

NAIC
MORTGAGE
GUARANTY
INSURANCE
STANDARDS MANUAL

(Version 7)

MORTGAGE GUARANTY INSURANCE STANDARDS MANUAL

Purpose and Scope

The Mortgage Guaranty Insurance Standards Manual is designed to:

- 1) Provide a background history of the evolution of the Mortgage Guaranty Insurance Industry including the public and private mortgage environment
- 2) Provide a background description of operating characteristics unique to the Mortgage Guaranty Insurance environment
- 3) Provide a background description of the Mortgage Guaranty Insurance risk environment
- 4) Provide a background history of the Mortgage Guaranty Insurance Working Group efforts, reasons and results contributing to the Mortgage Guaranty Insurance Model Act update
- 5) Provide an understanding of the NAIC Risk Based Capital framework, as modified for Mortgage Guaranty Insurance, to support requirements referenced in the Mortgage Guaranty Insurance Model Act
- 6) Provide an understanding of the Mortgage Guaranty Insurance Loan Level Cash Flow Capital framework to support requirements referenced in the Mortgage Guaranty Insurance Model Act
- 7) Document additional supporting Mortgage Guaranty Insurance standards and requirements referenced but not detailed in the Mortgage Guaranty Insurance Model Act because of the potential for ongoing change triggered by economic conditions
- 8) Facilitate periodic update of technical requirements for Mortgage Guaranty Insurance

The background and guidance outlined in this manual are based on and integral to the requirements established under the *Mortgage Guaranty Insurance Model Act (#630)*, which should be referenced when determining adopted mortgage guaranty insurance law.

Sections I through VII of this Standards Manual provide background information for regulators and mortgage guaranty insurance companies, while Section VIII represents standards intended for enforcement purposes.

MORTGAGE GUARANTY INSURANCE STANDARDS MANUAL

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I. MORTGAGE GUARANTY INSURANCE OVERVIEW

A. Mortgage Guaranty Insurance Definition

Mortgage guaranty insurance provides mortgage lenders with insurance against loss due to borrower non-payment and default on mortgage indebtedness. Specifically, “mortgage guaranty insurance” is:

- (1) Insurance against financial loss by reason of nonpayment of principal, interest or other sums agreed to be paid under the terms of any authorized real estate security; and
- (2) Insurance against financial loss by reason of nonpayment of rent or other sums agreed to be paid under the terms of a written lease for the possession, use or occupancy of real estate.

B. Sources of Mortgage Guaranty Insurance

The primary sources of mortgage guaranty insurance include the following:

1. Private Mortgage Guaranty Insurance

Private mortgage guaranty insurance, referred to as PMI, is provided by commercial insurance companies, typically when the loan to value ratio is greater than 80% of the property’s appraisal value in recognition of the added risk. Private mortgage insurance is designed to indemnify the mortgage loan owner for the outstanding balance and accrued interest due on loan payments in default, as well as real estate taxes and various maintenance costs until claim settlement. The cost of private mortgage guaranty insurance is typically added to the borrower’s mortgage payments. The lender may transfer title to the mortgage insurer, who uses the proceeds from resale to reduce claim costs, upon full claim settlement. Alternatively, the mortgage insurer has the option to pay the limit of coverage and forego the right to acquire title.

2. Public Mortgage Guaranty Insurance

Public mortgage guaranty insurance provides similar mortgage owner insurance through a government agency. The private mortgage insurance industry competes with certain governmental agencies and products.

The majority of public mortgage insurance is provided by governmental agencies that sponsor government backed mortgage insurance programs, primarily the Federal Housing Administration (FHA) and the Veteran’s Administration (VA). During the period 2011, 2012 and 2013, public mortgage guaranty insurance accounted for approximately 77%, 68% and 63% of the total low down payment residential mortgages subject to mortgage guaranty insurance.

The Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) purchase residential mortgages as part of their government mandate to provide liquidity in the secondary mortgage market. These

government sponsored entities (GSEs) have been the major purchaser of mortgages insured by private insurers. GSE purchase of such low down payment mortgage loans requires credit enhancement, of which private mortgage insurance is key.

In 2008, the Federal Housing Finance Agency (FHFA) was appointed as the conservator of the GSEs with authority to control and direct their operations. As conservator, various GSE reforms are under review to reduce the government's overall footprint in housing finance, including the recent development of "Private Mortgage Insurer Eligibility Requirements."

II. PRIVATE MORTGAGE GUARANTY INSURANCE ENVIRONMENT

A. Pre “Great Depression” Programs

The original form of pre “great depression” era mortgage guaranty insurance was an outgrowth of the title insurance business. Coverage insured whole mortgages and guaranteed participation certificates representing a share in either a single mortgage or pool of mortgages originated by either the insuring entity itself or an affiliate.

This mortgage insurance industry collapsed in 1933 as a result of the placement of the majority of industry participants in rehabilitation, which was attributed to a combination of factors, including:

- Market competition among mortgage lenders directing business to companies that would make the largest loan
- Inaccurate property appraisals reflecting values necessary to obtain loan approval
- Loan packaging favoring larger institutions with less desirable mortgages packaged for sale to those of more limited means
- Substitution of less desirable mortgages in pools
- Sale of participations on vacant or foreclosed properties
- Mortgage lender and mortgage guaranty corporation affiliations creating conflicts of interest

B. Post “Great Depression” Programs

Max Karl, a Milwaukee-based attorney, subsequently studied the causes of the original mortgage guaranty insurance industry failure of the 1930’s and reestablished the mortgage guaranty industry in the United States by founding Mortgage Guaranty Insurance Corporation in 1956.

The new business model emphasized:

- Non-affiliation of the mortgage lender and mortgage guaranty insurer
- Monoline licensing requirements
- Investment restrictions on mortgage and mortgage backed securities
- Single family coverage
- Actuarial based premium charges
- Premium income allocation into loss, unearned and contingency reserves
- Commission, rebate and fee prohibitions for placement or purchase of PMI

C. Mortgage Guaranty Insurance Role and Benefits

Private mortgage guaranty insurance provides the following mortgage and borrower related benefits:

- Facilitation of earlier home ownership and equity buildup through low down payment mortgage support
- Borrower expense control through automatic mortgage guaranty insurance lender cancellation on the date when the principal mortgage balance is scheduled to reach 78% of the original property value per the Homeowners Protection Act of 1998
- Borrower financial assistance through private mortgage insurer and lender efforts to protect their housing investment through the restructuring of loan payments or terms and collection efforts to prevent foreclosure in many instances
- Mortgage lender expansion of lendable sources of funds through loan origination credit enhancement

D. Key Private Mortgage Participants

The key participants in the mortgage guaranty insurance environment consist of the following:

1. Loan Originator

The loan originator is the bank or other financial lending institution which creates a mortgage loan to finance ownership of property. The mortgage loan is used by borrowers to obtain funds to purchase real property. The loan is secured by a lien on the borrower's property, which allows the lender to take possession and sell the secured property to pay off the loan in the event of borrower default. The mortgage loan involves two primary documents; the mortgage note, as evidenced by a promissory note to repay, and the security interest in the property, as evidenced by the mortgage document or deed of trust.

The primary financial components of a mortgage loan encompass the following:

- **Loan Term** – the number of years after which an amortizing loan will be fully repaid
- **Payment Amount and Frequency** – the amount paid per period and the frequency of payment installments
- **Principal** – the original amount of the loan which will typically amortize
- **Interest** – the charge to the borrower for obtaining mortgage loan funds
- **Amortization** – the distribution of regular periodic payments of principal and interest to repay the loan into installments

The primary mortgage loan product types in the marketplace include the following:

- **Conventional Loans** – Conventional loans are fixed rate loans with a variety of loan terms (30 years is the most common), whereby mortgage loan payments do not change throughout the loan term. Conventional loans offer the borrower a level of loan payment predictability, but provide no flexibility, particularly for

significant rate declines. The latter environment typically requires the borrower to refinance the loan to take advantage of declining interest rates.

- **Adjustable Rate Mortgages (ARMs)** – Adjustable rate mortgage loans provide for an initial term fixed payment after which rates are readjusted, which can result in negative borrower payment impact in a significantly higher interest rate environment. Rates are typically based on an index reflecting current market conditions. ARMs can have caps, which establish and limit the amount by which the monthly payment or interest rate may change.
- **Interest Only Loans** – Interest only loans allow borrowers to pay only interest on the mortgage for a fixed period of time, after which the borrower has the option to refinance, pay off the higher loan balance or incur potentially significantly higher monthly payments. The interest only loan product is typically designed for strategic borrowers, who anticipate significant subsequent period income which would erase the debt.
- **Negative Amortization Loans** – Negative amortization loans consist of set payments at a level which fails to cover principal and interest due, resulting in a temporary increase in total loan balance. Negative amortization loans are typically designed for borrowers who desire a relatively small initial payment with the intention of subsequently refinancing under a new loan at a later date that will build equity.

Various federal loan modification programs were also established as a result of the sub-prime mortgage crisis, including the following:

- **Home Affordable Modification Program (HAMP)** – The Home Affordable Modification Program is a federal program authorized under the Emergency Economic Stabilization Act of 2008. HAMP is part of the Making Home Affordable Program, which was created by the Financial Stability Act of 2009. The program is designed to assist homeowners who are in danger of foreclosure. The program was built around collaboration between lenders, investors, mortgage servicers, the government sponsored entities and the Federal Housing Finance Agency to create standard loan modification guidelines for lender consideration in conjunction with borrower evaluation for potential modification of loan terms. Under HAMP, lenders and / or mortgage servicers are required to make a calculated net present value determination as to whether entering into a loan modification versus foreclosure would be most beneficial. Loan modification must be pursued if the net present value of expected cash flow is greater under the modification scenario prior to any foreclosure proceedings, absent any considerations associated with fraud or contract prohibitions.

- **Home Affordable Refinance Program (HARP)** – The Home Affordable Refinance Program is a federal program setup by the Federal Housing Finance Agency in March 2009 to assist homeowner mortgage refinancing in instances where borrowers are prevented from taking advantage of lower interest rates through refinancing due to a decline in housing prices, often below the mortgage balance. Accordingly, refinancing became limited by traditional lender requirements for a loan to value ratio of 80% or less to qualify for refinancing without private mortgage insurance. Under HARP, the mortgage must be owned or guaranteed by Freddie Mac or Fannie Mae on or before May 31, 2009 with a current LTV ratio greater than 80% and the homeowner must benefit in terms of either a lower monthly payment or movement to a more stable mortgage product.

2. Mortgage Guaranty Insurer

The mortgage guaranty insurer is the private or public insurer who protects a lender against loss on all or a portion of the principal amount of the mortgage loan upon default and subsequent foreclosure. It is commonly used in loans with a loan to value ratio over 80%. The mortgage guaranty insurer issues a master policy to the bank or other financing institution which sets forth coverage terms and conditions under insurance certificates. The insurance certificate documents the particular characteristics and conditions of each individual loan covered under the master policy. The mortgage guaranty insurance policy premium is typically paid for by the borrower as a component of the monthly mortgage payment. Mortgage guaranty insurance, which is borrower-paid, must be cancelled by the lender when the loan balance is first scheduled to reach 78% of the original property value, irrespective of actual payments. It may also be cancelled if requested by the borrower when the loan has amortized down to below 80% LTV based on the actual or schedule payments. Lender-paid mortgage guaranty insurance typically provides coverage for the life of the loan.

3. Loan Securitizer

The loan securitizer is a business or bank that originates or initiates an asset-backed security through grouping of loans originated in the primary mortgage market for sale as a collateralized mortgage obligation (CMO) or mortgage backed security (MBS) to investors in the secondary market. The secondary market functions as the market for sale of securities or bonds collateralized by the value of mortgage loans. This secondary market serves to provide a new source of capital for the market. Secondary investors typically include insurance companies, pension funds and hedge funds.

III. PUBLIC MORTGAGE GUARANTY INSURANCE ENVIRONMENT

A. Home Owners' Loan Corporation (HOLC)

The origin of the existing housing finance structure in the United States dates back to the Great Depression era. The Home Owners' Loan Corporation Act established the Homeowners' Loan Corporation, which initiated operations in June 1933. The Homeowners' Loan Corporation was founded to refinance home mortgages in default to prevent subsequent foreclosure. The HOLC sold bonds to lenders in exchange for home mortgages experiencing payment problems. The HOLC subsequently refinanced borrower loans typically resulting in loans with a longer term at a lower interest rate. The HOLC subsequently began curtailing lending activities in the mid 1930's and officially ceased operations in 1951, when its last assets were sold to private lenders.

B. Federal Housing Administration (FHA)

The Federal Housing Administration was established under the National Housing Act of 1934. The FHA insures mortgage loans originated by FHA approved banks and other private lending institutions. FHA loans typically require an upfront mortgage insurance premium and an annual mortgage insurance premium paid over the loan term. The FHA assumed a major role in establishing housing finance standards and conditions, insuring mortgages and providing stability to the mortgage market. The FHA subsequently became part of the Department of Housing and Urban Development in 1965 and is the largest mortgage insurer in the United States.

