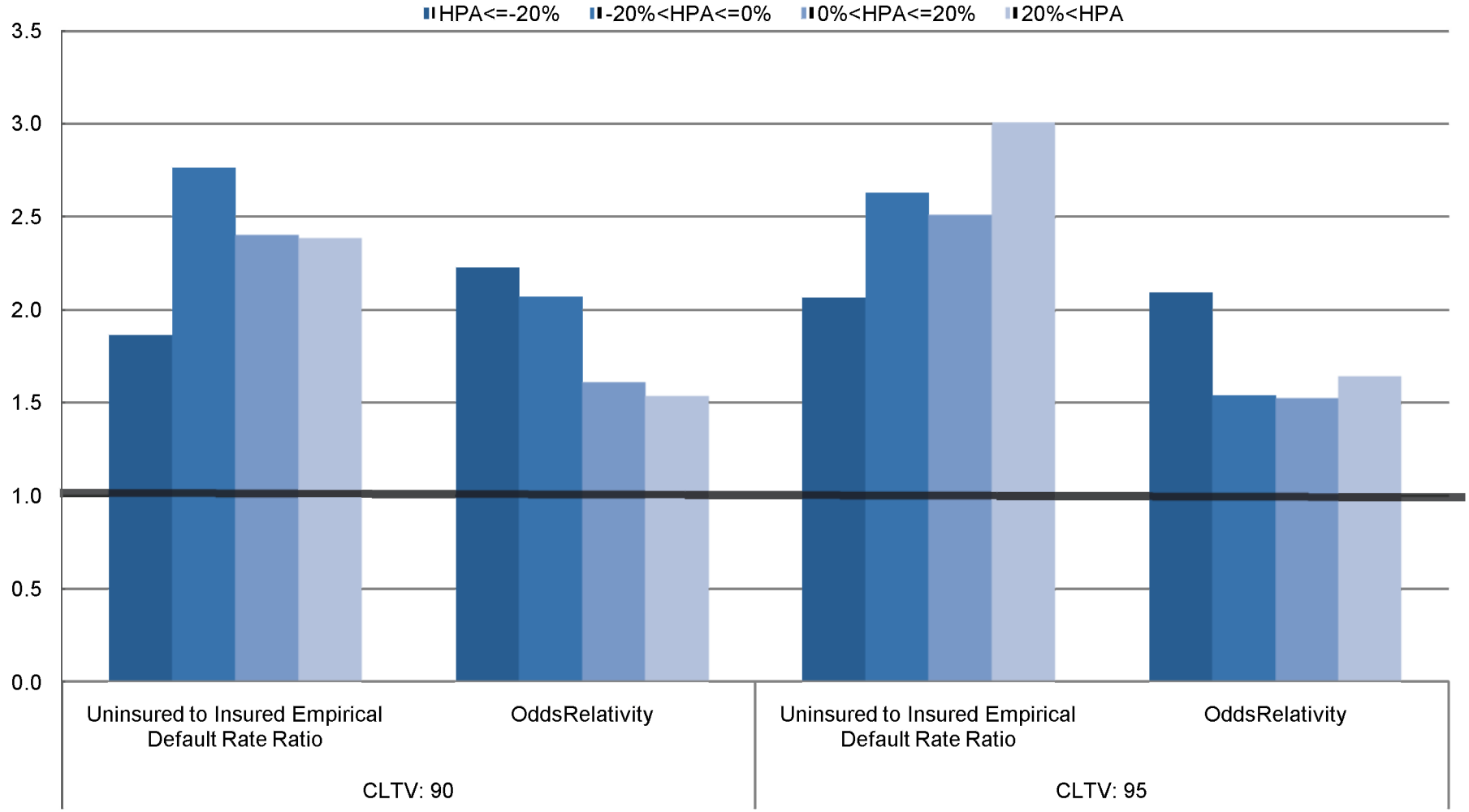

Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated and Active Loans
Modeled Default Rate: Default_NC
HPA<=-20%
-20%<HPA<=0%
0%<HPA<=20%
20%<HPA
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 90
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 95


Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 3: QRM loans excluding FHA and GT95 CLTV
Terminated Loans
Modeled Default Rate: Default_NC
HPA<=-20%
-20%<HPA<=0%
0%<HPA<=20%
20%<HPA
2.5
2.0
1.5
1.0
0.5
0.0
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 90
Uninsured to Insured Empirical Default Rate Ratio
OddsRelativity
CLTV: 95

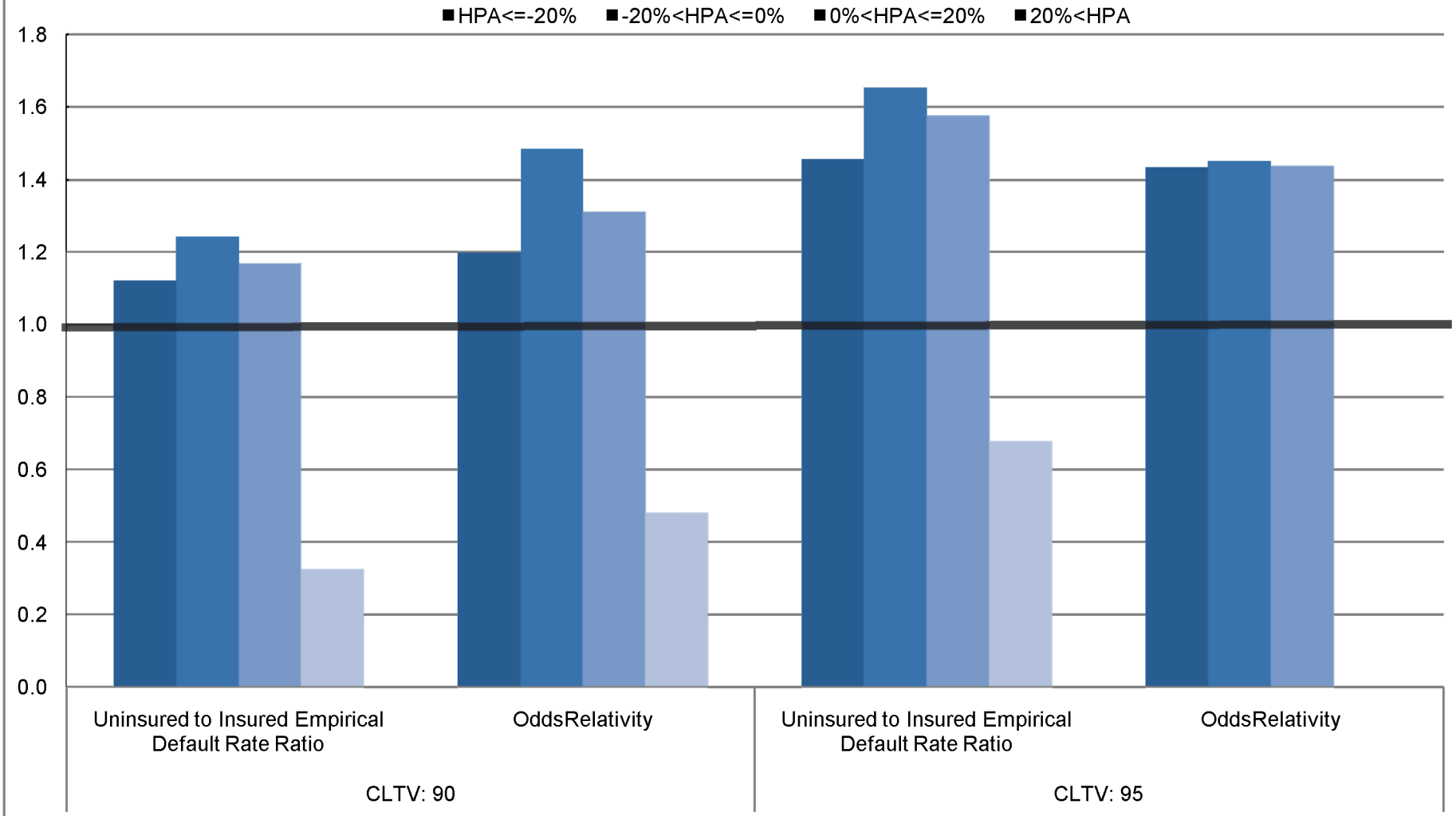
Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Modeled Default Rate: Default_NC



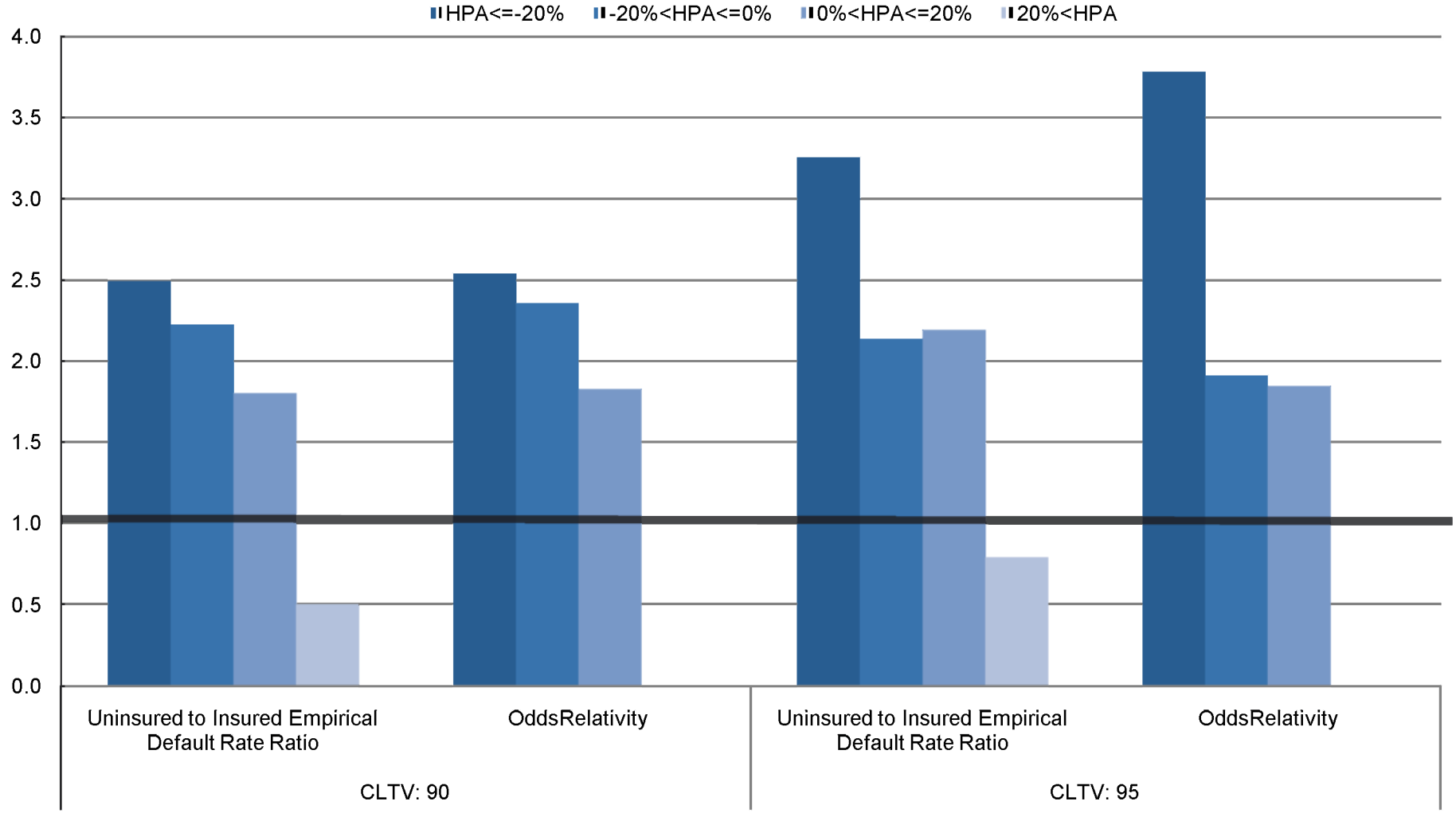
Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 4: All loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Modeled Default Rate: Default_NC



Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated and Active Loans
Modeled Default Rate: Default_NC



Mortgage Insurance Companies of America
Comparison of Empirical Default Rate Relativities and Odds Relativities
Loan Population 5: QRM loans excluding FHA, GT95 CLTV, and GSE
Terminated Loans
Modeled Default Rate: Default_NC



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July 27, 2011

Evaluation of Milliman Client Report, MORTGAGE INSURANCE LOAN PERFORMANCE ANALYSIS AS OF MARCH 31, 2011

I have been retained by the Mortgage Insurance Companies of America (MICA) to provide an evaluation of the Milliman Client Report, MORTGAGE INSURANCE LOAN PERFORMANCE ANALYSIS AS OF MARCH 31, 2011. ("The Report"). My evaluation reflects my best professional judgment and has not been influenced by MICA.