C. Federal National Mortgage Association (Fannie Mae)

The Federal National Mortgage Association was established in 1938 via amendments to the National Housing Act of 1934. Fannie Mae was established to provide local banks with federal money to finance home mortgages in an attempt to raise levels of home ownership and the availability of affordable housing. Fannie Mae developed a secondary mortgage market which provided the ability of banks and other loan originators to reinvest their assets and thereby issue increased mortgage loans through the purchase of Federal Housing Administration insured mortgages. Fannie Mae became a mixed ownership corporation in 1954 with the federal government holding preferred stock while private investors held the common stock. It was subsequently split into the currently known private corporation, Fannie Mae, and the government corporation, Government National Mortgage Association, in 1968. Fannie Mae was authorized to purchase private mortgages not insured by GSEs in 1970. In the same year, Congress established the Federal Home Loan Mortgage Corporation to enhance the secondary mortgage market by competing with Fannie Mae.

D. Government National Mortgage Association (Ginnie Mae)

The Government National Mortgage Association spin-off from Fannie Mae resulted in a government corporation within the U.S. Department of Housing and Urban Development. Ginnie Mae guarantees securities backed by mortgage loans on single-family and small multi-family structures insured by other government agencies, including the Federal Housing Administration, Department of Veterans Affairs and Office of Public and Indian

Housing. Private lending institutions approved by Ginnie Mae originate eligible loan pools, turn them into securities and issue Ginnie Mae mortgage backed securities, which are guaranteed as to the timely payment of principal and interest. Ginnie Mae is the only home loan agency explicitly backed by the full faith and credit of the U.S. Government.

E. Federal Home Loan Mortgage Corporation (Freddie Mac)

The Federal Home Loan Mortgage Corporation was established via the Emergency Home Finance Act in 1970 as a corporation owned by the Federal Home Loan Bank System to compete with Fannie Mae in the secondary market for private mortgages. Freddie Mac buys mortgages in the secondary market, pools them and sells mortgage backed securities to investors in the secondary market, which in turn increases the money supply available for mortgage lending. Mortgage sellers pay a guarantee fee in exchange for Freddie Mac's assumption of the credit risk associated with principal and interest repayment, which benefits investors of these mortgage backed securities. Freddie Mac's ties with the Federal Home Loan Bank System were severed in 1989 under the Financial Institutions Reform, Recovery and Enforcement Act of 1989, resulting in the creation of an 18-member board of directors under the oversight of the U.S. Department of Housing and Urban Development.

F. Federal Housing Finance Agency (FHFA)

1. FHFA Role

The Federal Housing Finance Agency is an independent federal agency established by the Housing and Economic Recovery Act of 2008 to supervise the government sponsored enterprises (GSEs). The FHFA is the successor agency resulting from the merger of the Office of Federal Housing Enterprise Oversight, the Federal Housing Finance Board and the GSE mission office of the U. S. Department of Housing and Urban Development.

The FHFA was additionally appointed conservator of Fannie Mae and Freddie Mac as well as the regulator of the 12 Federal Home Loan Banks in September 2008.

2. FHFA Eligibility Standards

a. Overview

The Federal Housing Finance Agency (FHFA), as current conservator of the Government Sponsored Enterprises (GSEs), has directed Fannie Mae and Freddie Mac to revise, expand and align their risk management requirements for mortgage insurance counterparties. The GSEs are chartered by Congress to provide liquidity and stability in the secondary residential mortgage market. The GSEs require mortgage loans with an outstanding principal balance exceeding 80% of the property value to have an acceptable form of credit enhancement. Primary mortgage insurance typically provides the GSEs with loss protection on mortgage loans exceeding an 80% loan-to-value (LTV).

Each GSE has historically operated under its own set of mortgage insurance requirements, which a private mortgage guaranty insurer must comply with in order to obtain “approved insurer” status. Fannie Mae and Freddie Mac had not updated their MI eligibility requirements since 2003 and 2008, respectively.

Accordingly, the FHFA has issued new Private Mortgage Insurer Eligibility Requirements (PMIERS), which establish a new risk-based framework with emphasis on approved insurer maintenance of sufficient liquid asset levels for claims payment. These PMIERS are potentially critical to the ongoing requirements and ability of the private mortgage insurance industry to balance its responsibilities to maintain sufficient solvency for claim payment as well provide reasonable consumer access to mortgage credit. Accordingly, the initial PMIERS draft was reviewed with various state insurance regulators and private mortgage insurers. Revised PMIERS issued April 17, 2015 and updated June 30, 2015 were subsequently implemented effective December 31, 2015.

The overall objectives of the PMIERS are to:

- Mitigate future GSE losses
- Ensure approved insurers maintain sufficient financial strength to withstand a severe stress macroeconomic scenario
- Create a common set of approved insurer eligibility requirements

Key eligibility requirements under the proposed PMIERS to meet an approved insurer status incorporate the following:

b. Business Requirements

Business requirements emphasize approved insurer general administrative requirements to:

- Establish a documented risk diversification policy and employ risk management tools and techniques to avoid concentrated in-force risk exposure
- Pay or deny claims or rescind coverage within 180 days of claim perfection and rescind or deny any claim not perfected within 120 days from claim filing
- Maintain Fidelity Bond and Errors and Omissions insurance coverage no lower than \$5 million with a deductible not to exceed 5%, if available assets fall below the \$400 million requirement at the end of any calendar quarter

c. Policy Underwriting

An approved insurer must review the acceptability of a loan’s credit risk prior to insuring a loan based on determination of:

- Loan eligibility under the insurer’s underwriting guidelines
- Borrower creditworthiness
- Property valuation supportive of the decision to insure
- Delegated underwriting approval and monitoring safeguards

- Automated underwriting systems recommendation alignment with the approved insurer's independent credit risk guidelines

d. Quality Control

Quality Control guidelines require each approved insurer to:

- Maintain a proactive quality control program to facilitate approved insurer monitoring of compliance with its underwriting standards, ensure data accuracy and prevent approval of mortgages with defects
- Submit annually a copy of its formal Quality Control Program
- Comply with minimum review requirements encompassing independence, proper underwriting, loan selection, source of business, declined applications and formal documented operating procedures
- Complete a post-closing review of income, employment, property valuation and credit history for selected mortgage loan files
- Monitor overall performance through completion of an operational performance scorecard using a prescribed set of indicators

e. Financial Requirements

Financial requirements emphasize maintenance of adequate liquidity and claims paying ability under economic periods of stress based on approved insurer requirements to:

- Establish a Minimum Required Asset level equal to the greater of Total Risk Based Required Assets, based on factors involving vintage, loan to value ratio and credit score, or a floor limit of \$400 million
- Maintain Available Assets at a level which meets or exceeds the above Minimum Required Assets based on cash, bonds, stocks at market value, receivables, subsidiary dividends, and future premium income limited to 210% of the approved insurer's mortgage guaranty insurance premium including any amount assumed from and net of any amount ceded to a non-affiliate reinsurer earned in the prior 12 months on policies written prior to 2009, which phases out as pre-2009 policies run-off
- Maintain at least one rating with a GSE-accepted rating agency
- Obtain GSE approval to enter into any new capital support agreements, assumption of liabilities and certain affiliated or non-affiliated investments, if non-compliance with the above capital requirements exists

f. Failure to Meet Requirements

Failure to meet the PMIERS requirements may result in approved insurer:

- Establishment of an action plan acceptable to the GSEs
- Suspension or termination of its approved insurer status

g. Newly Appointed Insurer Requirements

Newly appointed insurers are required to meet the following conditions to obtain approved insurer status:

- Demonstrate minimum initial capital funding of \$500 million
- Obtain agency ratings no later than 3 years following GSE status approval
- Prohibit holding company or affiliate dividend payments for the first 3 years following GSE approval

h. Conclusion

The PMIERS represent a relatively strong though, unfortunately, unpredictable set of requirements, which individual private mortgage insurers will have to consider in developing their business plan to maintain status as a viable participant in the mortgage guaranty insurance industry.

G. Limited Federal Role in Regulation

Insurance business in the U.S. has been primarily regulated at the state level through insurance laws enacted by state legislators and enforced by state regulators. This state regulation typically consists of:

- Financial oversight of solvency conditions to meet the mortgage guaranty insurer's ability to satisfy policyholder claims
- Marketplace oversight of consumer protection issues related to pricing, advertising, policy terms and licensing

Proponents of the above state regulation cite the local nature of insurance business, mechanics for cooperation among states and better positioning to respond to consumer complaints.

The recent sub-prime mortgage crisis demonstrated that large insurers are often integrated into the broader financial systems. As part of the federal government response to the financial crisis, Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) in 2010. This act established the Financial Stability Oversight Council with responsibilities for monitoring emerging financial risks and designating global systemically important financial institutions (G-SIFIs) and domestic systemically important financial institutions (D-SIFIs). It also established the Federal Insurance Office (FIO) under the U.S. Department of Treasury with authority to monitor and consult on all aspects of the insurance industry, including identification of regulatory issues that could contribute to an insurance industry crisis.

IV. OPERATING CHARACTERISTICS UNIQUE TO MORTGAGE GUARANTY INSURANCE

A. Private Mortgage Insurance Origination Types

Private mortgage insurance is typically categorized by origination type based on the following:

1. Primary Insurance

Primary insurance provides mortgage default protection on individual loans which covers unpaid principal, delinquent interest and expenses associated with the default and subsequent foreclosure or property sale. The insurer generally pays the coverage percentage of the claim amount specified on the insurance certificate with the option to pay 100% of the claim amount and acquire title to the property. Primary insurance is generally written on first lien mortgage loans secured by owner occupied single-family homes which includes one to four unit homes or condominiums. However, primary coverage can be written on any type of occupancy approved by the mortgage insurer, including investor or non-owner occupied single family homes, vacation or second homes.

Primary insurance can be written under either the flow or bulk basis as follows:

a. Flow Basis

Loans are insured on an individual loan-by-loan transaction basis. Premium rates typically vary depending on the perceived risk of a potential claim on the loan type based on consideration of the loan to value ratio, borrower credit score, payment plan, mortgage term and property type. The mortgage instrument may require the borrower to pay for the mortgage insurance, which is referred to as “borrower paid”. Alternatively, the lender may be required to pay the premium, who in turn recovers the premium through an increase in the note rate, which is referred to as “lender paid”.

b. Bulk Basis

Coverage is provided on each mortgage loan included in a defined portfolio of loans insured under a single or bulk transaction. Bulk coverage typically insures the closed loans in an insured portfolio to a specified level of coverage. Loans insured on a bulk basis are typically part of a negotiated transaction, resulting in a composite rate applied to all such loans in the portfolio.

2. Pool Insurance

Pool insurance is generally used as an additional credit enhancement for secondary market mortgage transactions. A pool is a collection of mortgages with similar rates and terms which are often securitized by dividing the pool into bonds backed by the payments of principal and interest into the pool by borrowers. Pool insurance typically covers the loss on a defaulted mortgage loan included in the pool, which is in excess of the loan’s primary coverage, as well as the total loss on a defaulted mortgage which does not require primary coverage. Pool insurance may have a stated aggregate loss

limit for a pool of loans or a deductible under which no loss is paid by the insurer until the deductible is exceeded.

B. Mortgage Guaranty Insurance Environment

Mortgage guaranty insurance overall is governed by the NAIC Statement of Statutory Accounting Principles No. 58.

1. Business Line Unique Characteristics Mortgage guaranty insurance differs from other lines of insurance in a number of areas including the following:

- Mortgage guaranty insurance is typically provided on residential loans consisting of one to four family residences, including condominiums and townhouses
- Majority of policies cover 10%-30% of the loan amount and are written on first mortgages where the loan amount is a relatively high percentage (typically 80% to 95%) of the mortgaged property value
- Lenders obtain mortgage guaranty insurance to facilitate sales of mortgage loans in the secondary markets or to protect against credit losses on loans held in the portfolio
- Individual mortgage loans or pools of mortgage loans are separately underwritten and insured under insurance certificates
- Mortgage exposure periods are significantly longer than for most other types of property and casualty insurance products and can run for the mortgage term with an overall average certificate life of 7 years for primary insurance and 8-12 years for pool insurance
- Insured parties may change over time during the period coverage is in place
- Premium payment plans can typically include monthly, single or annual premium payment terms
- Premium written revenue is typically recognized based on premium plan as follows:
 - Monthly Premium Plan = Revenue is earned in respective months
 - Annual Premium Plan = Revenue is earned on a pro-rata basis over the applicable year
 - Single Premium Plan = Revenue is earned over the policy life
- Mortgage guaranty insurers do not have the option to cancel or non-renew a certificate, except for fraud or premium nonpayment, unlike most other forms of insurance
- Mortgage insurance losses can be attributed to:
 - Underwriting errors in the evaluation of borrower willingness or financial ability to meet mortgage payment obligations
 - Interruptions in borrower earning power
 - Defaults arising from adverse local or regional economic conditions
 - Widespread defaults arising from severe U.S. economic downturns
 - Undetected mortgage fraud

- Mortgage guaranty insurer options under a default scenario include:
 - Payment of the percentage of insured loss identified on the insurance certificate
 - Property acquisition by the insurer and payment of the lender's entire loss with tender of merchantable title
 - Property sale with claim payment based on the actual lender loss up to the percentage of coverage identified in the insurance certificate
- Mortgage guaranty insurers are required to maintain a contingency reserve liability to protect policyholders against loss in an amount equal to 50% of earned premium for ten years regardless of coverage period
- Contingency reserves may be subject to early release based on commissioner approval when actual incurred losses exceed 35% of the corresponding earned premium

2. Monoline Considerations

Mortgage guaranty insurers are licensed on a monoline basis to require that they devote full attention to the unique business line characteristics highlighted above and their potential exposure to infrequent, but very significant swings and downturns in the economy impacting employment and housing prices.

3. Conflict of Interest Considerations

Mortgage guaranty insurers are prohibited from engaging in potential conflicts of interest

which may ensue based on underwriting mortgage guaranty insurance on:

- Mortgages originated by a member's holding company system
- Mortgages originated by an affiliate of the holding company system
- Mortgages originated by a lender to which credit is extended by the holding company system or its affiliates

C. Underwriting Standards

1. Master Policy Concepts

A mortgage guaranty insurer's master policy establishes the terms and conditions of insurance coverage under individual insurance certificates. The master policy includes various conditions for approving or denying coverage, notification of loans in default and claims settlement. Master policy contractual provisions have received increased scrutiny in accordance with the sub-prime mortgage crisis, resulting in the establishment of Government Sponsored Entity (GSE) revised requirements to ensure greater uniformity and consistency.

Typical master policy coverage includes policy and procedure requirements related to:

- Insurance application

- Commitment and Certificate issuance
- Coverage eligibility
- Cancellation and rescission
- Policy servicing
- Claim submission, settlement and reporting
- Subrogation

2. Direct Underwriting Role and Responsibilities

Underwriting refers to the process by which a mortgage insurer assesses the eligibility of a customer to receive insurance coverage and the adequacy of property value collateral as a basis for loan approval or denial. The underwriting process involves measurement of the risk exposure and determination of the premium commensurate with the above risk exposure. The majority of risks that underwriting considers fall under the commonly referred to three C's of loan underwriting:

- Credit – Borrower credit history
- Capacity – Borrower financial ability to repay
- Character – Borrower commitment to honor debts

Direct underwriting refers to the process by which the mortgage guaranty insurance company's internal underwriting function directly reviews the loan documentation and approves or denies coverage. Direct mortgage guaranty insurer underwriting typically provides for the establishment of various internal underwriter authority levels based on underwriter experience and loan amount risk limits. The mortgage guaranty insurer's underwriting process is controlled by detailed underwriting guidelines as it relates to the company's:

- Underwriting philosophy
- Mortgage guaranty insurance application
- Loan type eligibility
- Borrower eligibility
- Property eligibility

In addition to the borrower's credit, capacity and character referenced above, mortgage guaranty insurance loan eligibility is generally assessed based on:

- **Property Type and Purpose** – which may include primary residences including 1-4 unit properties, condominiums, townhouses and second homes
- **Loan to Value (LTV)** – ratio of the total outstanding mortgage balance to the property value or sale price
- **Loan Amortization Period** – the maximum length of time that loan payments fully amortize the principal balance

3. Delegated Underwriting Role and Responsibilities

Delegated underwriting authority refers to the process by which a mortgage guaranty insurer authorizes the initial lender or another first party to underwrite loans on behalf of the mortgage insurer under a delegated underwriting program. A delegated underwriting program establishes those specific requirements under which insurance coverage is extended for a loan submitted to the mortgage guaranty insurer on its behalf via an approved delegated underwriter, in accordance with the mortgage guaranty insurer's eligibility criteria. The loan application is typically submitted to the mortgage guaranty insurer via some form of delegated underwriting transmittal. Mortgage guaranty insurer approval of a delegated underwriter under its delegated underwriting program is typically based on an initial and ongoing review of the lender's performance, underwriting practices, underwriter training and financial stability. The delegated underwriting program in effect requires the originating lender to adhere to credit guidelines and processes comparable to those of the mortgage guaranty insurer. Loan documents can typically be submitted via various mail, fax, courier or electronic methods. Overall, the mortgage guaranty insurer relies on the lender's submission of accurate and valid information, consistent with the delegated underwriting decision, subject to some form of post-origination quality review sampling to validate ongoing compliance.

4. Automated Underwriting Systems Role

Automated underwriting systems (AUS) refers to automated system programs containing edits established to facilitate review of loans submitted for mortgage guaranty insurance to ensure that they are in compliance with the company's internal underwriting guidelines and standards. Loans which the automated underwriting system detects as failing compliance with such underwriting guidelines are typically identified and forwarded to other more senior underwriters for further documentation and/or customer review to make a final underwriting approval or denial decision. Automated underwriting systems can consist of mortgage guaranty insurer internal automated systems or GSE agency underwriting systems such as Fannie Mae's Desktop Underwriter or Freddie Mac's Loan Prospector.

Private Mortgage Insurer Eligibility Requirements being proposed by the GSEs require that an approved insurer must utilize a risk review process to ensure that AUS recommendations are aligned with an approved insurer's independent credit risk guidelines, if AUS recommendations are used for its own purpose or as part of a delegated underwriting program.

5. Borrower Credit Worthiness Evaluation

Borrower eligibility for mortgage guaranty insurance typically involves review and evaluation of the following underwriting components:

- ***Credit History***

Underwriting review of the borrower's credit history is completed to evaluate borrower willingness and ability to manage debt and repay the loan. Credit history reports, which are provided by several major reporting agencies, typically will evaluate payment delinquency history and other adverse credit issues associated with bankruptcy, foreclosure, judgments, and charge-offs.

Credit history is traditionally evaluated based on credit scores obtained from various independent consumer reporting agencies. A credit score is a single number calculated from the major credit report agency data that seeks to quantify the borrower's credit worthiness. The most widely used credit scoring system is the FICO Credit Score created by the Fair Isaac Corporation in the 1990's. The major components of the FICO Credit Score include:

- Payment history
- Amounts owed as percentage of all available credit
- Length of credit history
- New credit recently opened
- Types of credit used

- ***Income Sources***

Underwriting review of income sources is completed to identify the borrower's future ability to maintain mortgage repayment schedules. Qualifying income review will typically encompass evaluation of employment stability, base salary, commissions, self-employment, co-borrower income sources, investment income including interest and dividends, pensions, and rental income.

- ***Debt to Income (DTI)***

Underwriting review of debt to income ratios is completed to evaluate the reasonable ability of the borrower to comfortably afford applicable mortgage premium payments. Debt to Income is the ratio of a borrower's monthly debt payments to monthly qualifying income, which is an indicator of a borrower's capacity to repay a mortgage. Higher debt to income ratios are indicative of increased use of credit with a smaller margin to withstand future income fluctuations.

- ***Down Payment***

Underwriting review of the borrower's down payment is completed to evaluate the borrower's commitment to add equity to the property being mortgaged through various liquidity sources including savings, gifts, asset sale or other financing. A borrower's down payment reflects the ability to save as well as invest in the property. The greater the down payment, the less likely a loss will be realized by a mortgage insurer.

6. Property Value Evaluation

Underwriting review of property value is completed to evaluate its market value to support the reasonable eligibility for mortgage insurance and reasonably confirm the value at risk. Property valuation typically includes review of:

- Comparable values with other similar property types
- Property condition
- Housing design and characteristics
- Housing trends

Property valuation is generally obtained via an independent appraisal report along with photos of the subject property.

7. Loan Documentation

Minimum mortgage guaranty insurance underwriting documentation requirements generally include the following, as discussed in detail above:

- Lenders loan application
- MI application
- Credit history reports
- Credit score
- Verification of income sources and assets
- Appraisal report

Additional loan documentation at loan closing, which mortgage insurers do not typically use, includes:

- Mortgage - lien on the property as security
- Promissory Note - to pay off the loan
- Settlement Statement - accounting of all fees and charges
- Warranty Deed - detail property description
- Title Search - certification of ownership
- Other - various regulatory compliance notifications

D. Quality Control Standards

1. Loan Origination Integrity Objectives

The overall purpose of an internal quality program is to:

- Monitor and evaluate the:
 - Integrity of a mortgage guaranty insurer's loan underwriting process in terms of adherence to company guidelines
 - Accuracy of data and documentation relied on

- Prevention of approval of mortgages bearing deficiencies associated with fraud, inaccurate data or insufficient loan documentation
- Provide ongoing organizational feedback concerning the effectiveness of the loan origination process and identification of weaknesses requiring corrective action

2. Organizational Considerations

A mortgage guaranty insurer's quality control program should be structured, staffed and customized to ensure reasonable coverage based on specific organizational considerations related to:

- Organizational size
- Geographic areas of operation
- Mortgage origination volume and types
- Loan origination sources
- Staff experience

3. Quality Control Best Practices

a. Separation of Responsibilities

Assignment of responsibilities for a mortgage guaranty insurance company's quality control program should ensure it is independent from the mortgage origination, underwriting and processing functions it is monitoring. Reporting lines of authority should provide the ability to independently evaluate and critique internal operating practices without fear of reprisal.

b. Quality Control Program Documentation

A mortgage guaranty insurance company's quality program should be formally documented to ensure understanding and establish measurement criteria as it relates to:

- Purpose
- Responsibilities
- Management and board of director oversight
- Review scope
- Sample selection
- Documentation and communication of findings
- Corrective action
- Administration policies and procedures

c. Post Closing Reviews

A quality control program should provide for sample review of mortgages to monitor internal direct underwriter compliance with loan approval guidelines and standards.

Quality control reviews are completed most often on a post-closing basis. Quality control program loan sampling should ensure mortgage loan sampling is reasonably representative of the mortgage insurance company's business production process as it relates to:

- Branch office originations
- Underwriting staff originations
- Loan product / type originations
- Third party originations

The quality control review process should encompass validation and/or verification of the following:

- Data entry accuracy into applicable underwriting systems
- Income documentation
- Employment documentation
- Property appraisal and valuation

d. Loan Sampling / Selection

Loan selection should consider the benefits of the following sampling practices.

- **Random Sampling** – provides for the opportunity for sample selection based on an equal chance of every mortgage being selected. Random sampling removes the potential for bias in comparison to a sampling process based on every nth mortgage. Random sampling can typically be based on random number generation utilizing random number tables or a computer generated program. Mortgage guaranty insurers with larger loan production volumes may typically consider use of a more sophisticated statistically based sampling methodology to ensure a reasonable confidence level within a margin of error.
- **Targeted Sampling** – provides for discretionary sample selection for specific populations which may be deemed to be associated with higher risk concerns. Targeted sampling may be appropriate to consider as it relates to review of:
 - Delinquent loans
 - New origination offices
 - New underwriters
 - Suspected fraud
 - Declined applications
 - High volume loan originators

- Loan origination patterns of non-compliance

e. Re-verification Procedures

Quality Control programs typically should include sample re-verification of key documentation relied on in the original underwriting decision, including:

- **Employment and Other Income** – based on review of applicable pay stubs, salary vouchers, W-2 forms, tax returns and financial statements
- **Self-Employment Income** – based on tax returns and financial statements
- **Other Sources of Funds** – based on depository account and investment statements
- **Credit History** – based on independent credit reports
- **Property Valuation / Marketability** – based on independent appraisal reports

f. File Documentation Review Procedures

Quality Control program review of file documentation should emphasize:

- Verification of the existence and accuracy of mortgage file documents
- Conformance to underwriting requirements and guidelines
- Evaluation of underwriting decisions in accordance with the file documents
- Comparison of original documents with re-verifications

The overall objective is to review loan production for “Early Warning Detection” signs of potential inconsistencies associated with the following:

- **Application** – unsigned, undated or contradictory changes
- **Credit Report** – incomplete payment histories or derogatory information
- **Employment Records** – inconsistencies with employment record or alterations
- **Appraisal Report** – ordered by parties other than lender or lack of reasonable housing comparables in the marketplace
- **Loan Closing Documents** – mortgage term differences from underwriting, unusual settlement statement items or alterations
- **Underwriting Decision** – loan approval unsupported by file documentation

g. Loan Review Results Reporting

A Quality Control Program should provide for formal and timely management reporting and review of ongoing quality control procedures. Reporting should be based on reasonableness in relation to the company’s size and loan production operations. Quality Control report distribution should encompass applicable internal risk management committee, board audit or other oversight committee and operating area management. Accordingly, Quality Control reporting should consider:

- Loan sample selection
- Mortgage file review findings and recommendations to responsible operating areas and senior management
- Management responses
- Corrective action recommendations and status

E. Reserving Principles

1. Typical Reserving Practices

Loss reserving refers to the overall process of estimating reasonable liability accruals for unpaid loss and loss adjustment expenses for business lines of insurance for which a meaningful definition of expense can be assigned.

Historically, mortgage guaranty insurance reserving considerations were characterized as:

- Lacking statistical independence
- Underwritten to a very low loss ratio
- Focused on location and mortgage type versus the insured

Mortgage guaranty insurance reserving practices encompass the following unique characteristics.