The issue studied in the Report is whether mortgage insurance affects the risk or probability of default of home mortgages, after controlling for factors known to influence default probabilities.

The analysis in the Report is based on the Corelogic mortgage data, as explained in the Report. According to the Report**,** "…Milliman analyzed loan-level data from Corelogic's LoanPerformance Loan Level Servicing Database…" (p. 3. Unless otherwise noted, all page references are from the Report.) The statistical approach did not rely on sampling from the Corelogic data but instead utilized all the data meeting specified filtering criteria. Criteria for defining loans included in the analysis are explained on pages 14 and 15 of the Report. Because the analysis utilized all data satisfying the selected criteria, there are no issues of sampling involved. The filtering employed reflects sound principles to identify all mortgages from the complete universe of Corelogic data that could provide insight into the question being investigated.

The total number of observations after the filtering is over 6 million, a very large number. (See Report Table 2.) This large database permits definition of cells broken down in various ways with an adequate number of observations, in most cases, in the individual cells. Dividing the sample into subsets defined by home price environments (HPA) and LTV is a sound statistical strategy. The effects of these variables are expected to be highly non-linear. The sample size is ample to analyze the segments separately and there is no reason to speculate about or test different assumptions as to non-linearity.

The Report presents the analysis of the total in Table 3. It is instructive to rearrange Table 3 as shown in Table 3a below.

Table 3a is the same as Table 3 in the Report except that it shows the difference instead of the ratio of uninsured to insured default rates. In the worst environment for home price changes—HPA<-20%—the effect of mortgage insurance is substantial. For the various CLTV groups shown in the column headings, the difference in default rates ranges from 12.70% to 37.9%. The Report emphasizes the statistical significance of these differences; what deserves additional emphasis is the economic importance of the differences. Reducing mortgage defaults by these percentages would be highly important to any mortgage portfolio.

As one would expect, the difference in default percentages is relatively small when home prices are rising, as can be seen from the row for 20% < HPA. These differences range from 0.00% to 8.80%. Nevertheless, for CLTV > 95 the difference in losses in the two stronger home

price environments, ranging from 7.10% to 9.00%, are certainly large enough to be economically significant. Indeed, given that we are unlikely to see the weakest home price environment of HPA<=-20% in coming years, estimates of the value of mortgage insurance in reducing defaults for CLTV > 95 in the three stronger home price environments deserve special policy attention,

Table 3a
Population 1 : All Loans
Origination Years 2002-2006

	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	29.00%	30.80%	27.10%	30.40%	33.50%	30.30%
-20%<HPA<=0%	11.90%	12.10%	14.40%	10.90%	10.90%	16.70%
0%<HPA<=20%	5.70%	5.90%	9.50%	5.80%	6.10%	11.70%
20%<HPA	2.70%	3.30%	6.20%	2.70%	3.40%	6.70%
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	45.00%	43.50%	53.10%	53.80%	59.50%	68.20%
-20%<HPA<=0%	19.20%	16.80%	27.90%	19.70%	18.40%	30.90%
0%<HPA<=20%	7.80%	7.10%	18.50%	8.60%	8.00%	18.80%
20%<HPA	3.00%	3.30%	13.80%	3.80%	3.90%	15.50%
HPA Range	**Difference of Uninsured and Insured Default Rates**			**Difference of Uninsured and Insured Default Rates**		
HPA<=-20%	16.00%	12.70%	26.00%	23.40%	26.00%	37.90%
-20%<HPA<=0%	7.30%	4.70%	13.50%	8.80%	7.50%	14.20%
0%<HPA<=20%	2.10%	1.20%	9.00%	2.80%	1.90%	7.10%
20%<HPA	0.30%	0.00%	7.60%	1.10%	0.50%	8.80%

The findings in Table 3a buttress the overall validity of the statistical approach. Reading down each column, the differences fall in stronger home price environments, with one minor exception. At the bottom right of Table 3a, the difference in default rates for the two strongest home price environments for CLTV>95 rises from 7.10% to 8.80%. That difference is small, probably not statistically significant, and certainly not economically significant. These results are consistent with a priori expectation.

The value of mortgage insurance in reducing default rates is greatest in the environment of weak home prices. However, as can be seen from the entries in Table 3a, the advantage of mortgage insurance in reducing default rates is large enough that regulators and portfolio managers should take note. The advantage is especially significant when CLTV>95.

The Report examines subsets of the total data in various ways. Populations 3 and 5 are constructed to be consistent with the proposed definition of a QRM mortgage. The Report presents the analysis of these populations in Tables 5 and 7. Tables 5a and 7a below show differences rather than the ratios shown in the Report.

Table 5a Population 3 : QRM Loans Only Excluding FHA-Insured Loans and Loans with a CLTV Above 95% Origination Years 2002-2006						
	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	17.50%	19.10%	NA	20.10%	21.10%	NA
-20%<HPA<=0%	5.80%	5.50%	NA	4.70%	4.90%	NA
0%<HPA<=20%	1.90%	1.80%	NA	1.70%	1.60%	NA
20%<HPA	0.90%	1.00%	NA	0.90%	1.10%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	16.50%	19.20%	NA	33.40%	40.90%	NA
-20%<HPA<=0%	5.10%	5.90%	NA	6.00%	6.20%	NA
0%<HPA<=20%	1.80%	2.00%	NA	2.80%	2.80%	NA
20%<HPA	0.60%	0.80%	NA	1.30%	1.40%	NA
HPA Range	**Diff Uninsured and Insured Default Rates**			**Diff Uninsured and Insured Default Rates**		
HPA<=-20%	-1.00%	0.10%	NA	13.30%	19.80%	NA
-20%<HPA<=0%	-0.70%	0.40%	NA	1.30%	1.30%	NA
0%<HPA<=20%	-0.10%	0.20%	NA	1.10%	1.20%	NA
20%<HPA	-0.30%	-0.20%	NA	0.40%	0.30%	NA

From Table 5a, it appears that mortgage insurance is not systematically related to lower default rates for terminated and active loans taken together. (Table 5 in the Report shows that the ratios are not statistically significant.) However, for terminated loans only, in the weakest home price environment, there is a substantial effect. As can be seen in the CLTV90 and CLTV95 columns in Table 5a, the differences in the weakest home price environment are 13.30% and 19.80%, respectively. These are large differences and consistent with the hypothesis that mortgage insurance is associated with lower default rates.

From Table 7 in the Report, most of the ratios of default rates uninsured to insured are statistically significant. However, for terminated and active loans taken together the differences in default rates shown in Table 7a below have little economic significance. For terminated loans only, in the weak home price environment of 18.30% and 28.30% are large and deserve the attention of regulators and portfolio managers.

Regression Analysis

As noted in the Report (p.35), 120 models were specified and estimated. The magnitude of the effort exceeded my time to analyze the methods and results in detail. However, the Report makes clear that the results buttress the tables constructed without controls for various underwriting variables. The analysis is impressively thorough.

Table 7a Population 5 : QRM Loans Only Excluding FHA-Insured Loans, Loans with a CLTV Above 95%, and GSE Purchased Loans						
	Terminated and Active Loans			Terminated Loans Only		
	CLTV 90	CLTV 95	CLTV > 95	CLTV 90	CLTV 95	CLTV > 95
HPA Range	**Insured Default Rate**			**Insured Default Rate**		
HPA<=-20%	16.10%	17.20%	NA	12.20%	12.50%	NA
-20%<HPA<=0%	4.70%	4.90%	NA	2.60%	3.40%	NA
0%<HPA<=20%	1.90%	1.80%	NA	1.60%	1.60%	NA
20%<HPA	1.70%	1.60%	NA	1.90%	1.70%	NA
HPA Range	**Uninsured Default Rate**			**Uninsured Default Rate**		
HPA<=-20%	18.00%	25.10%	NA	30.50%	40.80%	NA
-20%<HPA<=0%	5.80%	8.10%	NA	5.70%	7.30%	NA
0%<HPA<=20%	2.20%	2.90%	NA	2.90%	3.50%	NA
20%<HPA	0.60%	1.10%	NA	0.90%	1.40%	NA
HPA Range	**Diff Uninsured and Insured Default Rates**			**Diff Uninsured and Insured Default Rates**		
HPA<=-20%	1.90%	7.90%	NA	18.30%	28.30%	NA
-20%<HPA<=0%	1.10%	3.20%	NA	3.10%	3.90%	NA
0%<HPA<=20%	0.30%	1.10%	NA	1.30%	1.90%	NA
20%<HPA	-1.10%	-0.50%	NA	-1.00%	-0.30%	NA

The regression approach is responsive to concerns expressed by regulators. That said, I am not convinced that this approach is necessary or insightful. Here is the argument.

A mortgage insurance company is in business to make a profit. An MI officer, when presented with applications for insurance, wants to reject applications from borrowers likely to default. More precisely, the default probability should be more than covered by the fees charged so that the company can profit from providing insurance.

Suppose there were a factor X associated with the borrower seeking insurance that was perfectly correlated with default, analogous to a gene associated with disease. When a competent MI officer observes X, she rejects the application. Thus, in the population of insured loans, X is not observed but it is observed in the population of uninsured loans. If a study controls for X, then mortgage insurance adds nothing to observed default experience. But it is precisely because the mortgage insurance company can observe X that the insurance business is profitable and the default experience between insured and non-insured loans differs.

In the context of mortgage insurance, X might be the particular combination of underwriting variables and weights assigned to them, which may differ from one applicant to another. If the regression analysis could perfectly replicate what MI officers do, then the analysis would show that mortgage insurance does not identify borrowers with a higher default probability. The regressions in the Report show that an intensive search to identify what MI officers do is unsuccessful. That is, mortgage insurance does identify mortgages with lower default probability beyond what can be done with powerful statistical methods.

The Report concludes that after allowing for a lengthy list of variables employed in underwriting, the presence of mortgage insurance is associated with lower default rates. However, as I have argued, even if that were not the case the earlier tables indicate that MI officers are successful in identifying, on average, loans with a lower default probability. This observation may be relevant to those suspicious of elaborate econometric models such as those used in the logistic regression analysis in the Report.

Disclaimer

I have not examined the data directly and make no observation concerning the accuracy of the Corelogic data. Nor have I run independent statistical tests to confirm the accuracy of the results presented by Milliman or of the software employed to provide the estimates.

Respectfully submitted,

William Poole

William Poole

William Poole is Senior Fellow at the Cato Institute, Distinguished Scholar in Residence at the University of Delaware, Senior Advisor to Merk Investments and a Special Advisor to Market News International.

Poole retired as President and CEO of the Federal Reserve Bank of St. Louis in March 2008. In that position, which he held from March 1998, he served on the Federal Reserve's main monetary policy body, the Federal Open Market Committee. During his ten years at the St. Louis Fed, he presented over 150 speeches on a wide variety of economic and finance topics.

Before joining the St. Louis Fed, Poole was Herbert H. Goldberger Professor of Economics at Brown University. He served on the Brown faculty from 1974 to 1998 and the faculty of The Johns Hopkins University from 1963 to 1969. Between these two university positions, he was senior economist at the Board of Governors of the Federal Reserve System in Washington. He was a member of the Council of Economic Advisers in the first Reagan administration, from 1982 to 1985.

Poole received his AB degree from Swarthmore College in 1959, and MBA and Ph.D. degrees from the University of Chicago in 1963 and 1966, respectively. Swarthmore honored him with the Doctor of Laws degree in 1989. He was inducted into The Johns Hopkins Society of Scholars in 2005 and presented with the Adam Smith Award by the National Association for Business Economics in 2006. In 2007, the Global Interdependence Center presented him its Frederick Heldring Award.