2. Loss Reserves

Mortgage guaranty insurance unpaid loss and loss adjustment expense is recognized in accordance with SSAP No. 55. The claimable event in mortgage guaranty is the foreclosure by the insured. The default of a borrower arising from the credit risk associated with the mortgage loan is considered the incident that gives rise to a claim and is the point at which a mortgage insurer books a reserve. Loss reserves are typically established by estimating the claim rate or number of delinquent inventory loans which are likely to result in claim payment and an estimate of the severity or claim amount. The process for estimating the reserve liability includes projections for losses that have been reported as well as those that have been incurred but not reported. Estimates are based on historical data, trends, economic factors and other statistical information including paid claims, reported losses and insurance in force. Mortgage guaranty insurance reserves are not typically recognized for estimates for future claims on insured loans that are not currently in default.

Mortgage loss reserve estimation is judgmental and can be impacted by a variety of factors, including:

- Unemployment trends impacting personal borrower income
- Housing market values impacting borrower equity

- Economic conditions at a national or local level
- Ongoing claim rescission and settlement practices
- Risk characteristics associated with a particular class of loans

3. Unearned Premium Reserves

Unearned premium reserves are computed based on premium revenue recognition. Monthly policy premiums are earned as coverage is provided. Premiums written on a single and annual premium basis are initially deferred as unearned premium and earned over the certificate term typically on a monthly pro rata basis. Premiums written on policies covering more than one year are earned over the certificate life in accordance with the expiration of risk. Certificate cancellation results in immediate recognition of earned premium for all non-refundable premiums, while refundable premium is returned to the borrower or lender, depending on who was paying for the coverage.

4. Contingency Reserves

Mortgage guaranty insurers maintain contingency reserves to protect policyholders from loss during periods of extreme adverse economic conditions in accordance with SSAP No. 58. Contingency reserves are increased annually in an amount equal to 50% of the earned premium from mortgage guaranty insurance contracts. Contingency reserves are required to be maintained for a period of ten years. Contingency reserves may be released in any year in which actual incurred losses exceed 35% of the corresponding net earned premiums with domiciliary commissioner approval.

Mortgage guaranty insurers are allowed to deduct the annual addition to contingency reserves from gross income only if special non-interest bearing US Mortgage Guaranty Tax and Loss Bonds are purchased in an amount equal to the tax benefit from the deduction. Annual deductions not utilized for tax purposes during the current period may be carried forward for a period of eight years, similar to the carryforward of a net operating loss.

5. Premium Deficiency Reserves

Premium deficiency reserves are required to be recognized under SSAP No. 58 when anticipated losses, loss adjustment expenses, commissions and other maintenance costs exceed the recorded unearned premium reserve, contingency reserve and the estimated future renewal premium on existing policies. Premium deficiency reserves are recognized by recording an additional liability for the deficiency with a corresponding charge to operations.

F. Reinsurance Principles

Reinsurance refers to the contractual arrangement under which an insurer, the ceding company, transfers some or all of the risk related to a policy or group of policies to another insurer, known as the assuming reinsurer. The ceding and assuming companies enter into a reinsurance agreement which details the conditions upon which the reinsurer would pay a share of the claims incurred by the ceding company. Reinsurance enables an insurance

company to expand its capacity, stabilize underwriting results, finance expanding volume, secure protection against catastrophic losses and spread larger risks across other institutions.

The essential element of a reinsurance contract is the transfer of risk, which requires evidence of reinsurer assumption of significant insurance risk under the reinsurance portions of the underlying agreement and reasonable understanding that the reinsurer may realize significant loss from the transaction.

The two basic types of reinsurance are treaty and facultative. Treaty reinsurance is written to cover a particular class of policies issued by the reinsured. Facultative reinsurance is issued on an individual policy based on analysis of the terms and provisions of the underlying policy.

Reinsurance coverage is typically allocated on either a proportional or non-proportional basis. Proportional reinsurance provides coverage for only a portion or percentage of the loss or risk typically based on the percentage of premiums paid. Proportional reinsurance arrangements may be issued under a quota share basis, whereby a fixed percentage of each policy is reinsured, or a surplus basis, whereby the balance of risk exceeding a ceding company's retention limit is reinsured.

In contrast, non-proportional reinsurance provides coverage based on a set amount of loss typically exceeding a base or deductible amount. The primary forms of non-proportional reinsurance include excess of loss and stop loss. Excess of loss reinsurance provides for coverage when total claims paid in a given period exceed a stated amount established based

on an excess per risk, occurrence or aggregate risk basis. Stop loss reinsurance provides coverage when a company specified threshold amount of total annual losses, typically expressed as a percent of premium, has been reached.

1. Affiliate Reinsurance

Mortgage guaranty insurers have in the past typically reinsured loans in excess of 25% of the risk in force with affiliated companies, to satisfy certain statutory reinsurance requirements applicable to such companies, which require a mortgage guaranty reinsurer to limit its retention under a single policy of insurance to no more than 25% of debt of the mortgage borrower. Affiliated reinsurance has increasingly been viewed as an additional element of administrative overhead, which results in the spreading of the financial condition among affiliated related companies versus presenting a consolidated financial picture.

2. Captive Reinsurance

Captive reinsurance programs refer to mortgage guaranty insurer business cessions to reinsurers that are affiliated with mortgage lending institutions. Under a captive reinsurance arrangement, a portion of the mortgage guaranty insurance risk written by a primary mortgage insurer that pertains to loans originated or serviced by a particular mortgage lender is transferred to a reinsurance company that is owned or controlled by

the loan originator or servicing institution, which is referred to as a captive reinsurer. The lender establishes a captive reinsurer and undertakes reinsurance assumption of insurance risk through its captive to participate in the profits that can be potentially realized from providing mortgage guaranty insurance on mortgage loans that are originated or serviced by the lender.

The use of captive reinsurance arrangements in the mortgage guaranty insurance industry expanded significantly in the mid 1990's and became a standard business practice in the mortgage lending industry prior to the sub-prime mortgage crisis. However, post crisis various mortgage lenders and insurers were named as defendants in class action lawsuits alleging causes of action related to captive mortgage arrangements, including that the lenders' captive reinsurers received excessive premium in relation to the risk assumed by those captives. This litigation alleged violations of the anti-referral fee provisions of the Real Estate Settlement Procedures Act (RESPA). The above litigation resulted in various settlements with the Consumer Financial Protection Bureau, including fines and agreements not to enter into such future captive arrangements.

3. External Reinsurance

External reinsurance with non-affiliates within the mortgage guaranty insurance industry has historically been limited by the number of reinsurers with capacity and expertise in this specific line of business.

External reinsurance placement has recently been reviewed and used by various mortgage guaranty insurers to free up additional sources of capital to meet increasing capital requirements imposed as a result of the experience under the sub-prime mortgage crisis and economic downturn. External reinsurance arrangements typically require reinsurer ratings of "A" or better and collateralization involving either a clean irrevocable letter of credit or a trust agreement.

G. Rescission Principles

Mortgage guaranty insurers have the contractual right to rescind coverage if the financial institution that originated the mortgage loan misrepresented material information. Rescission typically arises as a result of overstatement of borrower income and ability to repay the loan or overvaluation of the property being mortgaged. The legitimate use of rescission protects those policyholders that do not violate such representations or warranties or misrepresent material information.

Rescission was a major factor in the mortgage guaranty insurance industry's loss mitigation efforts during the mortgage sub-prime crisis and economic downturn. Historically, mortgage guaranty insurer practices resulted in the rescission review and decision not to pay in conjunction with claims payment at the back-end. Accordingly, subsequent GSE master policy requirements have advocated the implementation of rescission relief principles, which emphasize the following more definitive transparency practices:

1. Mandatory Rescission Relief

Mortgage insurer definitive requirements to provide rescission relief after 36 timely payments from the borrower's own funds

2. Early Rescission Relief

Mortgage insurer optional provisions to provide early rescission relief before mandatory requirements based on independent re-verification of repayment from the borrower's own funds after 12 monthly payments

3. Material Misrepresentations or Fraud Impacts

Mortgage insurer retention of rescission remedies associated with intentional misstatements, misrepresentations, omissions and data inaccuracies in connection with the loan origination or closing based on:

- Materiality to mortgage insurer acceptance of the risk
- Credible evidence

Mortgage Guaranty Insurance Model Law amendments have implemented similar rescission relief concepts based on materiality, credible evidence and compliance with the insurer's overall internal payment history and loan status eligibility guidelines, in an effort to address potential ongoing regulatory environment changes in specific eligibility criteria over time.

V. MORTGAGE GUARANTY INSURANCE RISK ENVIRONMENT

A. Traditional Mortgage Loan Default Factors

Traditionally, mortgage loan default has been attributed to the following major factors:

1. Unemployment

Unemployment rate increases translate to potential borrower/homeowner reduction of personal family income, which in turn drives reduction in consumer spendable income levels and potential increases in mortgage delinquency, defaults and eventual foreclosure.

2. Medical Expense

Significant increases in medical expenses associated with personal or family health care similarly result in unanticipated reduction of family income, which translates into mortgage payment delinquency.

3. Income Reduction

Death or divorce can result in significant loss of combined family income and disruptions in the stability of established life patterns, which translates into reduction of personal income available and the ability to meet mortgage loan payments based on combined family income.

Additional factors emerging in recent years include:

- Strategic default related to a borrower decision to cease making payments due to significant reduction or elimination of equity in property due to declining prices
- Payment shock resulting from a significant increase in monthly mortgage payments due to an interest rate reset or the end of an interest only period combined with the lack of refinancing opportunities

B. Mortgage Loan Sub-Prime Crisis and Risk Factors

1. Sub-Prime Crisis Overview

The sub-prime mortgage crisis in the U.S. refers to the series of events and economic conditions that led to a financial crisis and subsequent recession beginning in 2008. The subprime mortgage environment is a term generally used by lenders to designate mortgage borrowers who are characterized by weak credit histories and limited repayment capacity. The crisis was characterized by a rise in sub-prime mortgage delinquencies and foreclosures along with a resulting decline in related mortgage-backed securities. These mortgage-backed securities, which initially offered attractive rates of return due to higher mortgage interest rates, experienced significant defaults related to the lower credit quality associated with sub-prime mortgages. U.S. outstanding mortgage delinquencies and foreclosures are estimated to have

approximated 14% by 2009. Some ten states accounted for approximately 74% of foreclosure filing activity.

2. Sub-Prime Crisis Background / Timeline

The subprime crisis was initially triggered by the bursting of the United States housing bubble which peaked during 2005-06. Prior to this period, loan incentives encompassing relatively easy credit terms and long-term rising house pricing trends, resulted in borrowers obtaining mortgages often exceeding their financial means in anticipation of the ability to easily refinance. The ability to refinance became more difficult as interest rates rose while housing prices dropped during 2006-07. The ensuing expiration of initial loan terms on adjustable rate products and decline in home prices resulted in increases in loan defaults and foreclosures. This ongoing foreclosure activity became a key factor in the more global economic crisis associated with the overall depletion of consumer wealth and the financial strength of banking institutions.

The increase in mortgage-backed securities during the housing and credit boom resulted in increasing institutional and retail investment in the U.S. housing market. However, as housing prices declined, major financial institutions experienced significant losses associated with heavy investment in such mortgage-backed securities. These resulting losses impacted the ability of financial institutions to lend, leading to an overall downturn in economic activity.

Losses in the stock market and ongoing housing value declines continued to result in a downturn in consumer spending, which represents a key component of economic prosperity. The risks to the economy created by this housing market downturn and subsequent financial market crisis led to central bank decisions to cut interest rates and government implementation of various economic bail-out and stimulus packages. These stimulus packages included one-time tax cuts for households and businesses, expansion of GSE mortgage lending authority and encouragement of borrowers and lenders to negotiate changes to minimize foreclosures.

3. Sub-Prime Crisis Causes

The subprime crisis was attributed to a number of pervasive conditions in the housing and credit markets, including:

- Homeowner inability to make mortgage payments due to overextension of credit, weak lending practices and resetting of previously attractive adjustable rate mortgages
- Overbuilding during the mortgage boom period flooding the housing market
- Erosion of the sense of responsibility in the lending process resulting in risky mortgage products involving limited documentation requirements to obtain loan approval

- Mortgage-backed security investments which potentially concealed the risk of mortgage default and reflected misleading agency ratings related to the sub-prime mortgages backing such investments
- Reluctance of government to intervene in the mortgage market under the presumption that financial institutions and borrowers can effectively manage and control the marketplace
- Persistently low interest rates which led fixed income investors worldwide to reach for yield, which created demand for complex mortgage-backed securities such as Collateralized Debt Obligations (CDO's), of which many investors had little understanding

4. Housing Market Boom versus Bust Cycle

The period from the mid 1990's to early 2006 is often referred to as the "boom" period. The housing market and economic environment conditions during this period were generally characterized by:

- Solid housing demand versus supply
- Falling mortgage interest rates
- Rising household income
- Falling unemployment
- Affordable housing prices

The price of the typical house is estimated to have increased approximately 124% at the peak housing "bubble" in 2006 according to the Economist.com. This housing bubble was characterized by:

- High rates of household debt
- High rates of home ownership
- Rising housing prices
- Low interest rates
- Generally easy credit conditions
- Increased consumer borrowing and spending
- Speculation that housing prices would continue to rise

The above economic environment resulted in a building boom leading to a surplus of unsold homes and a peak in housing prices. Sub-prime lending helped fuel this increase in home ownership which drove prices higher. Borrowers who had planned to refinance mortgages after several years of appreciation were confronted with higher monthly payments leading to an increase in payment defaults by 2008, often referred to as the "bust" period. Foreclosures and the supply of homes for sale increased as a result of the default rate. Housing prices significantly declined, resulting in negative equity associated with real estate values falling below mortgage balances. In addition, many

negative equity households were also impacted by a weakening job market encompassing job layoffs and terminations.