Poole has engaged in a wide range of professional activities, including publishing numerous papers in professional journals. He has published two books, *Money and the Economy: A Monetarist View*, in 1978, and *Principles of Economics*, in 1991. In 1980-81, he was a visiting economist at the Reserve Bank of Australia and in 1991, Bank Mees and Hope Visiting Professor of Economics at Erasmus University in Rotterdam. At various times, he served on advisory boards of the Federal Reserve Banks of Boston and New York, and the Congressional Budget Office.

Poole appears frequently on the speaking circuit and is well known for his commentary on current economic and financial developments.

Poole was born and raised in Wilmington, Delaware. He has four sons.

Milliman

MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE COHORT CREDIT LOSS ANALYSIS
AS OF SEPTEMBER 2010

Prepared by:
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April 1, 2011

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MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE COHORT CREDIT LOSS ANALYSIS
AS OF MARCH 2010

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MORTGAGE INSURANCE COMPANIES OF AMERICA

MORTGAGE COHORT CREDIT LOSS ANALYSIS
AS OF MARCH 2010

INTRODUCTION AND BACKGROUND

Mortgage Insurance Companies of America (MICA) engaged Milliman to estimate a distribution of the present value of potential credit losses for 15 predefined cohorts of mortgage loans based on historical data as well as the present value of potential credit losses for each cohort over the next three calendar years relative to the fees charged by Freddie Mac and Fannie Mae, collectively the government-sponsored enterprises (GSEs), for the assumed credit risk. The cohorts are defined by the original borrower Fair Isaac Corporation (FICO) score and original loan-to-value ratio (LTV) of the loans; the loan-level underwriting criteria were selected to be similar in underwriting quality to the loans the GSEs are purchasing today. MICA is interested in estimating the cost of credit risk for the 15 predefined cohorts net of mortgage guaranty insurance. This report presents the results of our analysis.

Mortgage guaranty insurance—also known as private mortgage insurance—protects mortgage lenders and investors from potential credit losses stemming from borrower defaults. This credit protection facilitates the sale and transfer of mortgages in the secondary market. Mortgage guaranty insurance is required on loans with an initial LTV ratio greater than 80% for loans securitized by GSEs. Mortgage guaranty insurance typically provides a set coverage amount for a loan that is dependent upon the initial down payment from the borrower. For example, borrowers who obtain a mortgage with a 10% down payment (or equivalently 90% LTV loans) require a private mortgage insurance coverage level of 25%, meaning the private mortgage insurance company will pay the mortgage lender or investor an amount up to 25% of the claim amount, which is calculated as the unpaid principal balance plus approved additional expenses such as accrued interest and foreclosure costs, in the event the borrower defaults on the loan. Any losses in excess of the coverage level will be absorbed by the mortgage lender or investor. For loans securitized by the GSEs, the loss amount in excess of the mortgage insurance coverage is guaranteed by the GSEs, meaning that any losses in excess of the mortgage insurance coverage level are absorbed by

the GSEs and not the investors in the securities issued by the GSEs. In return for this protection, the GSEs charge fees to lenders, in particular a guarantee-fee (G-Fee), loan-level price adjustments (LLPAs), and an adverse market delivery charge (AMDC) fee.

Since early 2008, the GSEs have communicated in Lender Announcement's new credit-risk-based LLPAs on certain loans. The LLPAs are intended to more effectively align pricing on mortgage loans with certain identified risk characteristics. Subsequently, because of the deterioration of market conditions as identified by historically high home price declines and high levels of unsold existing single-family housing inventory, the GSEs took the additional step of introducing an AMDC to manage their credit risks, mitigate losses, and ensure an adequate capital position. The LLPAs are in addition to the traditional G-Fee charge by the GSEs to cover administrative expenses and a portion of the credit risk exposure.

Private mortgage guaranty insurers and the GSEs (collectively "Mortgage Insurers") manage mortgage default risk by diverting accumulated premium revenues derived from 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, Mortgage Insurers achieve diversification by writing business nationally, thereby enabling them to withstand severe regional economic downturns. On the temporal level, private mortgage guaranty insurers are subject to stringent minimum surplus and reserve requirements—including contingency reserve requirements—imposed by state insurance regulators. The contingency reserve requirements generally cause private mortgage guaranty 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 attempt to provide a natural hedge against systematic risk inherent in mortgage guaranty insurance; that is, Mortgage Insurers can reasonably anticipate that sufficient diversification both geographically and temporally will be adequate in protecting the company against an economic downturn.

SCOPE OF ANALYSIS

Milliman has been retained by MICA to independently determine the cost of the credit risk protection provided by the GSEs for 15 LTV/FICO cohorts using publicly available mortgage performance data. The 15 LTV/FICO cohorts Milliman analyzed are presented in the table in Figure 1.

Figure 1: LTV/FICO Cohorts Analyzed

LTV / FICO COHORTS ANALYZED		
85.01 – 90.00% LTV	**90.01 – 95.00% LTV**	**95.01 – 97.00 LTV**
660–679 FICO	660–679 FICO	660–679 FICO
680–699 FICO	680–699 FICO	680–699 FICO
700–719 FICO	700–719 FICO	700–719 FICO
720–739 FICO	720–739 FICO	720–739 FICO
740 + FICO	740 + FICO	740 + FICO

Typically, higher LTV ratios and lower FICO scores indicate a higher level of default risk compared to lower LTV ratios and higher FICO scores.

EXECUTIVE SUMMARY

Mortgage Insurance Companies of America (MICA) engaged Milliman to estimate a distribution of the present value (PV) of potential credit losses for 15 predefined cohorts of mortgage loans based on historical data as well as on the present value of potential credit losses for each cohort over the next three calendar years relative to the fees charged by the GSEs for the assumed credit risk. The cohorts are defined by the original borrower Fair Isaac Corporation (FICO) score and loan-to-value ratio (LTV) of the loans; the loan-level underwriting criteria were selected to be similar in underwriting quality to the loans the GSEs are purchasing today. MICA is interested in estimating the cost of credit risk for the 15 predefined cohorts net of mortgage guaranty insurance (MI) in relation to the additional loan-level price adjustments (LLPAs) and adverse market delivery charges (AMDCs) required by the government-sponsored enterprises (GSEs) Fannie Mae and/or Freddie Mac. The LLPAs used in this analysis refer to the LLPAs published by Fannie Mae effective for loans purchased on or after April 1, 2011, per Fannie Mae's Selling Guide dated December 23, 2010.

Milliman used historical data to estimate distributions for the present value of the loss rate net of mortgage insurance (Loss Rate). The table in Figure 2 presents the results of our analysis using historical data.

FIGURE 2
Difference of Simulated Average Present Value Loss Rate Net of MI and LLPA plus AMDC By Cohort

Cohort			Simulated Average PV of the Loss Rate (Net of MI)	Average LLPA Plus AMDC	Absolute Difference	Percent Difference	LLPA Percentile
LTV	FICO	Coverage	A	B	C = B – A	D = C / A	
85.01-90	660 – 679	25%	1.55%	2.50%	0.95%	61%	75%
85.01-90	680 – 699	25%	1.31%	1.50%	0.19%	14%	68%
85.01-90	700 – 719	25%	1.02%	1.25%	0.23%	22%	70%
85.01-90	720 – 739	25%	0.93%	0.75%	-0.18%	-19%	61%
85.01-90	740+	25%	0.48%	0.50%	0.02%	4%	64%
90.01-95	660 – 679	30%	1.18%	2.50%	1.32%	111%	83%
90.01-95	680 – 699	30%	0.95%	1.50%	0.55%	57%	76%
90.01-95	700 – 719	30%	0.79%	1.25%	0.46%	58%	78%
90.01-95	720 – 739	30%	0.62%	0.75%	0.13%	20%	72%
90.01-95	740+	30%	0.40%	0.50%	0.10%	24%	73%
95.01-97	660 – 679	35%	1.10%	2.00%	0.90%	82%	81%
95.01-97	680 – 699	35%	1.00%	1.25%	0.25%	24%	74%
95.01-97	700 – 719	35%	0.83%	1.25%	0.42%	51%	78%
95.01-97	720 – 739	35%	0.60%	0.75%	0.15%	25%	75%
95.01-97	740+	35%	0.35%	0.50%	0.15%	42%	75%
Arithmetic Average		**30%**	**0.88%**	**1.25%**	**0.37%**	**43%**	**73%**

The table in Figure 2 indicates that the average historical cost of providing insurance on mortgage loans net of private mortgage insurance meeting the loan criteria discussed further in this report using historical loan data from 1998 through 20010 has been 88 basis points; this compares to an average LLPA and AMDC fee of 125 basis points currently charged for the same risk. The current fee is, on average, about 45% greater than the historical cost of insuring the assumed credit risk net of mortgage insurance. Milliman was also asked to provide probability levels related to the expected values presented above. We employed a Monte Carlo simulation technique to derive these levels (this technique is described in greater detail in the Approach to the Analysis section). The 125-basis-point fee corresponds to roughly the 75th percentile of possible outcomes according to Milliman's simulation results. An α-percentile is the value at which α% of the trials resulted in a simulated present value of the loss rate net of mortgage insurance less than the α-percentile loss rate. For example, the 75th percentile Loss Rate for the 95.01-97.00% LTV/740 FICO score cohort was 0.50%; therefore, 75% of the trials (or 7,500 out of the 10,000

trials) resulted in a simulated Loss Rate of less than 0.50%. Equivalently, 25% of the trials (or 2,500 out of the 10,000 trials) resulted in a simulated Loss Rate equal to or above 0.50%.

In Milliman's professional experience the loss rates developed from the data used in this study represent, in general, higher loss rates than an examination of mortgage insurance loss rates over a broader period of time including prior years. The data used to develop the loss rates in Figure 2 covers a period of approximately 12 years with the first observations occurring from loans originated in 1998 and the last observations occurring from loans originated in 2010. The later origination years used in the study correspond to a period of elevated loss rates arising from the current downtrend in home prices and elevated default rates. Therefore, Milliman believes the loss rates cited in Figure 2 correspond to generally conservative average loss rates when viewed against average loss rates developed using a longer period of time. In addition, a distribution of loss rates fit to a broader period of time would likely correspond to a higher LLPA percentile than the 75th percentile cited in Figure 2; once again, Milliman believes the percentiles cited in Figure 2 also represent conservative percentiles. Thus, the LLPA plus AMDC fees represent losses that may be significantly further out in the tail than suggested by this analysis when compared against a longer history of experience.

In addition to estimating distributions for the Loss Rate, Milliman also created baseline estimates of the Loss Rate for prospective book years based on underwriting expectations and home price appreciation forecasts from Moody's Economy.com. The methodology used to develop the frequency of loss for prospective book years is the a priori loss rate discussed in the body of this report. Milliman relied on the historical relationship between loss severity and home price appreciation from origination to claim to estimate the prospective severity of loss for each book year using home price index forecasts from Moody's Economy.com at the national level.

The table in Figure 3 presents the result of our analysis for prospective book years 2011, 2012, and 2013.