The increase in mortgage defaults also reduced the value of mortgage-backed securities, which impacted the banking and financial system resulting in increased losses, tighter lending standards and restrictions, an overall decline in bank capital and the write-down of investments under mark to market accounting rules. The U.S. economy collapsed under this crisis in housing.

5. Lending / Borrowing Practice Deterioration

Lending standards deteriorated during the period prior to the mortgage crisis and economic downturn. Mortgage loan qualification guidelines became progressively weaker, characterized by:

- Borrower assertion of income acceptance as a replacement for proof of income
- Bank account verification as a replacement for proof of employment requirements
- “Alt-A” or prime loans bearing solid credit scores, but possessing other credit or data limitation issues
- “No doc” loans, characterized by high loan to value, excessive debt to income or low credit scores
- Lender reliance on automated loan approval systems, thereby authorizing loans without appropriate underwriting review and documentation verification prior to loan approval

6. Securitization Practices Impact

Traditional mortgage lending involved loan origination to the borrower/homeowner with retention of the credit risk associated with loan payment default. Current mortgage lending typically involves loan securitization. Securitization is the process by which loans are bundled to create a form of bond security which can be sold to investors. Securitization allows the lending bank to retain capital to make additional loans. For example, the Government Sponsored Enterprises or GSEs, among others, pool conforming mortgages, sell the bonds to investors and guarantee those bonds against default on the underlying mortgages.

The securitization process was allowed to undermine responsible lending and shift incentives, resulting in an increased focus by lending institutions on processing of mortgage loans for sale and the distribution of related credit risk to investors through mortgage-backed securities and other collateralized debt obligations, often at the expense of properly ensuring credit quality. Securitization accelerated, tripling during the period from the mid 1990’s to the mid-2000’s, often involving pooling of higher risk sub-prime loans. Investors found comfort in claims that collateralized debt obligations and other structured securities could match and hedge securitized mortgage product risks with other investments that would proportionately rise or fall in value. Mortgage loan funding originated increasingly from non-bank institutions including investment

banks, hedge funds and finance companies, forming a “shadow banking” system which was subject to limited regulatory oversight and public disclosure.

7. Mortgage Rating Agency Impact

Credit rating agencies came under increased scrutiny for assigning investment grade ratings to mortgage-backed securities backed by risky sub-prime mortgage loans. High credit ratings were justified based on risk reduction practices involving credit default insurance and equity investor willingness to bear one or more layers of initial loss. Investors relied on these ratings, which became a key contributor to the financial meltdown.

Rating agencies subsequently lowered credit ratings on mortgage-backed securities during the subprime crisis period, forcing the financial institutions to lower the value of their investment portfolios and acquire additional capital to maintain solvency ratios. The adjustment of the value of marketable securities to market value was required under accounting standards designed to assist investors in understanding the value of invested assets at a point in time rather than any historic or intrinsic value.

VI. MORTGAGE GUARANTY INSURANCE WORKING GROUP
ROLE and HISTORY

A. Working Group Charge

The Mortgage Guaranty Insurance Working Group (MGIWG) was formed by the National Association of Insurance Commissioners (NAIC) in 2012.

The MGIWG charge was twofold:

1. Solvency Improvement

The MGIWG's primary objective was to determine and make recommendations regarding changes deemed necessary to improve the solvency regulation of mortgage guaranty insurers.

2. Mortgage Guaranty Model Act Enhancement

The MGIWG's secondary objective was to recommend changes and enhancements to the Mortgage Guaranty Insurance Model Act to support improved solvency regulation.

B. Working Group Major Concerns Promoting Reform

Major MGIWG issues promoting the reform of the Mortgage Guaranty Insurance Model Act were primarily a direct outgrowth of the sub-prime mortgage crisis and included the following concerns:

- Mortgage origination activity concentration in a limited number of large banks placed undue pressure on mortgage guaranty insurers to accept loan origination offerings with limited review of credit quality in lieu of the potential consequences of reduced business volume.
- Mortgage guaranty insurance characteristically is a countercyclical environment, whereby relatively long periods of profitability are interrupted by periods of varying duration of catastrophic loss resulting in solvency weaknesses, as exemplified by the recent mortgage loan sub-prime crisis environment.
- Lack of formal minimum underwriting standards resulted in increased loan default, delinquency and foreclosure rates associated with the acceptance of sub-prime credit loans and reduced documentation loans under existing underwriting practices.
- Lack of formal quality assurance functions resulted in limited internal compliance monitoring to complement underwriting guidelines.
- Risk to capital methodology for measuring the minimum amount of capital relative to risk in force necessary for the mortgage insurer to continue writing new business did not serve the mortgage industry exceptionally well during the mortgage sub-

- prime crisis with solvency issue recognition generally occurring prior to the capital ratio reaching the 25:1 maximum ratio.
- Securitization through complex repackaging of subprime mortgages into investments, further contributed to the financial crisis, associated with increased default risk from the standpoint of reduction in alignment of loan originator and mortgage guarantor insurer interests and incentives to ensure borrower repayment credit quality.
 - Contingency reserve historic allocations are not driven by economic indicators of potential mortgage crisis and economic downturn resulting in relatively easy depletion when losses exceed 35% of corresponding earned premiums.
 - Lack of geographical concentration limits to address historical trends, which demonstrated that local market conditions can and do impact regional delinquency and foreclosure experience, resulted in high loss concentration in selective regions.
 - Existing reinsurance practices resulted in resource concentration in affiliates leading to unnecessary overhead expenses, and captive reinsurers, which led to regulatory sanctions associated with questionable risk transfer.
 - Mortgage guaranty insurer investments in mortgages and real estate were not directly related to the ordinary conduct of mortgage business.
 - Rescission practices resulted in evaluation of the ability to deny coverage historically on the back-end, based on analysis of loan origination documents in conjunction with normal claims processing, versus more upfront transparent recognition at the time commitment coverage was issued.

C. Mortgage Guaranty Insurance Industry Considerations

Mortgage Guaranty Insurance Industry Group initial considerations with respect to Mortgage Guaranty Insurance regulation generally encompassed the following industry recommendations:

- Mortgage originator and insurer alignment of interests so that the credit risk is shared.
- Mortgage originator and insurer maintenance of strong underwriting standards, favoring conversion of underwriting standards into risk capital modeling approaches.
- Mortgage guarantor awareness and correction of underwriting standards deterioration stemming from behavioral incentives influencing mortgage originators and insurers.

- Mortgage guaranty insurer establishment of countercyclical capital buffers and reserves during the underwriting cycle valleys to provide for claims during peak downturns.
- Mortgage insurer implementation of sound mortgage underwriting practices as it relates to developing, monitoring and enforcing standards for the verification and documentation of borrower related information, sustainable debt to income limits, loan-to-value (LTV) ratios and appraisal evaluation of property marketability.

Industry comments regarding subsequent Mortgage Guaranty Insurance Model Act revisions have emphasized the following considerations:

- Establishment of a proper regulatory balance between the need to:
 - Effectively manage overlapping FHFA/GSE and NAIC authorities
 - Define the proper location of detailed requirements within the NAIC Mortgage Guaranty Insurance Model Act, the Mortgage Guaranty Insurance Standards Manual, FHFA/GSE Private Mortgage Insurer Eligibility Standards and standards for mortgage insurance master policies
- Implementation of an improved capital and reserving framework encompassing:
 - Risk based capital requirement assessment
 - Claims paying sufficiency evaluation
 - Capital enforcement through early warning triggers with regulatory actions
- Employment of RBC-like measures that permit prudent risk taking based on capital strength without unduly restricting the mortgage insurer's ability to insure sound, profitable business
- Incorporation of sound principles for the conduct of underwriting, quality assurance and contractual business practices to strengthen risk management
- Supervisory examination guides and standards manuals consideration for detailed business practice expectations to allow for more timely revision and incorporation of potential changes in business practices

D. Mortgage Guaranty Insurance Model Act Summary Reforms

Accordingly, the Mortgage Guaranty Insurance Model Act amendments have emphasized incorporation of the following major provisions to address the above Mortgage Guaranty Insurance Working Group and Industry Group considerations:

1. Capital Standards

The current Mortgage Guaranty Insurance Model Act seeks to ensure the advantages of an economically countercyclical risk-based methodology in the form of the State

Regulatory Mortgage Insurer Capital Standard. There is a dual structure for a mortgage guaranty insurance company to report upon its capital adequacy:

- State Regulatory Mortgage Insurer Capital Standard Report - A mortgage guaranty insurance company must prepare and submit a State Regulatory Mortgage Insurer Capital Standard Report to its Domiciliary Commissioner and the NAIC on or before March 31st of each year for the immediately preceding calendar year.
- Mortgage Guaranty Insurance Loan Level Report - Establishment of a detailed loan level cash flow projection calculated quarterly in accordance with certain defined parameters and required to be reported when a mortgage guaranty insurer reports or experiences a SRMICS Action Level Event. Upon the occurrence of a SRMICS Action Level Event, the Mortgage Guaranty Insurance Loan Level Report supports company requirements to submit a detailed action plan to address potential solvency issues.

2. Underwriting Standards

The revised Mortgage Guaranty Insurance Model Act and supporting Standards Manual establish formal minimum standards for underwriting guidelines, which serve to establish a supervisory framework to ensure that lenders are obtaining adequate documentation, undertaking effective verification of financial information including income, maintaining reasonable debt service coverage and loan to value ratios, and making reasonable inquiry to resolve problems without significant market disruption.

3. Quality Assurance Standards

The revised Model Act establishes a Quality Assurance standard to complement the underwriting guidelines through the establishment of mortgage guaranty insurer independent internal quality assurance guidelines, which provide a prospective “early warning system” to monitor and identify potential risk, control and compliance weaknesses associated with:

- Senior management oversight
- Board of director oversight
- Loan policy and procedure documentation
- Underwriting risk tolerance levels and exposures
- Lender underwriting performance
- Mortgage guaranty insurer underwriter performance

- Problem loan trends
- Underwriting system change oversight
- Pricing and performance oversight
- Internal audit validation

4. Concentration Limits

The State Regulatory Mortgage Insurer Capital Standards, through its Economic Factor, has been designed to minimize the risk and strengthen control over geographic business mix by using state-level data for home prices and per capita income.

5. Investment Limitations

Mortgage Guaranty Insurance Model Act investment limitations reduce potential mortgage guaranty insurer risks associated with portfolio concentrations in securities reflective of investment in the same industry risk as the mortgage guarantor's primary business. This encompasses investment restrictions, as well as additional capital requirements, for securities which represent an ownership interest in or are secured directly or indirectly by a pool of mortgages or cash flows generated by a pool of mortgages which are not guaranteed by the full faith and credit of the United States.

6. Reinsurance

Mortgage Guaranty Insurance Model Act provisions emphasize greater reinsurance flexibility options through:

- Discouragement of affiliate reinsurance arrangements, thereby permitting mortgage guaranty insurers to achieve improved administrative efficiencies
- Financial quality standards compliance for external reinsurance programs
- Prohibition of captive reinsurance arrangements which have been the subject of legal actions

7. Rescission

Mortgage Guaranty Insurance Model Act amendments have emphasized provisions for greater rescission relief, which are anticipated to be generally consistent with ongoing GSE regulatory requirements under review and / or reasonable practices aligned with those requirements, including:

- Master policy definitions of both insurer and insured rescission rights and responsibilities to provide for greater transparency
- Rescission relief provisions based on MI underwriting validation, timely payment history and suspected material misrepresentation considerations

VII. MORTGAGE GUARANTY INSURANCE CAPITAL REQUIREMENTS

A. One Capital Standard with a Dual Reporting Structure

1. Introduction to the NAIC State Regulatory Mortgage Insurer Capital Requirement

Shelter is one of the great necessities of human physical life, typically prioritized right after food and clothing. People will always strive mightily to maintain a minimum standard of shelter consistent with their needs. Within the context of their overall objectives in life, people will seek to optimize the quality of shelter that their resources allow. For this reason, home prices maintain a relationship with income. Historical data shows that when the growth of home prices exceeds the growth in income by a significant margin, there tends to be a correction in home prices that restores the long-term relationship between home prices and per capita income. Conversely, if adverse economic circumstances cause home prices to fall below the level that could be sustained by the incomes of people living in that vicinity, there tends to be an upturn in home prices that restores the long-term relationship between home prices and per capita income. It is very seldom that the situation is ever in perfect equilibrium.