FIGURE 3
Difference of Estimated Present Value Loss Rate Net of MI and LLPA Plus AMDC by Cohort for Book Years 2011, 2012, and 2013

Cohort			Average LLPA Plus AMDC (A)	Estimated Prospective Average Present Value of Loss Rate Net of MI (B)			Percent Difference (C) = (A) / (B) - 1		
LTV	FICO	Coverage	LLPA	2011	2012	2013	2011	2012	2013
85.01-90	660 – 679	25%	2.50%	1.32%	0.91%	0.62%	89%	176%	304%
85.01-90	680 – 699	25%	1.50%	0.96%	0.65%	0.43%	56%	132%	247%
85.01-90	700 – 719	25%	1.25%	0.72%	0.48%	0.32%	73%	159%	293%
85.01-90	720 – 739	25%	0.75%	0.54%	0.36%	0.23%	39%	111%	225%
85.01-90	740+	25%	0.50%	0.43%	0.28%	0.18%	17%	77%	175%
90.01-95	660 – 679	30%	2.50%	1.28%	0.85%	0.57%	95%	193%	335%
90.01-95	680 – 699	30%	1.50%	0.95%	0.62%	0.41%	58%	140%	262%
90.01-95	700 – 719	30%	1.25%	0.71%	0.46%	0.30%	77%	172%	319%
90.01-95	720 – 739	30%	0.75%	0.52%	0.33%	0.21%	44%	125%	254%
90.01-95	740+	30%	0.50%	0.39%	0.25%	0.16%	28%	101%	222%
95.01-97	660 – 679	35%	2.00%	1.05%	0.64%	0.40%	90%	213%	405%
95.01-97	680 – 699	35%	1.25%	0.78%	0.47%	0.29%	59%	166%	335%
95.01-97	700 – 719	35%	1.25%	0.58%	0.34%	0.21%	116%	265%	509%
95.01-97	720 – 739	35%	0.75%	0.43%	0.25%	0.15%	74%	198%	406%
95.01-97	740+	35%	0.50%	0.31%	0.18%	0.11%	60%	176%	375%
Arithmetic Average			**1.25%**	**0.73%**	**0.47%**	**0.31%**	**71%**	**165%**	**310%**

As the forecast for the economy is expected to improve, the expected losses to the GSEs are correspondingly expected to subside. As a larger percent of the future losses are expected to be paid by the mortgage insurers at current mortgage insurance coverage levels, the absolute difference between the LLPA and AMDC fees charged by the GSEs and the required cost to insure the credit risk assumed by the GSEs increases.

The table in Figure 3 demonstrates that the prospective expected cost of providing insurance on mortgage loans net of mortgage insurance for loans meeting the loan criteria discussed further in this report is 73 basis points, 47 basis points, and 31 basis points for book years 2011, 2012, and 2013,

respectively. The differences in cost are attributable to the home price appreciation forecasts provided by Moody's Economy.com. The costs above compare to the current arithmetical average LLPA and AMDC fee of 125 basis points. The current fee is, on average, about 70% greater than the expected credit risk assumed on loans insured in 2011, 165% greater than the expected credit risk assumed on loans insured in 2012, and 310% greater than the expected credit risk assumed on loans insured in 2013. The figures cited in this paragraph represent the arithmetical average of each of the 15 predefined cohorts.

Additionally, Milliman calculated the arithmetical average of the difference in LLPA and AMDC fees charged by the GSEs and the required cost to insure the credit risk assumed by the GSEs by FICO score cohort only. By isolating the difference by FICO score cohort, as displayed in the table in Figure 4, the LLPA and AMDC fees appear to have a greater impact on the 660-679 FICO score cohort and the 700-719 FICO score cohort for prospective books relative to the estimated cost to insure the credit risk assumed by the GSEs.

FIGURE 4
Difference of Estimated Present Value Loss Rate Net of MI and LLPA Plus AMDC by FICO Cohort for Book Years 2011, 2012, and 2013

Cohort	Average LLPA plus AMDC (A)	Arithmetical Average by LTV					
		Estimated Prospective Average Present Value of Loss Rate Net of MI (B)			Percent Difference (C) = (A) / (B) - 1		
FICO		2011	2012	2013	2011	2012	2013
660 – 679	2.33%	1.22%	0.80%	0.53%	91%	192%	341%
680 – 699	1.42%	0.90%	0.58%	0.38%	58%	144%	275%
700 – 719	1.25%	0.67%	0.43%	0.27%	87%	192%	356%
720 – 739	0.75%	0.50%	0.31%	0.20%	51%	139%	281%
740+	0.50%	0.38%	0.24%	0.15%	33%	111%	239%
Arithmetical Average	**1.25%**	**0.73%**	**0.47%**	**0.31%**	**71%**	**165%**	**310%**

To assess the impact of increased mortgage insurance coverage levels on the cost of insuring mortgage credit risk net of mortgage insurance, Milliman estimated the Loss Rate for each cohort at varying levels of mortgage insurance coverage using the simulation results. The table in Figure 5 provides a summary of the analysis for each cohort; each cohort in Figure 5 is assigned the same "down-to" mortgage insurance coverage level. The "down-to" coverage level is equal to one minus the coverage amount provided by the mortgage insurance plus the downpayment provided by the borrower at origination. The "down-to" coverage level represents the amount of risk in the mortgage relative to the value of a property. For example a loan with a 15% coverage amount from mortgage insurance and a 5% downpayment would have coverage "down-to" 80% (80% = 100% - 15% - 5%) of the value of the property. The coverage amount typically varies depending on the size of the downpayment from the borrower.

FIGURE 5
Simulated Average Present Value Loss Rate Net of Mortgage Insurance

Cohort		"Down-to" Coverage Level					
LTV	**FICO**	**65%**	**55%**	**45%**	**35%**	**25%**	**15%**
85.01-90	660 – 679	1.55%	0.83%	0.35%	0.13%	0.04%	0.01%
85.01-90	680 – 699	1.31%	0.72%	0.31%	0.12%	0.04%	0.01%
85.01-90	700 – 719	1.02%	0.56%	0.24%	0.09%	0.03%	0.01%
85.01-90	720 – 739	0.93%	0.52%	0.23%	0.09%	0.03%	0.01%
85.01-90	740+	0.48%	0.26%	0.11%	0.04%	0.01%	0.00%
90.01-95	660 – 679	1.18%	0.56%	0.20%	0.06%	0.02%	0.00%
90.01-95	680 – 699	0.95%	0.46%	0.18%	0.06%	0.02%	0.00%
90.01-95	700 – 719	0.79%	0.39%	0.16%	0.05%	0.02%	0.00%
90.01-95	720 – 739	0.62%	0.31%	0.13%	0.04%	0.01%	0.00%
90.01-95	740+	0.40%	0.20%	0.08%	0.03%	0.01%	0.00%
95.01-97	660 – 679	1.10%	0.46%	0.16%	0.05%	0.02%	0.00%
95.01-97	680 – 699	1.00%	0.43%	0.15%	0.05%	0.01%	0.00%
95.01-97	700 – 719	0.83%	0.36%	0.13%	0.04%	0.02%	0.00%
95.01-97	720 – 739	0.60%	0.26%	0.09%	0.03%	0.01%	0.00%
95.01-97	740+	0.35%	0.14%	0.05%	0.01%	0.00%	0.00%
Arithmetic Average		**0.88%**	**0.43%**	**0.17%**	**0.06%**	**0.02%**	**0.01%**

At the current "down-to" coverage level of 65% for each cohort, the average simulated Loss Rate is 0.88%; at increased amounts of mortgage insurance coverage to an average "down-to" coverage level of 35% for each cohort, the average simulated Loss Rate is 0.06%, indicating significantly reduced risk to the GSEs.

On a technical note, Milliman's analysis is based on producing an average frequency and severity of loss at the cohort level where the distributions of the frequency and severity of loss were developed using loan-level data. Milliman's analysis does not take into consideration the possibility of left-truncation for loans with mortgage insurance within a cohort. Milliman calculates the average Loss Rate net of mortgage insurance as follows:

Loss Rate Net of MI = Max [0, Average Frequency * (Average Severity – Coverage Level)]

If the average severity of loss for any given simulation trial is less than the coverage level, the trial is assigned a Loss Rate net of mortgage insurance of 0%. In reality, the severity of loss for a cohort of loans is itself a distribution. Therefore, although the simulated average severity of loss for a cohort of loans may be less than the coverage level, it is probable that a portion of the loans in that cohort may have a severity of loss in excess of the coverage level, thus producing a loss for the cohort. These losses are not accounted for in Milliman's simulation. However, this truncation issue is also applicable to loss severities simulated in excess of the coverage level. In such instances where the average severity of loss for a cohort of loans is greater than the coverage level, it is probable that a portion of the loans in that cohort may have a severity of loss less than the coverage level, thus resulting in no loss to the GSEs and potentially offsetting the impact of the left-truncation discussed above. Milliman believes the impact of truncation is not likely to affect the results of this analysis.

Milliman's analysis exclusively analyzes the LLPAs and AMDCs and does not include the traditional guarantee fee that the GSEs continue to charge. The traditional guarantee fee also covers projected credit losses from borrower defaults over the life of the loans in addition to administrative costs, and a return on capital. The G-Fee averaged about 23 basis points for single-family fixed-rate 30-year mortgage loans between 2007 and 2009 according to a report issued by the Federal Housing Finance Agency, "Fannie Mae and Freddie Mac Single-Family Guarantee Fees in 2008 and 2009." A recent report issued jointly by the Department of the Treasury and the U.S. Department of Housing and Urban Development, "Reforming America's Housing Finance Market," recently recommended that GSEs increase G-Fee pricing to bring private capital back into the mortgage market. Such increases are not considered in this report.

APPROACH TO ANALYSIS

Source of Data

Milliman obtained aggregate cohort performance data by book quarter from Corelogic's LoanPerformance (LPS) databases for mortgage loans with similar underwriting quality to the loans the GSEs are purchasing today; specifically, Milliman used LPS's Loan Level Servicing and Loan Level Subprime Securities databases. The data from the Servicing database contains loss frequency and persistency data for each cohort from calendar years 1998 through 2010 (the last month of observation for this study is November 2010). The data from the Securities database contains loss severity data from calendar year 1996 through 2010 (the last month of observation for this study is also November 2010) with loan originations dating back to as early as 1976. The aggregate data included loans meeting the following characteristics:

Loans included in analysis:

- Back-end debt-to-income ratio equal to or less than 41%, if populated (servicing data only)
- Fixed rate loans or an adjustable-rate mortgage with a reset period greater than or equal to seven years
- Loans with an amortization period equal to or less than 360 months
- Full documentation loans
- Loans flagged as having mortgage insurance (servicing data only)
- Purchase-only loans
- Single-family residence loans
- Loans with an original loan-to-value ratio (LTV) between 80% and 97%
- Loans with a FICO score between 660 and 840
- Loans with an occupancy type of primary residence
- Loans for single-unit property only
- Loans that are flagged as Freddie Mac or Fannie Mae loans (servicing data only)
- First lien loans only (securities data only)

Loans excluded from analysis:

- Alternative or reduced documentation loans
- Loans with a missing FICO score
- Interest-only loans
- Loans with a balloon payment
- Negative amortization loans

For the LPS Servicing database the above filters resulted in 645,509 loans issued between the years 1998 and 2010. The data contains persistency and claim data on a count basis for each cohort as of November 2010; Milliman used this data to create cumulative claim triangles and persistency triangles for each cohort by origination quarter. The LPS Servicing database does not include a claim or loss flag; however, the database does include the historical loan status of each loan. For the purposes of this study, Milliman defined a claim, or equivalently a loss, to occur at the first occurrence of either a foreclosure or real estate owned (REO) status. The data contains loan-level underwriting characteristics and geographic data that Milliman used to develop the loan level a priori loss frequency discussed below.

For the LPS Securities database the above filters resulted in 256,621 loan originations and 23,090 observations with a loss. The LPS Securities data contains loss frequency and loss severity data for loans meeting the above criteria. Milliman used this data to estimate a ground-up severity distribution for the loans as well as to estimate the relationship between loss frequency and loss severity.

Loan Level A Priori Economic Adjusted Loss Frequency

Milliman developed a priori loss frequencies for each loan in the servicing data that conformed to the loan-level characteristics defined above based on in-force data as of November 2010. Milliman recognizes that the economy is changing and certain economic variables can have an impact on loss frequencies. Consequently, Milliman has developed an economic-driven model to estimate loss frequencies, which incorporates specific home price appreciation (HPA) scenarios. The model is

calibrated to determine loss frequencies for a given loan depending on historical and future HPA assumption inputs. Milliman used Moody's Economy.com home price appreciation projection at the core based statistical area (CBSA) level in its model, or at the state level if a CBSA forecast was not available as of December 2010, with actual home price indices as of September 2010.

In order to calculate a priori loss frequencies, Milliman begins with matrices of loss frequencies distributed by LTV ratios and FICO scores at an AAA rating level and a CCC rating level. Weighting between these matrices, we determine a baseline loss frequency for each loan. As a note, the AAA level is a higher standard of losses roughly equivalent to the 99.9% probability level of losses (i.e., there is only a 0.1% likelihood that a cohort's lifetime frequency of foreclosure level will exceed the AAA frequency of foreclosure level assigned). Based on cumulative HPA to-date and the forecasted HPA each quarter up to and including 20 projection quarters, Milliman calculates cumulative HPA from origination through the forecast period for each loan. The forecast is weighted by a Milliman-developed 20-quarter foreclosure lag distribution to develop a weighted average home price appreciation estimate for each loan. The foreclosure lag distribution was developed using proprietary industry loan-level data and represents the timing of foreclosure given the age of a particular loan. In order to allow the baseline loss frequency to reflect the impact of HPA, we calculate the economic adjusted loss frequency for each loan by interpolating between the indicated AAA and CCC loss frequencies.

Loan Level A Priori Underwriting Adjusted Loss Frequency

Loss frequency expectations can vary by loan underwriting characteristics; therefore, adjustments are made to the economic adjusted loss frequency to reflect the impact of various risk factors. The underwriting loss frequency adjustments are derived through a close examination of the loan characteristics for each loan. The underwriting loan characteristics Milliman generally considers in determining loss propensities are: FICO score at origination, loan-to-value ratio at origination (LTV), amortization type (e.g., fixed frequency mortgage with a term of 30 years or adjustable frequency mortgage with an adjustment period after five years), property type, interest-only or option ARM identified,

loan purpose, occupancy type, documentation type, and loan size. Below is a summary of Milliman's view regarding these loan characteristics and their effect on loss frequencies:

- *FICO score*: Borrowers with low FICO scores are deemed to present a greater credit risk, and therefore, a borrower with a low FICO score is assigned a higher loss frequency.

- *LTV*: Mortgages supported by lower collateral investment by the borrower are subject to greater risk of future negative position, which is due to declines in home appreciation or the costs associated with the disposition of a delinquent property. Therefore, higher LTV loans are more likely to default (i.e., higher loss frequency).

- *Amortization*: ARMs are subject to interest rate risk and potential payment fluctuations with the market. Borrowers with a fixed-rate mortgage are locked into an interest frequency and qualify for their mortgage at known debt-to-income ratios. Potentially higher interest rates for ARM borrowers without a proportional increase in income create greater mortgage debt obligations for the borrower and an increased probability of default. Accordingly, Milliman has assigned a greater risk factor for ARMs.

- *Interest-only/option ARMs:* It is believed that borrowers with loans that have payment options such as only paying interest (as opposed to paying principal and interest) may present a greater credit risk; thus, Milliman assigned a greater risk factor to these types of loans.

- *Loan purpose*: Cash-out refinance loans can be indicative of financial stress on the borrower and, therefore, loans of this type are assigned a greater risk factor.

- *Property type:* Loans for 2-4 family homes and condos have exhibited a greater propensity for default based on industry data and are also assigned greater 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 investment property is significantly lower than his or her loyalty to a primary residence. The same relationship holds true for second homes although to a lesser degree. Therefore, Milliman has assigned greater 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 greater 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 greater risk factor.

The underwriting and economic adjusted loss frequency is determined by multiplying the indicated economic loss frequency by the product of the underwriting risk factors. Note that an underwriting risk factor of 1.00 in a given loan characteristic category represents a loan with no more or less risk than our baseline loss frequency assumption (i.e., it is non-influential on the baseline loss frequency). Furthermore, a factor below 1.00 represents a loan with a lower propensity for foreclosure than was indicated by the baseline loss frequency, while a factor above 1.00 represents a loan with more propensity for foreclosure. For example, a loan with a 30-year amortization and a fixed rate would be assigned a factor of 1.00, while a loan with a 15-year amortization and a fixed rate would be assigned a factor less than 1.00. The multiplier determines whether the propensity for foreclosure of each loan is greater or less than the baseline loss frequency.

Once the composite underwriting risk factor adjustment is calculated, it is applied to the indicated economic adjusted loss frequency described above to develop an indicated underwriting and economic adjusted loss frequency.

Ultimate Loss Frequency Selection

After analyzing the loan-level characteristics and selecting a priori loss frequencies, Milliman relied on judgment and a variety of standard actuarial methodologies to select ultimate loss frequencies by book quarter. Ultimate loss frequencies are defined as the ultimate loss count divided by the original number of loans for a given cohort. Three standard actuarial methodologies were considered in calculating ultimate loss frequency indications.

The first methodology considered is the paid loss development factor (LDF) method. As a group of loans age, their collective loss count changes. Their collective loss frequency similarly changes. This change in value over time is referred to as loss development. The LDF method is a traditional actuarial approach that relies on the historical changes in losses from one evaluation point to another to project the current loss frequency to an ultimate loss frequency. 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 loss frequencies through the fourth quarter of 2010. Milliman used the LPS servicing cohort performance data to develop the loss development pattern. Milliman defined a loss as the first observance of the loan status being either foreclosure or REO.

In addition to the paid LDF method, Milliman also used the unadjusted and adjusted paid Bornhuetter-Ferguson (B-F) method to project ultimate loss frequencies. These methods are commonly used to provide a more stable estimate of ultimate loss frequencies in situations where loss development is volatile, substantial, and/or immature. The B-F method calculates an indicated unpaid loss frequency. The indicated unpaid loss frequency is calculated directly as the product of the selected a priori ultimate

loss frequency (selected based on loan characteristics of the loans and the economic risk adjustments discussed above) and an unpaid factor. The unpaid factor is derived from the LDF selection described in the paid LDF method. The estimated unpaid loss frequency is added to the paid loss frequency to date to derive an estimated ultimate loss frequency.

The third ultimate loss frequency methodology used by Milliman is the adjusted paid B-F method. The adjusted paid B-F method is identical to the unadjusted B-F method with the exception of an adjustment to the a priori ultimate loss frequency. The a priori ultimate loss frequency used in the adjusted B-F method is derived from the selected a priori ultimate loss frequency, 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 frequencies. The actual persistency is equal to the number of loans in force for a given book quarter divided by the total number of loans written for a given book quarter. The average historical persistency, also known as the a priori cumulative persistency, is calculated by Milliman using PSAs that vary by cohort. The PSAs were selected by examining historical runoff triangles and selecting a long-term average persistency frequency for each cohort. After applying the adjustment factor to the a priori ultimate loss frequency, the unadjusted and adjusted B-F methods are identical.

After considering each of the ultimate loss frequency indications for each cohort, Milliman made ultimate loss frequency selections by book quarter where data was available.

Loss Frequency Distribution

Milliman created probability distributions of the ultimate loss frequency for each cohort using a mixed distribution. The mixed distribution used to fit the probability distributions of the ultimate loss frequency by cohort is a mixture of a gamma distribution and a lognormal distribution. The lognormal distribution is used to fit the ultimate loss frequencies during "normal" economic conditions with increasing home prices and ample credit availability, and the gamma distribution is used to fit the ultimate loss frequencies in the

tail of the distribution depicting more extreme loss events. Milliman fit the distributions using a maximum likelihood technique.

Loss Severity Distribution

Milliman relied on the LPS securities data to develop a probability distribution for loss severity. Using the loss amount field in the securities data Milliman calculated loan-level loss severities. Milliman aggregated the loan-level severity data by origination quarter and cohort and fit distributions to the observations. Milliman expected that loans with higher original LTVs would result in higher loss severities and that loans with lower original LTVs would result in lower loss severities. However, Milliman's probability distributions resulted in counterintuitive results by cohort where higher LTV cohorts were associated with equal or lower loss severities across all LTV cohorts. Milliman conducted a univariate regression on both the original FICO score and original LTV buckets against historical severity data; the results indicated that FICO score and original LTV do not have a large predictive power when estimating severity as measured by the R-square of the regression.

Given this observation, Milliman created a single distribution of severity for all cohorts using a logistic distribution fit to historical severity data by origination quarter. Milliman fit the distributions using a maximum likelihood technique. Milliman limited the origination quarter observations to origination quarters with at least 10 loss observations in order to reduce noise in the data resulting from a single loss in any given quarter. The final dataset of severity observations contained 59 origination quarters with an average severity of 36.9%. The average severity rate of the logistic distribution is 37.6%.

Simulation Methodology

Milliman ran a Monte Carlo simulation of 10,000 trials for each cohort using the mixed distributions described above to simulate the ultimate loss frequency and the logistic distribution described above to simulate the severity of loss. Milliman used a Gumbel copula to model the relationship between loss frequency and loss severity.

A Gumbel copula allows for an increasing degree of dependency between the loss frequency and loss severity dependent upon the simulated percentile of the loss frequency; this property is known as tail dependency. For simulated loss frequencies in the lower percentile of the loss frequency distribution the relationship between loss frequency and loss severity is weak, meaning that a low simulated loss frequency can be accompanied by any percentile of severity. For simulated loss frequencies in higher percentiles of the loss frequency distribution the relationship between loss frequency and loss severity is strong, meaning that a high simulated loss frequency is typically accompanied by a similarly high simulated loss severity. The parameter characterizing the Gumbel copula is Theta. Milliman calibrated Theta using historical loss frequency and loss severity from the LPS securities data for the loans identified in the data section of this report on an origination quarter basis for quarters that had at least 10 loan losses from origination through November 2010.

Milliman used the loss frequency and severity distributions to simulate the present value of the ultimate loss rate net of mortgage insurance for each cohort where the ultimate loss rate is equal to the product of the simulated loss frequency and the simulated loss severity net of mortgage insurance. To account for mortgage insurance Milliman reduced the simulated ground-up severity by the coverage amount of the mortgage insurance; if the simulated severity was less than the coverage amount, Milliman assumed a 0% loss rate for the trial.

Loss development patterns were developed by Milliman at the cohort level on a quarterly basis to account for the timing of losses. Using these loss development patterns, Milliman calculated the simulated present value of loss for each trial as the product of the simulated loss frequency, loss severity, and a present value factor. The present value factor was developed using the loss development patterns and the Treasury yield curve as of February 4, 2010. The average present value factor for all cohorts was 0.85.

Simulation Results

The table in Figure 6 presents the results of our analysis. The LLPAs used in this analysis refer to the LLPAs published by Fannie Mae effective for loans purchased on or after April 1, 2011, per Fannie Mae's Selling Guide dated December 23, 2010.

Figure 6: Difference of Simulated Average Present Value Loss Rate Net of MI and LLPA Plus AMDC by Cohort

Cohort			Simulated Average PV of the Loss Rate (Net of MI)	Average LLPA Plus AMDC	Absolute Difference	Percent Difference	LLPA Percentile
LTV	FICO	Coverage	A	B	C = B – A	D = C / A	
85.01-90	660 – 679	25%	1.55%	2.50%	0.95%	61%	75%
85.01-90	680 – 699	25%	1.31%	1.50%	0.19%	14%	68%
85.01-90	700 – 719	25%	1.02%	1.25%	0.23%	22%	70%
85.01-90	720 – 739	25%	0.93%	0.75%	-0.18%	-19%	61%
85.01-90	740+	25%	0.48%	0.50%	0.02%	4%	64%
90.01-95	660 – 679	30%	1.18%	2.50%	1.32%	111%	83%
90.01-95	680 – 699	30%	0.95%	1.50%	0.55%	57%	76%
90.01-95	700 – 719	30%	0.79%	1.25%	0.46%	58%	78%
90.01-95	720 – 739	30%	0.62%	0.75%	0.13%	20%	72%
90.01-95	740+	30%	0.40%	0.50%	0.10%	24%	73%
95.01-97	660 – 679	35%	1.10%	2.00%	0.90%	82%	81%
95.01-97	680 – 699	35%	1.00%	1.25%	0.25%	24%	74%
95.01-97	700 – 719	35%	0.83%	1.25%	0.42%	51%	78%
95.01-97	720 – 739	35%	0.60%	0.75%	0.15%	25%	75%
95.01-97	740+	35%	0.35%	0.50%	0.15%	42%	75%
Arithmetical Average		**30%**	**0.88%**	**1.25%**	**0.37%**	**43%**	**73%**

The summary table in Figure 6 indicates that the average historical cost of providing insurance on mortgage loans net of private mortgage insurance meeting the loan criteria discussed further in this report has been 88 basis points; this compares to an average LLPA and AMDC fee of 125 basis points currently being charged for the same risk. The current fee is, on average, about 45% greater than the historical cost of insuring the assumed credit risk net of mortgage insurance. The 125-basis-point fee corresponds to roughly the 75th percentile of possible outcomes according to Milliman's simulation results. An α-percentile is the value at which α% of the trials resulted in a simulated present value of the loss rate net of

mortgage insurance (Loss Rate) less than the α-percentile loss rate. For example, the 75th percentile Loss Rate for the 95.01-97.00% LTV/740 FICO score cohort was 0.50%; therefore, 75% of the trials (or 7,500 out of the 10,000 trials) resulted in a simulated Loss Rate of less than 0.50%. Equivalently, 25% of the trials (or 2,500 out of the 10,000 trials) resulted in a simulated Loss Rate equal to or above 0.50%.