Mortgage guaranty insurance offers credit enhancement that facilitates the issuance of mortgage loans with less than a 20% down payment, which has long been the level of equity considered necessary to prudently issue a mortgage without some form of credit enhancement. While private mortgage guaranty insurance is not the only form of credit enhancement available for mortgage loans, it is the most flexible and scalable of those sources. Accordingly, it is important that the capacity of the private mortgage guaranty insurance industry be available at an appropriate level in all economic conditions.

The cause of foreclosures that presents the greatest variability in nearly all situations is unemployment. While it is possible for any particular person to become unemployed regardless of economic conditions, the risk of unemployment for which mortgage guaranty insurance companies must prepare is mass unemployment occasioned by economic recessions or depressions. Accordingly, it is expected that these insurers will and must have remarkably strong financial positions. However, extreme redundancies of capital are not automatically optimal. Capital is not to be had free of charge. Excessive regulatory demands for capital will make their way into the rates charged borrowers and thereby affect access to home ownership. It is also desirable that the regulatory capital standard be transparent and predictable for the mortgage guaranty insurance companies and their counterparties.

The previous 1976 version of the Mortgage Guaranty Insurance Model Act established that a mortgage guaranty insurance company had to maintain a level of capital necessary to equal or exceed a ratio of risk to capital of 25 to 1. This would probably be reasonable if all mortgage loans were at a fixed rate and the borrower's only choice is whether to fully amortize over 15 years or 30 years. However, there are numerous

options available in the mortgage loan market, such as whether the rate will be fixed or variable, the manner of amortization, and the extent of documentation required, among others. Furthermore, there is a wider accessibility to mortgage loans in terms of credit history and debt-to-income ratios than was the case in 1976.

The NAIC State Regulatory Mortgage Insurer Capital Standard establishes a capital requirement, based on a risk-modeled ultimate loss estimate, at the level of each insured mortgage loan based on the underwriting risk characteristics, economic conditions, and the mortgage guaranty insurance company's exposure to risk at origination. There are adjustments made at the Book Year and aggregate level, but the foundation of the capital requirement is established at the loan level.

The NAIC State Regulatory Mortgage Insurer Capital Standard establishes the capital requirement for each insured mortgage loan based on the relationship of home prices to per capita income at the state level. By so doing, the capital requirement addresses geographic concentration risk and recognizes variations in market conditions across the United States.

Most importantly, the NAIC State Regulatory Mortgage Insurer Capital Standard is economically countercyclical. As constructed, the capital requirements rise as home prices become less affordable relative to per capita incomes, very substantially so when there is indication of a housing market bubble. This is intended to prompt mortgage guaranty insurance companies to become progressively more selective in their underwriting standards. Conversely, as home prices decline and become objectively more affordable relative to per capita incomes, capital requirements decline. While the viewpoints of members of the Mortgage Guaranty Insurance Working Group differed, a consensus was reached to maintain the 25 to 1 risk-to-capital ratio from the previous 1976 version of the Mortgage Guaranty Insurance Model Act as a floor below which the capital requirement could not go. The reduction in capital requirements occasioned by a decline in home prices, which typically coincide with adverse economic conditions, is intended to encourage mortgage guaranty insurance companies to become prudently more expansive in their underwriting standards and thereby aid economic recovery.

As constituted, the NAIC State Regulatory Mortgage Insurer Capital Standard is a capital requirement with definite consequences. Although the Domiciliary Commissioner is not mandated to do so, a mortgage guaranty insurance company whose capital falls below its State Regulatory Mortgage Insurer Capital Standard could be placed into receivership. This would not be the first option explored in such a circumstance. A Capital Plan would be prepared by the company, the Domiciliary Commissioner would be either conducting an examination or an intensive analysis, and there is the likelihood of a Corrective Order being issued by the Domiciliary Commissioner. However, the fact of the mortgage guaranty insurance company's failure to maintain its capital above the State Regulatory Mortgage Insurer Capital Standard is by itself sufficient grounds for receivership.

By the time a mortgage guaranty insurance company were to fail its State Regulatory Mortgage Insurer Capital Standard, it is to be hoped that the Domiciliary Commissioner has assembled a team of competent experts to assist insurance department staff in the assessment of the company's financial condition, risk exposures, and remediation plans, so that the company's financial condition is either restored or an orderly run-off can be effectuated, whether within or without a receivership proceeding. Given the lead times required under responsible government contracting practices, Section 7D of the Mortgage Guaranty Insurance Model Act authorizes the Domiciliary Commissioner to retain consultants once the ratio of Total Adjusted Capital to SRMICS is 125% or less.

Since it is an admirable human tendency to never give up, it is advisable to set certain boundaries in advance. There comes a point at which the odds that a company may be saved are too remote relative to the damage that will be visited upon policyholders, creditors, and the public if there is a failure. This is the purpose of the SRMICS Mandatory Control Level Event, which has been set at a ratio of Total Adjusted Capital to SRMICS of 50% or less. In such an instance, the Domiciliary Commissioner must take actions necessary to place the company in receivership. As with the Mandatory Control Level under the NAIC Risk-Based Capital structure, there is provision to allow the Domiciliary Commissioner to forego actions for up to one year after a SRMICS Mandatory Control Level Event if there is a reasonable expectation that the capital deficiency could be eliminated in a reasonable period of time. However, as a practical matter, this would effectively require broad acceptance from commissioners throughout the United States. In any case, a mortgage guaranty insurance company must stop writing new business following a SRMICS Mandatory Control Level Event or, if applicable, it is no longer financially hazardous under the terms of any applicable regulatory orders.

2. Dual Reporting Structure

The NAIC Mortgage Guaranty Insurance Model Act establishes a single capital standard, the State Regulatory Mortgage Insurer Capital Standard, but has a dual structure for a mortgage guaranty insurance company to report upon its capital adequacy.

a. State Regulatory Mortgage Insurer Capital Standard Report

A mortgage guaranty insurance company must prepare and submit a State Regulatory Mortgage Insurer Capital Standard Report to its Domiciliary Commissioner and the NAIC on or before March 31st of each year for the immediately preceding calendar year.

b. Mortgage Guaranty Insurance Loan Level Report

A mortgage guaranty insurance company must prepare and submit a detailed loan level cash flow projection based on the guidance for such reports contained in

Section VII(C) and Section VIII(E) as of each calendar-quarter-end within ninety (90) days following the end of such calendar quarter.

The State Regulatory Mortgage Insurer Capital Standard is based on what have historically been the most important factors indicative of mortgage loan risk. However, the risk management unit of a mortgage guaranty insurance company is constantly engaged in far more granular and specialized studies of risks and opportunities. In the course of developing a capital standard for the revisions to the Mortgage Guaranty Insurance Model Act, parameters for a ten-year sources and uses financial projection under a very adverse stress scenario of a deep recession attained consensus. This, too, is merely an abstract of the overall activity and considerations occurring in the risk management unit of any mortgage guaranty insurance company. However, the regular maintenance of such a financial projection would ensure the availability to regulators of important company-specific information in the event of serious financial reversals. Such a financial projection could serve as a foundation and point of reference for other financial scenarios or to assess the effect of various risk mitigation options in the event of a SRMICS Action Level Event or a SRMICS Mandatory Control Level Event. Having a set of common parameters for this financial projection would allow for comparability if adverse economic circumstances were to affect the entire mortgage guaranty insurance industry. This should provide some measure of confidence in the financial projections among those regulators that will in some degree depend upon them in making decisions regarding the company.

B. State Regulatory Mortgage Insurer Capital Standard Concepts

1. Overview

The NAIC State Regulatory Mortgage Insurer Capital Standard is similar to NAIC risk-based capital (RBC) in that it provides a capital adequacy standard which:

- Is risk related
- Provides a safety net for insurers
- Provides uniformity among state regulators
- Provides regulatory authority for timely action

The NAIC State Regulatory Mortgage Insurer Capital Standard is distinguished from RBC in the following respects:

- It is customized for the mortgage guaranty line of business.
- It is countercyclical in that it is intended to increase the margin of safety as factors historically indicative of risk track increasingly excessive residential real estate prices, which tend to reach their apogee in economic expansions or booms, and to decrease the margin of safety as the risk factors track residential

real estate prices that are becoming lower than historical measures of fair value, which tend to reach their nadir in economic recessions or depressions.

- The countercyclical nature of the SRMICS recognizes the important role of mortgage guaranty insurers in the housing finance system of the United States in that this countercyclicality promotes an appropriate level of availability of this insurance continuously throughout economic cycles.
- It allows reasonable premium credits, which recognizes that mortgage guaranty insurance tends not to lapse or cancel in the manner of most other lines of insurance, but rather continues until a given level of equity is achieved, the insured residential real estate is sold, or there is a foreclosure.

2. Purpose

The NAIC State Regulatory Mortgage Insurer Capital Standard establishes a minimum capital requirement appropriate for an insurance company to support operations based on its risk profile.

3. Applicability

Mortgage guaranty insurance companies have historically been exempted from the RBC requirement due to their unique operating environment, as previously discussed under Section IV. One of the objectives of updating the Mortgage Guaranty Insurance Model Act was to develop a risk-based methodology specifically adapted to the mortgage guaranty insurance line of business.

4. High-Level Methodology

The methodology of the NAIC State Regulatory Mortgage Insurer Capital Standard encompasses the following components:

a. SRMICS Capital Formula

The NAIC State Regulatory Mortgage Insurer Capital Standard establishes a targeted minimum capital level which is compared to the company's actual capital level. The SRMICS is calculated by applying a set of actuarial based risk factors to various asset, premium, and reserve balances. Higher risk factors reflect greater underlying risks.

b. Mortgage Guaranty Insurance Model Act

The Mortgage Guaranty Insurance Model Act grants state insurance regulators authority to take specific actions based on the level of capital impairment, which is defined as the ratio of Total Adjusted Capital to the NAIC State Regulatory Mortgage Insurer Capital Standard.

c. Regulatory Action Levels

There are four action levels applicable to mortgage guaranty insurers under the Mortgage Guaranty Insurance Model Act:

- No Action based on Total Adjusted Capital of more than 125% of the NAIC State Regulatory Mortgage Insurer Capital Standard and no indication of material deficiencies in underwriting procedures or in the Mortgage Guaranty Quality Control Program.
- At or below 125% of the NAIC State Regulatory Mortgage Insurer Capital Standard, or if an examination or investigation has indicated material deficiencies in underwriting procedures or in the Mortgage Guaranty Quality Control Program, Section 7D of the Mortgage Guaranty Insurance Model Act provides that the Domiciliary Commissioner may retain consultants to assist in the assessment of the insurer's risks, reporting, and remediation plans at the insurer's expense.
- SRMICS Action Level Event (Total Adjusted Capital of between 51% and 100% of the NAIC State Regulatory Mortgage Insurer Capital Standard) – requires the mortgage guaranty insurer to file a Capital Plan, Domiciliary Commissioner examination or analysis of the insurer, issuance by the Domiciliary Commissioner of a Corrective Order, and allows regulator control of the insurer if this is deemed in the best interests of the policyholders and creditors of the insurer and of the public
- SRMICS Mandatory Control Level Event (Total Adjusted Capital of less than 51% of the NAIC State Regulatory Mortgage Insurer Capital Standard) – requires the mortgage guaranty insurer to cease writing new business and requires the Domiciliary Commissioner to place the insurer under regulatory control. Although the Domiciliary Commissioner may defer seizing regulatory control of the insurer for up to one year after the occurrence of a SRMICS Mandatory Control Level Event, such deferment would, in practice, require the support of substantially all nondomestic states that have enacted the NAIC Mortgage Guaranty Insurance Model Act.

5. Phases, Steps, and Distinct Considerations of the State Regulatory Mortgage Insurer Capital Standard

From start to finish, the calculation of the State Regulatory Mortgage Insurer Capital Requirement can be regarded as having twelve steps in four phases, which include fifteen distinct considerations, consisting of factors, rates, credits, and specialized capital charges. This section will provide an overview of the four phases and twelve steps in the calculation.

a. Individual Mortgage Loan Phase

The State Regulatory Mortgage Insurer Capital Requirement requires that a formulaic calculation of the Risk-Modeled Ultimate Loss on each insured loan based upon certain characteristics at origination. This Risk-Modeled Ultimate Loss does not change as long as the loan is insured and does not go into default. This phase consists of the following step:

Step 1 – Calculate the Risk-Modeled Ultimate Loss for each insured loan.

b. Book Years Phase

Once the Risk-Modeled Ultimate Loss for each mortgage loan insured has been calculated, the Risk-Modeled Ultimate Losses for the insured mortgage loans are organized by Book Year. Since only insured mortgage loans outstanding are included, this means that the sum of the Risk-Modeled Ultimate Losses represents the Risk Modeled Future Loss for each Book Year. It is at the Book Year level that a seasoning factor is applied to adjust the Risk Modeled Future Loss for each Book Year, that credit for ceded reinsurance is taken, a margin for expense is added, and a premium credit is allowed. This phase consists of the following steps:

Step 2 – Aggregate the Risk-Modeled Ultimate Loss for each insured loan outstanding by Book Year.