In Milliman's professional experience the loss rates developed from the data used in this study represent, in general, higher loss rates than an examination of mortgage insurance loss rates over a broader period of time including prior years. The data used to develop the loss rates in Figure 6 covers a period of approximately 12 years with the first observations occurring from loans originated in 1998 and the last observations occurring from loans originated in 2010. The later origination years used in the study correspond to a period of elevated loss rates arising from the current downtrend in home prices and elevated default rates. Therefore, Milliman believes the loss rates cited in Figure 6 correspond to generally conservative average loss rates when viewed against average loss rates developed using a longer period of time. In addition, a distribution of loss rates fit to a broader period of time would likely correspond to a higher LLPA percentile than the 75^{th} percentile cited in Figure 6; once again, Milliman believes the percentiles cited in Figure 6 also represent conservative percentiles. Thus, the LLPA plus AMDC fees represent losses that may be significantly further out in the tail than suggested by this analysis when compared against a longer history of experience.

The simulated average present value of the loss rate net of mortgage insurance is equal to the average of the product of the simulated frequency of loss and the severity of loss less the coverage level for mortgage insurance for all trials. For example, for a given trial, if the simulated frequency of loss is 10% and the simulated severity of loss is 75% with a 25% coverage level, then the simulated Loss Rate net of mortgage insurance is equal to 5% = 10% * (75% - 25%). The simulated Loss Rate is then multiplied by a present value factor based on the cohort's historical loss development experience to arrive at a present value of the simulated loss rate net of mortgage insurance for each trial. Exhibit 1 provides the detailed derivation of the average simulation result for each cohort. The cohort's total LLPA is equal to the LLPA

charge based on the FICO score and loan-to-value (LTV) ratio of the loan plus the 25 basis point adverse market delivery charge (AMDC). The LLPA percentile is the percentile of the total LLPA for each cohort based on Milliman's simulation results. Exhibit 2 shows the percentile distribution of the simulated Loss Rate for each cohort.

Milliman's analysis is based on producing an average frequency and severity of loss at the cohort level where the distributions of the frequency and severity of loss were developed using loan-level data. Milliman's analysis does not take into consideration the possibility of left-truncation for loans with mortgage insurance within a cohort. Milliman calculates the average loss rate net of mortgage insurance as follows:

Loss Rate Net of MI = Max[0, Average Frequency * (Average Severity – Coverage Level)]

If the average severity of loss for any given simulation trial is less than the coverage level, the trial is assigned a Loss Rate net of mortgage insurnace of 0%. In reality, the severity of loss for a cohort of loans is itself a distribution. Therefore, although the simulated average severity of loss for a cohort of loans may be less than the coverage level, it is probable that a portion of the loans in that cohort may have a severity of loss in excess of the coverage level, thus producing a loss for the cohort. These losses are not accounted for in Milliman's simulation. However, this truncation issue is also applicable to loss severities simulated in excess of the coverage level. In such instances where the average severity of loss for a cohort of loans is greater than the coverage level, it is probable that a portion of the loans in that cohort may have a severity of loss less than the coverage level, thus resulting in no loss to the GSEs and potentially offsetting the impact of the left-truncation discussed above. Milliman believes the impact of truncation is not likely to affect the results of this analysis.

Prospective Book Years

In addition to estimating probability distributions of the Loss Rate for each cohort, Milliman also created baseline estimates of the Loss Rate for prospective book years based on underwriting expectations and home price appreciation forecasts from Moody's Economy.com. The results of this analysis are shown in Exhibits 3-5 for the 2011 book years, 2012 book years, and 2013 book years, respectively. Milliman estimated the prospective severity using the historical relationship between loss severity and the average home price appreciation from origination to the time of a claim. For the prospective 2011 book year, Milliman's analysis indicates that the current total LLPA fee structure results in average total LLPA fees about 70% greater than the forecasted cost of the assumed credit risk. The cohort's total LLPA is equal to the LLPA charge based on the FICO score and loan-to-value (LTV) ratio of the loan plus the 25-basis-point adverse market delivery charge. For the prospective 2012 book year, Milliman's analysis indicates that the current total LLPA fee structure results in average total LLPAs fees about 165% greater than the forecasted actual cost of the assumed credit risk. Finally, for the prospective 2013 book year, Milliman's analysis indicates that the current total LLPA fee structure results in average total LLPAs fees about 310% greater than the forecasted actual cost of the assumed credit risk.

Impact of Increased Mortgage Insurance Coverage Levels

Milliman estimated the Loss Rate for each cohort at varying levels of mortgage insurance coverage for each cohort to assess the impact of increased mortgage insurance coverage levels on the cost of insuring mortgage credit risk net of private mortgage insurance. Milliman did not adjust the cost of the mortgage credit risk for the assumed risk by the GSEs for the possible default of private mortgage insurance companies.

As the amount of mortgage insurance coverage increases, the cost of credit risk assumed by the GSEs correspondingly decreases. Exhibit 6 provides the results of the analysis in table format, and Exhibit 7 graphically illustrates the impact that increased mortgage insurance coverage levels have on the cost of credit risk in excess of the mortgage insurance coverage level, using the arithmetical average of all 15

cohorts. Each cohort in Exhibits 6 and 7 are assigned the same "down-to" mortgage insurance coverage level. The "down-to" coverage level is equal to one minus the coverage amount provided by the mortgage insurance plus the downpayment provided by the borrower at origination. The "down-to" coverage level represents the amount of risk in the mortgage relative to the value of a property. For example a loan with a 15% coverage amount from mortgage insurance and a 5% downpayment would have coverage "down-to" 80% (80% = 100% - 15% - 5%) of the value of the property. The coverage amount typically varies depending on the size of the downpayment from the borrower.

As the average amount of private mortgage insurance increases from the current "down-to" coverage level of 65% for each cohort, the average simulated cost of mortgage credit risk assumed by the GSEs declines from 0.88% to an average cost of 0.43% at a "down-to" coverage level of 55% and an average cost of 0.17% at a "down-to" coverage level of 45%. The source of the large decline in the mortgage credit risk cost to the GSEs at higher coverage levels is primarily due to the shape of the loss severity distribution.

The best-fit distribution of severity is a logistic distribution with a mean severity of 37.6% and a standard deviation of 13.1% using maximum likelihood estimation to fit the parameters. As the coverage level starts to exceed the mean severity, the cost of the mortgage credit risk in excess of the coverage level begins to decline as the credit risk cost is defined as:

Loss Rate Net of MI = Max[0, Average Frequency * (Average Severity – Coverage Level)]

As the coverage level increases, a larger portion of the observations will result in a zero loss to the GSEs. In addition, the distribution of loss frequency is positively skewed meaning the majority of the observations result in low loss frequencies with a smaller portion of the observations resulting in large loss frequencies. The combination of low loss severities to the GSEs and the skewed distribution of loss frequencies results in relatively low simulated average costs of mortgage credit risk to the GSEs at increased coverage levels.

QUALIFICATIONS, LIMITATIONS AND DISCLOSURES

In performing this analysis, we have relied on data and other information available to us through Corelogic's LoanPerformance databases. 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.

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 affecting the mortgage business are examples.

A simulation model illustrates the projected impact of actual results varying from projected results that are due to estimated variability inherent in the mortgage process. This variability is referred to as process risk. Our simulation does not reflect the variation of actual results from projections that are 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. Other risks—including but not limited to operational, asset, liquidity, legal, regulatory, and strategic risks—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 future mortgage performance. The unsettled economic environment may worsen, causing more future claims than currently forecasted. Potentially offsetting the economic factors are government-led initiatives that could have a stabilizing impact on the key variables typically driving the level of future 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 that 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 potential credit risk losses on 15 predefined LTV/FICO score cohorts. Performance data used in our analysis was evaluated as of November 30, 2010.

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 the Mortgage Insurance Companies of America (MICA).

Scope

Our estimates of each cohort's potential amount of credit risk losses under this analysis are characterized as statistically-defined estimates (mean, median, nth percentile) and Monte Carlo simulation distributions.

Our estimates are on a discounted basis with respect to the time value of money.

LIMITED DISTRIBUTION OF RESULTS

Milliman's work is prepared solely for the benefit of the Mortgage Insurance Companies of America. 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. The Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America subject to Milliman's prior review and approval, which shall not be unreasonably withheld or delayed. The Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America upon mutual agreement of the Mortgage Insurance Companies of America 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 the Mortgage Insurance Companies of America in connection with any offering, prospectus, securities filing, or solicitation of investment. Professional reviewers engaged by the Mortgage Insurance Companies of America 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.

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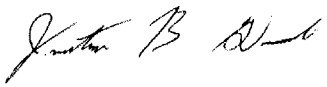
If you should have any questions with regard to this analysis or would like to have us consider additional information, please do not hesitate to contact us. We appreciate the opportunity to work with the Mortgage Insurance Companies of America on this assignment.

Respectfully submitted,

Kenneth A. Bjurstrom
Principal and Financial Consultant



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

KAB/JBG/sbs

April 1, 2011

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Mortgage Insurance Companies of America
Summary of Simulation Results
Average of All Simulation Trials
Gumbel Copula used to Model the Loss Frequency and Loss Severity Dependency

	Frequency	Severity	Simulated Loss Rate Net of MI	Present Value Factor	Simulated PV Loss Rate	LLPA	AMDC Charge	Cohort's Total LLPA	Absolute Difference	Percent Difference	Corresponding LLPA Percentile
			A	B	C = A * B	D	E	F = D + E	G = F - C	H = G / C	
Cohort: 85.01-90 LTV, 660-679 FICO	10.1%	37.7%	1.8%	86.1%	1.55%	2.25%	0.25%	2.50%	0.95%	61%	75%
Cohort: 85.01-90 LTV, 680-699 FICO	8.5%	37.6%	1.6%	84.3%	1.31%	1.25%	0.25%	1.50%	0.19%	14%	68%
Cohort: 85.01-90 LTV, 700-719 FICO	6.6%	37.6%	1.2%	84.4%	1.02%	1.00%	0.25%	1.25%	0.23%	22%	70%
Cohort: 85.01-90 LTV, 720-739 FICO	5.8%	37.6%	1.1%	82.6%	0.93%	0.50%	0.25%	0.75%	-0.18%	-19%	61%
Cohort: 85.01-90 LTV, 740 FICO	3.1%	37.4%	0.6%	83.9%	0.48%	0.25%	0.25%	0.50%	0.02%	4%	64%
Cohort: 90.01-95 LTV, 660-679 FICO	10.6%	37.7%	1.4%	85.7%	1.18%	2.25%	0.25%	2.50%	1.32%	111%	83%
Cohort: 90.01-95 LTV, 680-699 FICO	8.4%	37.6%	1.1%	85.2%	0.95%	1.25%	0.25%	1.50%	0.55%	57%	76%
Cohort: 90.01-95 LTV, 700-719 FICO	6.7%	37.5%	0.9%	85.3%	0.79%	1.00%	0.25%	1.25%	0.46%	58%	78%
Cohort: 90.01-95 LTV, 720-739 FICO	5.1%	37.6%	0.7%	84.6%	0.62%	0.50%	0.25%	0.75%	0.13%	20%	72%
Cohort: 90.01-95 LTV, 740 FICO	3.3%	37.6%	0.5%	83.8%	0.40%	0.25%	0.25%	0.50%	0.10%	24%	73%
Cohort: 95.01-97 LTV, 660-679 FICO	13.9%	37.5%	1.3%	87.2%	1.10%	1.75%	0.25%	2.00%	0.90%	82%	81%
Cohort: 95.01-97 LTV, 680-699 FICO	12.1%	37.7%	1.2%	86.4%	1.00%	1.00%	0.25%	1.25%	0.25%	24%	74%
Cohort: 95.01-97 LTV, 700-719 FICO	9.6%	37.8%	1.0%	86.4%	0.83%	1.00%	0.25%	1.25%	0.42%	51%	78%
Cohort: 95.01-97 LTV, 720-739 FICO	7.0%	37.7%	0.7%	86.6%	0.60%	0.50%	0.25%	0.75%	0.15%	25%	75%
Cohort: 95.01-97 LTV, 740 FICO	4.6%	37.7%	0.4%	83.0%	0.35%	0.25%	0.25%	0.50%	0.15%	42%	75%
Arithmetic Average	7.68%	37.61%	1.03%	85.06%	0.88%	1.00%	0.25%	1.25%	0.37%	43%	73%

Mortgage Insurance Companies of America
Summary of Simulation Results
Simulated Present Value of the Ultimate Loss Rate Net of Mortgage Insurance Percentiles
Gumbel Copula Approach

	10	20	30	40	50	60	70	80	90	99
Cohort: 85.01-90 LTV, 660-679 FICO	0.0%	0.1%	0.4%	0.6%	1.0%	1.5%	2.1%	2.9%	4.5%	11.3%
Cohort: 85.01-90 LTV, 680-699 FICO	0.0%	0.1%	0.3%	0.4%	0.7%	1.1%	1.6%	2.4%	4.0%	11.6%
Cohort: 85.01-90 LTV, 700-719 FICO	0.0%	0.1%	0.2%	0.3%	0.5%	0.8%	1.3%	1.9%	3.2%	8.8%
Cohort: 85.01-90 LTV, 720-739 FICO	0.0%	0.0%	0.1%	0.2%	0.4%	0.7%	1.1%	1.7%	3.0%	8.7%
Cohort: 85.01-90 LTV, 740 FICO	0.0%	0.0%	0.1%	0.1%	0.2%	0.4%	0.6%	0.9%	1.5%	4.2%
Cohort: 90.01-95 LTV, 660-679 FICO	0.0%	0.0%	0.1%	0.3%	0.6%	0.9%	1.4%	2.2%	3.7%	10.1%
Cohort: 90.01-95 LTV, 680-699 FICO	0.0%	0.0%	0.1%	0.2%	0.4%	0.7%	1.2%	1.8%	3.0%	8.9%
Cohort: 90.01-95 LTV, 700-719 FICO	0.0%	0.0%	0.0%	0.2%	0.3%	0.5%	0.9%	1.4%	2.5%	7.8%
Cohort: 90.01-95 LTV, 720-739 FICO	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%	0.7%	1.1%	2.0%	6.6%
Cohort: 90.01-95 LTV, 740 FICO	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.4%	0.7%	1.3%	4.4%
Cohort: 95.01-97 LTV, 660-679 FICO	0.0%	0.0%	0.0%	0.0%	0.3%	0.6%	1.1%	1.9%	3.6%	11.6%
Cohort: 95.01-97 LTV, 680-699 FICO	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	1.0%	1.8%	3.4%	10.9%
Cohort: 95.01-97 LTV, 700-719 FICO	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.8%	1.4%	2.8%	9.1%
Cohort: 95.01-97 LTV, 720-739 FICO	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.6%	1.0%	2.0%	6.9%
Cohort: 95.01-97 LTV, 740 FICO	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%	0.7%	1.3%	3.8%
Arithmetic Average	0.0%	0.0%	0.1%	0.2%	0.4%	0.6%	1.0%	1.6%	2.8%	8.3%

Mortgage Insurance Companies of America
Summary of Estimated Present Value of Loss Rate Net of Mortgage Insurance
Using a 2011 Prospective Book

	2011 Average Estimated Frequency*	Estimated HPA After 6 Years	2011 Average Estimated Severity**	MI Coverage	2011 Average Estimated Loss Rate Net of MI	Present Value Factor	Estimated PV Loss Rate	LLPA	AMDC Charge	Cohort's Total LLPA	Absolute Difference	Percent Difference
	A	B	C	D	E = Max(0,A*(C-D))	F	G = E * F	H	I	J = H + I	K = J - G	L = K / G
Cohort: 85.01-90 LTV, 660-679 FICO	8.9%	17.1%	42.4%	25%	1.5%	86.1%	1.32%	2.25%	0.25%	2.50%	1.18%	89%
Cohort: 85.01-90 LTV, 680-699 FICO	6.6%	17.1%	42.4%	25%	1.1%	84.3%	0.96%	1.25%	0.25%	1.50%	0.54%	56%
Cohort: 85.01-90 LTV, 700-719 FICO	4.9%	17.1%	42.4%	25%	0.9%	84.4%	0.72%	1.00%	0.25%	1.25%	0.53%	73%
Cohort: 85.01-90 LTV, 720-739 FICO	3.8%	17.1%	42.4%	25%	0.7%	82.6%	0.54%	0.50%	0.25%	0.75%	0.21%	39%
Cohort: 85.01-90 LTV, 740 FICO	2.9%	17.1%	42.4%	25%	0.5%	83.9%	0.43%	0.25%	0.25%	0.50%	0.07%	17%
Cohort: 90.01-95 LTV, 660-679 FICO	12.1%	17.1%	42.4%	30%	1.5%	85.7%	1.28%	2.25%	0.25%	2.50%	1.22%	95%
Cohort: 90.01-95 LTV, 680-699 FICO	9.0%	17.1%	42.4%	30%	1.1%	85.2%	0.95%	1.25%	0.25%	1.50%	0.55%	58%
Cohort: 90.01-95 LTV, 700-719 FICO	6.7%	17.1%	42.4%	30%	0.8%	85.3%	0.71%	1.00%	0.25%	1.25%	0.54%	77%
Cohort: 90.01-95 LTV, 720-739 FICO	5.0%	17.1%	42.4%	30%	0.6%	84.6%	0.52%	0.50%	0.25%	0.75%	0.23%	44%
Cohort: 90.01-95 LTV, 740 FICO	3.8%	17.1%	42.4%	30%	0.5%	83.8%	0.39%	0.25%	0.25%	0.50%	0.11%	28%
Cohort: 95.01-97 LTV, 660-679 FICO	16.4%	17.1%	42.4%	35%	1.2%	87.2%	1.05%	1.75%	0.25%	2.00%	0.95%	90%
Cohort: 95.01-97 LTV, 680-699 FICO	12.3%	17.1%	42.4%	35%	0.9%	86.4%	0.78%	1.00%	0.25%	1.25%	0.47%	59%
Cohort: 95.01-97 LTV, 700-719 FICO	9.1%	17.1%	42.4%	35%	0.7%	86.4%	0.58%	1.00%	0.25%	1.25%	0.67%	116%
Cohort: 95.01-97 LTV, 720-739 FICO	6.8%	17.1%	42.4%	35%	0.5%	86.6%	0.43%	0.50%	0.25%	0.75%	0.32%	74%
Cohort: 95.01-97 LTV, 740 FICO	5.1%	17.1%	42.4%	35%	0.4%	83.0%	0.31%	0.25%	0.25%	0.50%	0.19%	60%
Arithmetic Average	7.56%	17.13%	42.35%		0.86%	85.06%	0.73%	1.00%	0.25%	1.25%	0.52%	71%

*Based on cumulative HPA growth of 2.33% over the next two years using Moody's Economy.com National Average Forecasts
**Estimated Mean Severity = -0.3457 x ln(Cum. HPA) + 0.4782

Mortgage Insurance Companies of America
Summary of Estimated Present Value of Loss Rate Net of Mortgage Insurance
Using a 2012 Prospective Book

	2012 Average Estimated Frequency*	Estimated HPA After 6 Years	2012 Average Estimated Severity**	MI Coverage	2012 Average Estimated Loss Rate Net of MI	Present Value Factor	Estimated PV Loss Rate	LLPA	AMDC Charge	Cohort's Total LLPA	Absolute Difference	Percent Difference
	A	B	C	D	E = Max(0,A*(C-D))	F	G = E * F	H	I	J = H + I	K = J - G	L = K / G
Cohort: 85.01-90 LTV, 660-679 FICO	6.7%	22.6%	40.8%	25%	1.1%	86.1%	0.91%	2.25%	0.25%	2.50%	1.59%	176%
Cohort: 85.01-90 LTV, 680-699 FICO	4.9%	22.6%	40.8%	25%	0.8%	84.3%	0.65%	1.25%	0.25%	1.50%	0.85%	132%
Cohort: 85.01-90 LTV, 700-719 FICO	3.6%	22.6%	40.8%	25%	0.6%	84.4%	0.48%	1.00%	0.25%	1.25%	0.77%	159%
Cohort: 85.01-90 LTV, 720-739 FICO	2.7%	22.6%	40.8%	25%	0.4%	82.6%	0.36%	0.50%	0.25%	0.75%	0.39%	111%
Cohort: 85.01-90 LTV, 740 FICO	2.1%	22.6%	40.8%	25%	0.3%	83.9%	0.28%	0.25%	0.25%	0.50%	0.22%	77%
Cohort: 90.01-95 LTV, 660-679 FICO	9.2%	22.6%	40.8%	30%	1.0%	85.7%	0.85%	2.25%	0.25%	2.50%	1.65%	193%
Cohort: 90.01-95 LTV, 680-699 FICO	6.8%	22.6%	40.8%	30%	0.7%	85.2%	0.62%	1.25%	0.25%	1.50%	0.88%	140%
Cohort: 90.01-95 LTV, 700-719 FICO	5.0%	22.6%	40.8%	30%	0.5%	85.3%	0.46%	1.00%	0.25%	1.25%	0.79%	172%
Cohort: 90.01-95 LTV, 720-739 FICO	3.7%	22.6%	40.8%	30%	0.4%	84.6%	0.33%	0.50%	0.25%	0.75%	0.42%	125%
Cohort: 90.01-95 LTV, 740 FICO	2.7%	22.6%	40.8%	30%	0.3%	83.8%	0.25%	0.25%	0.25%	0.50%	0.25%	101%
Cohort: 95.01-97 LTV, 660-679 FICO	12.7%	22.6%	40.8%	35%	0.7%	87.2%	0.64%	1.75%	0.25%	2.00%	1.36%	213%
Cohort: 95.01-97 LTV, 680-699 FICO	9.4%	22.6%	40.8%	35%	0.5%	86.4%	0.47%	1.00%	0.25%	1.25%	0.78%	166%
Cohort: 95.01-97 LTV, 700-719 FICO	6.9%	22.6%	40.8%	35%	0.4%	86.4%	0.34%	1.00%	0.25%	1.25%	0.91%	265%
Cohort: 95.01-97 LTV, 720-739 FICO	5.0%	22.6%	40.8%	35%	0.3%	86.6%	0.25%	0.50%	0.25%	0.75%	0.50%	198%
Cohort: 95.01-97 LTV, 740 FICO	3.8%	22.6%	40.8%	35%	0.2%	83.0%	0.18%	0.25%	0.25%	0.50%	0.32%	176%
Arithmetic Average	5.68%	22.57%	40.78%		0.55%	85.06%	0.47%	1.00%	0.25%	1.25%	0.78%	165%

*Based on cumulative HPA growth of 6.87% over 2012-2014 using Moody's Economy.com National Average Forecasts
**Estimated Mean Severity = -0.3457 x ln(Cum. HPA) + 0.4782

Mortgage Insurance Companies of America
Summary of Estimated Present Value of Loss Rate Net of Mortgage Insurance
Using a 2013 Prospective Book