Step 3 – Apply the appropriate seasoning factor to the Risk Modeled Future Loss for each Book Year.

Step 4 – Calculate and subtract risk ceded through reinsurance by Book Year.

Step 5 – Calculate and add the margin for expense by Book Year.

Step 6 – Calculate and subtract the premium credit by Book Year.

c. Aggregation Phase

It is at this phase that all of the assembled Book Year data is aggregated and certain additional capital charges and the premium credit for single pay policies and certificates is applied. It is in this phase, also, that the mortgage guaranty insurance company's Total Adjusted Capital is computed. This phase consists of the following steps:

Step 7 – Aggregate the results of Steps 2 through 6 for the past twenty Book Years.

Step 8 – Add 10% of the risk in force on Pool Mortgage Guaranty Insurance.

Step 9 – Add 5% of the risk in force on reinsurance assumed.

Step 10 – Subtract the single premium credit to obtain the State Regulatory Mortgage Insurer Capital Standard as of the effective date of the calculation.

Step 11 – Compute Total Adjusted Capital.

d. Evaluation Phase

In the Evaluation Phase, the ratio of Total Adjusted Capital to the State Regulatory Mortgage Insurer Capital Requirement is computed. Based on the result, certain regulatory actions could be indicated. This phase consists of the following step:

Step 12 – Divide Total Adjusted Capital by the State Regulatory Mortgage Insurer Capital Standard to determine applicability of regulatory action.

6. Description of Distinct Considerations in the State Regulatory Mortgage Insurer Capital Standard

The State Regulatory Mortgage Insurer Capital Standard applies fifteen distinct factors, rates, credits, and capital charges to arrive at an economically countercyclical risk-based margin of safety developed to recognize risk and control elements unique to the mortgage guaranty industry. This section explains the purpose, method of calculation, and basis of development of each of these fifteen distinct factors, rates, credits, and

capital charges. This section provides an explanation of why the State Regulatory Mortgage Insurer Capital Standard was designed as it is. For an explanation of how the State Regulatory Mortgage Insurer Capital Standard is calculated, see Section VIII (D).

a. Base Rate Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes a base rate factor of 0.55%. After the FICO Score Factor, the Loan-to-Value Ratio Factor, Alternative Risk Factor, High Risk Factor, Risk Offset Factor, and premium credit factors were developed, a base factor was selected. The base factor of 0.55% was selected based on a detailed modeling of the number and timing of insolvencies that would have occurred had the entire mortgage guaranty industry been placed into run-off for the years 2005 to 2013.

b. FICO Score Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of the borrower's FICO Score. The higher the credit score, the less risk the mortgage loan has of going into default. The relativities for the FICO Score Factors were developed based on a logistical regression analysis and empirical odds relativity was calculated as the ratio of the odds of a given cohort relative to the odds from a baseline cohort.

c. Loan-to-Value Ratio Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of the loan-to-value (LTV) ratio at the time of origination. The lower the loan-to-value ratio, the less risk the mortgage loan has of going into default. The relativities for the Loan-to-Value Ratio Factor were developed based on a logistical regression analysis and empirical odds relativity was calculated as the ratio of the odds of a given cohort relative to the odds from a baseline cohort.

d. Alternative Risk Factors

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of the number of certain alternative risk factors that, if present at loan origination, have been noted to increase the risk of default. As the number of alternative risk factors that apply to any particular mortgage loan increases, so does the risk of default. There were six alternative risk factors identified during the development of the State Regulatory Mortgage Insurer Capital Requirement: (1) loan purpose other than purchase; (2) property type other than single family residence; (3) an amortization term of greater than 360 months (30 years); (4) amortization type other than fixed; and (5) a back-end debt-to-income ratio greater than 43% and less than or equal to 50%. The relativities for the Alternative Risk Factor were developed based on a logistical regression analysis and empirical odds relativity was calculated as the ratio of the odds of a given cohort relative to the odds from a baseline cohort.

e. High Risk Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of the number of certain high risk factors that, if present at loan origination, have been noted to substantially increase the risk of default. As the number of high risk factors that apply to any particular mortgage loan increases, so does the risk of default. There were four high risk factors identified during the development of the State Regulatory Mortgage Insurer Capital Requirement: (1) lack of full documentation; (2) interest-only or other non-fully amortizing loan; (3) an occupancy type other than primary; and (4) back-end debt-to-income ratio above 50%. The relativities for the High Risk Factor were developed based on a logistical regression analysis and empirical odds relativity was calculated as the ratio of the odds of a given cohort relative to the odds from a baseline cohort.

f. Risk Offset Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of the number of certain offsetting risk factors that, if present at loan origination, have been noted to decrease the risk of default. As the number of offsetting risk factors that apply to any particular mortgage loan increases, the risk of default decreases. There were three offsetting risk factors identified during the development of the State Regulatory Mortgage Insurer Capital Requirement: (1) more than one borrower; (2) original loan term is less than or equal to 240 months (20 years); and (3) the loan originator is a credit union. The relativities for the Offsetting Risk Factor were developed based on a logistical regression analysis and empirical odds relativity was calculated as the ratio of the odds of a given cohort relative to the odds from a baseline cohort.

g. Economic Factor

The calculation of an individual mortgage loan's Risk-Modeled Ultimate Loss includes consideration of an Economic Factor. An important, indeed vital, criterion for the Mortgage Guaranty Insurance Working Group in designing the State Regulatory Mortgage Insurer Capital Requirement was to introduce a countercyclical component to the capital requirement for mortgage guaranty insurance companies. This countercyclical component is incorporated into the capital requirement through the Economic Factor. Historical data shows that when the growth of home prices exceeds the growth in income by a significant margin, there tends to be a correction in home prices that restores the long-term relationship between home prices and per capita income.

The Economic Factor is measured using two economic data series from publicly available sources: state level per capita income and the FHFA conventional and conforming home price index. The capital model compares the rolling four-year change in income relative to the four-year change in home prices. State-level per capita income data is published with a one-year lag. That is, 2018 income data

would not be collected and published until 2019. The rolling home price index calculation would be performed using a quarterly data series.

The difference in the 4-year change between home price growth and income is applied to an equation to develop the RBC capital factor. The specific equation is:

Economic Factor = $Max(1, \min(20, e^{5x}))$, where x = percentage difference in 4 year change between home price appreciation and per capita growth measured at the State level

In developing the Economic Factor, a time series of the Economic Factor from 1980 through 2018 was prepared for all States as well as a weighted average portfolio using the State distributions in the loan-level data obtained from the mortgage guaranty industry. From the observations of this time series data, it was decided that, to capture regional differences in economic risks and portfolio concentration, the economic factors should be calculated and assigned at the state level.

The Economic Factor equation was estimated by comparing the historical claim odds relativities from the loan-level data against the economic variable at the state level, national level, and using a state weighted average. The loan-level data and claim rates were calculated by origination year for origination years 1995 through 2008. Odds relativities were calculated using 2000 as the baseline year. An exponential curve was fit against the data and parameters were selected upon reviewing State level results and national average results. The parameters Alpha = 1 and Beta = 5 were the final selections.

Empirical odds relativities were also compared to the origination year odds ratios from the logistic regression analysis performed on the loan-level dataset. It should be noted that the odds ratios from the logistic regression would represent a national weighted-average portfolio and would not be state specific.

A comparison of the empirical odds ratios, logistic regression, and state-level weighted average exponential fit was made against the Economic Factor. The exponential fit produces results that are consistent with the empirical data and logistic regression.

A minimum floor of 1 was applied to the equation and a maximum value of 20. These values were judgmentally selected after reviewing the distribution of historical data by state and quarter. For some regions, the economic factor exceeded 40 (i.e. in California for originations in the third quarter of 2006). A cap was applied to these instances in order to produce an aggregate annual factor that was consistent with the empirical data and logistic odds ratios when calculated by origination quarter and state and aggregated to a historical weighted-average basis.

h. Severity Rate

The calculation of an individual mortgage loan’s Risk-Modeled Ultimate Loss includes consideration of a Severity Rate. In certain instances, mortgage guaranty insurance companies may have exposure to mortgage loans with a coverage amount in excess of standard coverage for primary mortgage guaranty insurance (i.e. “deep cover” mortgage insurance) or the ground-up loss for a pool of mortgages. Therefore, a severity component is required to assess the capital levels of a mortgage guaranty insurance company when the coverage amount is in excess of standard coverage.

The severity rate is calculated at the loan level as a function of the original loan-to-value ratio of the mortgage and the Economic Factor. The higher the original loan-to-value ratio of the mortgage, the greater the severity rate. The higher the Economic Factor, the greater the severity rate. The severity rate, expressed as a percentage of the original loan amount, is a linear function of the Economic Factor, and the intercept is set by the original loan-to-value ratio. The equation below describes the calculation of the severity rate.

$$\text{Severity Rate} = \text{Intercept} + \text{Slope} * \text{Economic Factor}$$

The tables below provide the intercept and slope of the function required to calculate the severity rate.

| Original loan-to-value Ratio | Intercept | Slope |
|------------------------------|-----------|-------|
| (0, 10] | 0.100 | 0.02 |
| (10, 20] | 0.100 | 0.02 |
| (20, 30] | 0.100 | 0.02 |
| (30, 40] | 0.150 | 0.02 |
| (40, 50] | 0.200 | 0.02 |
| (50, 60] | 0.250 | 0.02 |
| (60, 70] | 0.300 | 0.02 |
| (70, 80] | 0.350 | 0.02 |
| (80, 85] | 0.375 | 0.02 |
| (85, 90] | 0.400 | 0.02 |
| (90,95] | 0.425 | 0.02 |
| 95+ | 0.450 | 0.02 |

As the data from the mortgage insurers does not include ground-up severity, publicly available data from the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation Mac as of June 30, 2018 was used to develop the severity component. The data were normalized between the two entities. The data from Fannie Mae and Freddie Mac includes loan-level information on the unpaid principal balance at the time of a claim, the expenses associated with the claim, delinquent interest paid to the investor for the claim, and net proceeds from the sale of the property. This data was processed to calculate a severity rate for each loan with a loss in the data. The equation below provides the components of severity for this analysis:

$$\text{Severity Rate} = \frac{\text{Unpaid Principal Balance} + \text{Expenses} + \text{Delinquent Interest} - \text{Sale Proceeds}}{\text{Original Unpaid Principal Balance}}$$

The data was processed and summarized by state, origination quarter, and loan-to-value bucket; the severity rate was calculated for each unique combination of the foregoing three variables. Using state and origination quarter, the Economic Factor was calculated for each state and origination year combination.

A linear regression was performed on the data to estimate the relationship between the Economic Factor and the severity rate. The regression produced an R-Square value of between 50% and 60% for loan-to-value ratio cohorts above 40%. The data is volatile and limited for lower loan-to-value ratios. The resulting intercepts were smoothed between loan-to-value cohorts, and a slope of 0.02 was selected for each loan-to-value cohort.

The intercept in the severity equation is greater than standard coverage amounts, so the severity rate would be capped at 100%. For pool loans, the severity rate is applied as a haircut to the capital requirement.

i. Seasoning Factor

At the Book Year level, the State Regulatory Mortgage Insurer Capital Standard applies a Seasoning Factor, which is based on the length of time a loan has been insured by the mortgage guaranty insurance company in recognition of the fact that aged loans are typically less risky, more stable and have less exposure to catastrophic risk.

j. Credit for Reinsurance Ceded

At the Book Year level, the State Regulatory Mortgage Insurer Capital Standard applies a credit for reinsurance ceded, which serves to reduce the capital requirement. In recent years, a viable reinsurance market has become available to mortgage guaranty insurance companies, which had been virtually nonexistent since the 1980s. Reinsurance is commonly provided by traditional multi-line reinsurers, as well as special purpose reinsurers supported by proceeds held in trust from the sale of insurance-linked notes. The spread of risk provided by reinsurance should be encouraged as a valuable risk management tool for mortgage guaranty insurance companies.

Due to the multiplicity of different terms and conditions involved in reinsurance, it is essential that the mortgage guaranty insurance company seeking credit provides appropriate documentation with its State Regulatory Mortgage Insurer Capital Standard Report to demonstrate that reinsurance would apply to the Risk Modeled Future Loss, as adjusted by the seasoning factor, by Book Year.

k. *Margin for Expense*

At the Book Year level, the State Regulatory Mortgage Insurer Capital Standard establishes a margin for expense at 1% of risk in force, which is intended to recognize the overhead expenses that would be entailed in administering the business until it has run off. This margin for expense increases the capital requirement. While premium rates charged vary depending on the underwriting characteristics of the risk and with market conditions, this margin for expense is roughly equivalent to 10% of direct premium written.

l. *Premium Credit by Book Year*

At the Book Year level, the State Regulatory Mortgage Insurer Capital Standard applies a credit equal to two years of run-off premium. This amount is subtracted from the capital that would otherwise be required. At the Book Year level, only monthly premium policies and certificates are included. This would include primary flow business and Bulk Mortgage Guaranty Insurance.