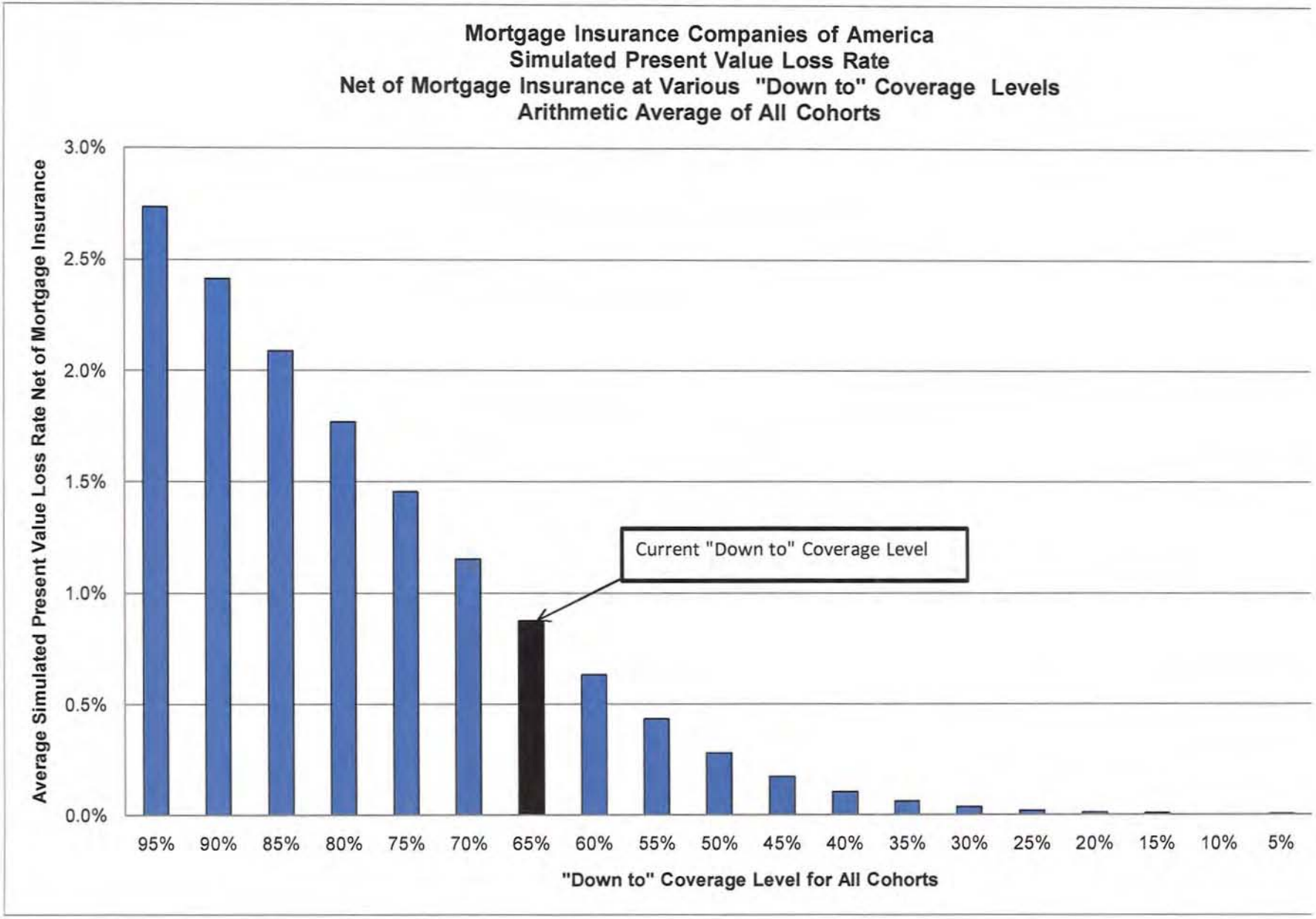
	2013 Average Estimated Frequency*	Estimated HPA After 6 Years	2013 Average Estimated Severity**	MI Coverage	2013 Average Estimated Loss Rate Net of MI	Present Value Factor	Estimated PV Loss Rate	LLPA	AMDC Charge	Cohort's Total LLPA	Absolute Difference	Percent Difference
	A	B	C	D	E = Max(0,A*(C-D))	F	G = E * F	H	I	J = H + I	K = J - G	L = K / G
Cohort: 85.01-90 LTV, 660-679 FICO	4.9%	26.3%	39.7%	25%	0.7%	86.1%	0.62%	2.25%	0.25%	2.50%	1.88%	304%
Cohort: 85.01-90 LTV, 680-699 FICO	3.5%	26.3%	39.7%	25%	0.5%	84.3%	0.43%	1.25%	0.25%	1.50%	1.07%	247%
Cohort: 85.01-90 LTV, 700-719 FICO	2.6%	26.3%	39.7%	25%	0.4%	84.4%	0.32%	1.00%	0.25%	1.25%	0.93%	293%
Cohort: 85.01-90 LTV, 720-739 FICO	1.9%	26.3%	39.7%	25%	0.3%	82.6%	0.23%	0.50%	0.25%	0.75%	0.52%	225%
Cohort: 85.01-90 LTV, 740 FICO	1.5%	26.3%	39.7%	25%	0.2%	83.9%	0.18%	0.25%	0.25%	0.50%	0.32%	175%
Cohort: 90.01-95 LTV, 660-679 FICO	6.9%	26.3%	39.7%	30%	0.7%	85.7%	0.57%	2.25%	0.25%	2.50%	1.93%	335%
Cohort: 90.01-95 LTV, 680-699 FICO	5.0%	26.3%	39.7%	30%	0.5%	85.2%	0.41%	1.25%	0.25%	1.50%	1.09%	262%
Cohort: 90.01-95 LTV, 700-719 FICO	3.6%	26.3%	39.7%	30%	0.3%	85.3%	0.30%	1.00%	0.25%	1.25%	0.95%	319%
Cohort: 90.01-95 LTV, 720-739 FICO	2.6%	26.3%	39.7%	30%	0.3%	84.6%	0.21%	0.50%	0.25%	0.75%	0.54%	254%
Cohort: 90.01-95 LTV, 740 FICO	1.9%	26.3%	39.7%	30%	0.2%	83.8%	0.16%	0.25%	0.25%	0.50%	0.34%	222%
Cohort: 95.01-97 LTV, 660-679 FICO	9.6%	26.3%	39.7%	35%	0.5%	87.2%	0.40%	1.75%	0.25%	2.00%	1.60%	405%
Cohort: 95.01-97 LTV, 680-699 FICO	7.0%	26.3%	39.7%	35%	0.3%	86.4%	0.29%	1.00%	0.25%	1.25%	0.96%	335%
Cohort: 95.01-97 LTV, 700-719 FICO	5.0%	26.3%	39.7%	35%	0.2%	86.4%	0.21%	1.00%	0.25%	1.25%	1.04%	509%
Cohort: 95.01-97 LTV, 720-739 FICO	3.6%	26.3%	39.7%	35%	0.2%	86.6%	0.15%	0.50%	0.25%	0.75%	0.60%	406%
Cohort: 95.01-97 LTV, 740 FICO	2.7%	26.3%	39.7%	35%	0.1%	83.0%	0.11%	0.25%	0.25%	0.50%	0.39%	375%
Arithmetic Average	4.14%	26.30%	39.74%		0.36%	85.06%	0.31%	1.00%	0.25%	1.25%	0.94%	310%

*Based on cumulative HPA growth of 10.58% over 2013-2015 using Moody's Economy.com National Average Forecasts
**Estimated Mean Severity = -0.3457 x ln(Cum. HPA) + 0.4782

Mortgage Insurance Companies of America
Simulated Present Value Loss Rate
Net of Mortgage Insurance At Various "Down to" Coverage Levels

"Down-to" Coverage Level	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%
Cohort: 85.01-90 LTV, 660-679 FICO	NA	3.67%	3.24%	2.81%	2.38%	1.96%	1.55%	1.17%	0.83%	0.56%	0.35%
Cohort: 85.01-90 LTV, 680-699 FICO	NA	3.05%	2.70%	2.34%	1.99%	1.65%	1.31%	1.00%	0.72%	0.49%	0.31%
Cohort: 85.01-90 LTV, 700-719 FICO	NA	2.38%	2.10%	1.83%	1.55%	1.28%	1.02%	0.78%	0.56%	0.38%	0.24%
Cohort: 85.01-90 LTV, 720-739 FICO	NA	2.10%	1.86%	1.62%	1.39%	1.15%	0.93%	0.71%	0.52%	0.36%	0.23%
Cohort: 85.01-90 LTV, 740 FICO	NA	1.11%	0.98%	0.86%	0.73%	0.60%	0.48%	0.37%	0.26%	0.18%	0.11%
Cohort: 90.01-95 LTV, 660-679 FICO	3.80%	3.34%	2.89%	2.44%	2.00%	1.58%	1.18%	0.84%	0.56%	0.35%	0.20%
Cohort: 90.01-95 LTV, 680-699 FICO	3.00%	2.64%	2.29%	1.94%	1.59%	1.26%	0.95%	0.68%	0.46%	0.29%	0.18%
Cohort: 90.01-95 LTV, 700-719 FICO	2.42%	2.14%	1.86%	1.58%	1.30%	1.04%	0.79%	0.57%	0.39%	0.25%	0.16%
Cohort: 90.01-95 LTV, 720-739 FICO	1.87%	1.65%	1.44%	1.23%	1.02%	0.81%	0.62%	0.45%	0.31%	0.20%	0.13%
Cohort: 90.01-95 LTV, 740 FICO	1.20%	1.06%	0.93%	0.79%	0.66%	0.53%	0.40%	0.29%	0.20%	0.13%	0.08%
Cohort: 95.01-97 LTV, 660-679 FICO	4.40%	3.80%	3.21%	2.63%	2.07%	1.55%	1.10%	0.73%	0.46%	0.28%	0.16%
Cohort: 95.01-97 LTV, 680-699 FICO	3.88%	3.36%	2.85%	2.34%	1.86%	1.40%	1.00%	0.68%	0.43%	0.26%	0.15%
Cohort: 95.01-97 LTV, 700-719 FICO	3.12%	2.71%	2.30%	1.90%	1.51%	1.15%	0.83%	0.56%	0.36%	0.22%	0.13%
Cohort: 95.01-97 LTV, 720-739 FICO	2.27%	1.97%	1.67%	1.38%	1.10%	0.83%	0.60%	0.41%	0.26%	0.16%	0.09%
Cohort: 95.01-97 LTV, 740 FICO	1.40%	1.21%	1.03%	0.84%	0.66%	0.50%	0.35%	0.23%	0.14%	0.09%	0.05%
Arithmetic Average	2.74%	2.41%	2.09%	1.77%	1.45%	1.15%	0.88%	0.63%	0.43%	0.28%	0.17%

"Down-to" Coverage Level	40%	35%	30%	25%	20%	15%	10%	5%	0%
Cohort: 85.01-90 LTV, 660-679 FICO	0.21%	0.13%	0.07%	0.04%	0.02%	0.01%	0.00%	0.00%	0.00%
Cohort: 85.01-90 LTV, 680-699 FICO	0.19%	0.12%	0.07%	0.04%	0.02%	0.01%	0.00%	0.00%	0.00%
Cohort: 85.01-90 LTV, 700-719 FICO	0.15%	0.09%	0.05%	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%
Cohort: 85.01-90 LTV, 720-739 FICO	0.15%	0.09%	0.05%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%
Cohort: 85.01-90 LTV, 740 FICO	0.07%	0.04%	0.02%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 90.01-95 LTV, 660-679 FICO	0.11%	0.06%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 90.01-95 LTV, 680-699 FICO	0.10%	0.06%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 90.01-95 LTV, 700-719 FICO	0.09%	0.05%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 90.01-95 LTV, 720-739 FICO	0.08%	0.04%	0.02%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 90.01-95 LTV, 740 FICO	0.05%	0.03%	0.02%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 95.01-97 LTV, 660-679 FICO	0.09%	0.05%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 95.01-97 LTV, 680-699 FICO	0.09%	0.05%	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 95.01-97 LTV, 700-719 FICO	0.07%	0.04%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%
Cohort: 95.01-97 LTV, 720-739 FICO	0.05%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Cohort: 95.01-97 LTV, 740 FICO	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Arithmetic Average	0.10%	0.06%	0.03%	0.02%	0.01%	0.01%	0.00%	0.00%	0.00%


Mortgage Insurance Companies of America
Simulated Present Value Loss Rate
Net of Mortgage Insurance at Various "Down to" Coverage Levels
Arithmetic Average of All Cohorts
Average Simulated Present Value Loss Rate Net of Mortgage Insurance
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Current "Down to" Coverage Level
95% 90% 85% 80% 75% 70% 65% 60% 55% 50% 45% 40% 35% 30% 25% 20% 15% 10% 5%
"Down to" Coverage Level for All Cohorts