Mortgage insurance companies typically collect monthly premium for insured policies, and the policies are typically in force until the underlying mortgage refinances or reaches a loan-to-value ratio at or below 78% through either amortization, home price appreciation, or some combination thereof. Therefore, any mortgage guaranty capital model should include a recognition of future premium. The credit for future premium is equal to two years of premium for active insured loans.

The premium credit factors were developed after reviewing historical run-off triangles using the loan-level data obtained from the mortgage guaranty insurance industry. Specifically, run-off triangles were developed from the loan-level data and used to calculate the average life by origination year. The run-off triangles were calculated on performing loans (i.e. not delinquent) only, since delinquent loans, by definition, are not paying premium. While the premium may be advanced by servicers, the servicing advances are typically included in the final severity calculation.

Based on a review of the run-off triangles, the credit for future premium factors was selected as two years of credit for loans that are active. The premium credit only applies to performing loans.

m. *Capital Charge for Risk in Force on Pool Mortgage Guaranty Insurance*

At the aggregate level, the State Regulatory Mortgage Insurer Capital Standard applies a 10% capital charge for the risk in force on Pool Mortgage Guaranty Insurance, which is added to the overall capital requirement.

n. Capital Charge for Risk in Force on Assumed Reinsurance

At the aggregate level, the State Regulatory Mortgage Insurer Capital Standard applies a 5% capital charge for the risk in force on assumed reinsurance, which is added to the overall capital requirement.

o. Credit for Single Premium Policies and Certificates

At the aggregate level, the State Regulatory Mortgage Insurer Capital Standard establishes a premium credit for single premium policies and certificates. Based on a study of recent years' experience, the factor required to achieve a reasonable equivalent of two years of run-off premium is 26.9% of the reserve for unearned premium, as reflected in the statutory financial statement as of the date the computation is made.

C. Mortgage Guaranty Insurance Loan Level Report Concepts

1. Overview

The mortgage guaranty insurance industry engaged external consultants to introduce improvements over the previous Risk to Capital and Minimum Policyholders Position capital requirements to address weakness noted during the recent mortgage sub-prime crisis. The core design principles of this mortgage industry capital model project emphasize:

- Increased risk and premium sensitivity incorporating the impact of macroeconomic factors
- Forward looking capital assessment at multiple points in the future
- Comprehensive modeling incorporating both asset and liability stress scenarios
- Adaptability to accommodate new product features
- Transparency and credibility with key regulatory stakeholders and compatibility with other regulatory and supervisory frameworks

2. Purpose

The overall objective of the mortgage industry capital model project was to develop a risk sensitive framework for estimating the sufficiency of mortgage guaranty insurer capital to withstand losses under a stress scenario.

The resulting capital framework estimates the amount of starting claims paying resources necessary to satisfy liabilities, including claim losses and expenses, for a run-off portfolio over ten years projected consistently with a macroeconomic stress path, given the expected premium income and investment income. Solvency is defined as available capital resources remaining above zero for the full duration of the capital model's projection period.

3. Key Assumptions

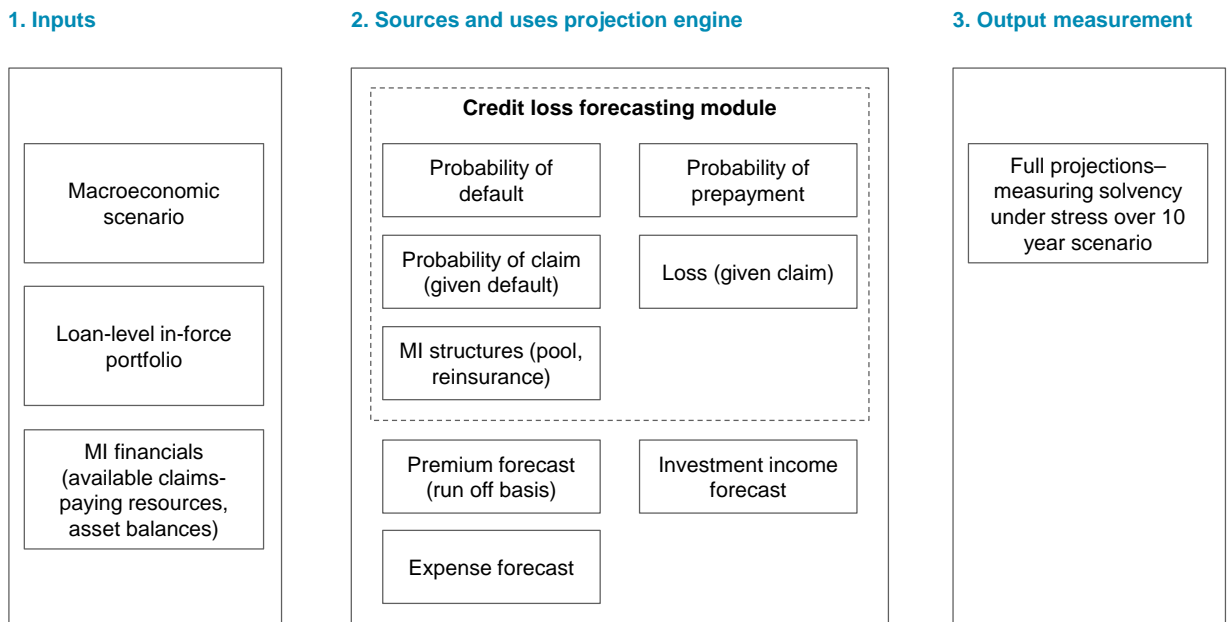
The loan level capital model framework is based on the following key underlying assumptions:

- Identifiable statistical and macroeconomic drivers of past mortgage default incidence are indicative of future performance and will continue to be predictive in the future
- Probability of Default model component assumes that projected default rate components for unseasoned loans are explained by borrower and loan characteristics as of loan origination and forecasted macroeconomic drivers
- Probability of Prepayment model component assumes no capture of partial payments except where an accelerated payment schedule leads to cancellation of coverage driven by non-refinance activity
- Loss Given Default model component assumes each default is an independent occurrence and not affected by the outcome of any previous defaults experienced by the borrower

4. Loan Level Methodology – Overview

The overall framework of the loan level capital model adopted by the mortgage insurance industry encompasses the following components, as summarized under the Capital Model Components Overview.

Capital Model Components Overview



The above capital framework encompasses the following major functions:

a. *Claims Paying Resources and Other Input Capture*

The capital framework begins by capturing a set of inputs, which include the MI financial statement capture of claims paying resources and income generating assets, a snapshot of the loan level in-force portfolio and a macroeconomic stress scenario. Each U.S. mortgage insurer's (MI) legal entities are consolidated for purposes of calculating solvency including the loan portfolio for which credit losses are estimated, as well as other assets and liabilities.

b. *Sources and Uses of Capital Projection*

The above inputs are fed through a sources and uses of capital projection system, which generates forecasts of credit losses, composed of the probability of loan default, prepayment, claim given default and loss given claim, premium income for the in-force loan portfolio, investment income and expenses, resulting in a set of expected cash flows over a ten year stress scenario.

Credit losses for a given loan in-force are forecast by:

- Loan projection over the capital model's ten year projection period
- Dynamic loan level characteristics update over the projection horizon consistent with the macroeconomic scenario, including loan age, current LTV, scheduled Homeowners Protection (HPA) cancellation and loan refinance incentives
- Projected macroeconomic paths, including home price index, unemployment rates and interest rates
- Projected loan level path scoring using the probability of competing hazards derived from the default and prepayment models to estimate the percentage of in-force balances in a given period expected to default or prepay
- Cumulative probability projection that a loan will remain in-force until a given projection period along with expected in-force balances, given the cumulative survival probability, and the expected default and prepayment balances consistent with the loan's expected survival profile
- Loss given default model calculation of the expected claim amount in the current and subsequent years for projected defaulting balances

c. *Capital Solvency Measurement*

The solvency module assesses whether starting capital resources are sufficient to survive a given stress scenario based on available resources and projected cash flow.

A further description of the individual components within the above Capital Model Components Overview follows.

5. Loan Level Methodology – Claim Payment Resources

The loan level capital model input capture module utilizes MI financial statements to estimate available capital resources as well as assets and expenses, as summarized under the following Components of Starting Available Claims Paying Resources.

Components of Starting Available Claims Paying Resources

| Starting capital component | Comments |
|--|---|
| + Surplus as regards policyholders | Source: annual statement, P3, L37, C1 |
| + Loss reserve | Source: annual statement, P3, L1, C1 |
| + Statutory contingency reserve | Source: annual statement, P3, L2501, C1 |
| + Unearned premium reserve | Source: annual statement, P3, L9, C1 |
| + Legally binding contingent capital | As specified by MI |
| - Haircut to investments in subsidiaries | Unconsolidated affiliates (i.e. US non-MI entities or non-US entities), are treated as investments in the model, and subject to a haircut when calculating starting available capital resources |
| = Total available capital resources | |

MI's provide a breakdown of assets to facilitate estimates of the percentage of starting claims paying resources necessary to satisfy asset risk capital requirements. MI available claims paying assets are subject to an underlying credit risk and accordingly are subject to a "haircut" based on invested asset risk based capital multipliers used for P&C RBC calculations. Asset classes and applicable "haircuts" are calculated in accordance with the following Haircuts Applied to Claims Paying Assets to Reflect Credit Risk Capital.

Haircuts Applied to Claims Paying Assets to Reflect Credit Risk Capital

| Asset Class | Components | Capital requirement |
|---------------------|---|--|
| Unaffiliated bonds | Bonds by NAIC risk class 1-6 (ratings-driven) | Factors = 0.0-0.3 depending by class Size factor charge, based on number of portfolio issuers |
| Unaffiliated equity | Preferred stock (class 1-6) | Factors by class, as with bonds |
| | Hybrid securities (class 1-6) | Factors by class, as with bonds |

| | | |
|-----------------------------|---|---|
| | Non-government money market funds | Uniform factor = 0.003 |
| | Common stock | Uniform factor = 0.15 |
| Asset concentration | Unaffiliated bonds Unaffiliated equity | Base capital doubled for fixed-income and equity assets for top 10 name-level issuers |
| Other long term assets | Real estate | Typically NA for MIs |
| | Mortgages | Typically NA for MIs |
| | Other long term assets (sch. BA) | Uniform factor = 0.2 |
| Misc. assets | Receivables for securities | Uniform factor = 0.05 |
| | Aggregate write-in for invested assets | Uniform factor = 0.05 |
| | Cash and equivalents | Uniform factor = 0.003 |
| | Short-term investments | Uniform factor = 0.003 |
| | Collateral loans (admitted) | Uniform factor = 0.05 |
| Credit risk for receivables | Reinsurance recoverables | Uniform factor = 0.1 |
| | Other receivables | Factors = 0.05-0.1, depending on sub-category |

6. Loan Level Methodology – Macroeconomic Scenario Parameters

The capital model input capture module also generates a set of projected macroeconomic paths, which consist of the following key drivers or variables which are used to forecast a stress scenario.

a. Home Price Index (HPI) Scenario

The capital model utilizes the FHFA Home Price Index based on MI familiarity with this index for internal analytics and the concentration of GSE mortgages in MI portfolios. The HPI is the primary macroeconomic driver of default frequency, loss and prepayment rates.

Key components of this Home Price Index path include the following:

- Trend Granularity – models the HPI based on regional versus high level national or very detailed MSA census level experience based on regional differences noted during the mortgage crisis

- Trend Approach – normalizes the HPI trend based on the Per Capita Income (PCI) or average income based on the expectation that home prices remain stable relative to income levels
- PCI Forecast – projects PCI forward based on Moody’s S4 severely adverse scenario, based on similarities with the recent economic downturn
- Trough Granularity – forecasts the low point or trough, the amount by which home prices are expected to drop below trend under financial stress, by applying the largest national trough experienced consistently to each region
- Trough Approach – sets the trough or how far the process can go below trends based on application of national level data experienced consistently across all regions under the assumption all MI firms tend to maintain a nationally diversified mortgage portfolio
- Path to Trough – forecasts average peak to trough direction based on a 10 year projection period encompassing a 3 year decline, a 4 year static period and a 3 year increase based on estimates that a 3-4-3 path reflects the average maturity across regions
- Mark to Market Dispersion – establishes a dispersion multiplier based on regional mark to market multiplier to reflect a less granular home price path
- Minimum Threshold – caps the home price decline from actual to trough after 3 years at 0%

b. Unemployment Rate Scenario

The capital model uses the U.S. national unemployment rate available from the U.S. Bureau of Labor Statistics. The above U.S. national unemployment rate was chosen as the variable most representative of the broader economic conditions facing US consumers. The unemployment rate is input to both the probability of default and loss given default modules, reflective of the likelihood of the potential for increasing default under periods of unemployment and economic downturn.

The unemployment rate path utilized is a fixed target level with a minimum absolute increase from the unemployment rate as of a given snapshot date, based on the following Unemployment Rate Scenario Parameters.

Unemployment Rate Scenario Parameters

| Component | Specification |
|--|--|
| Unemployment series used | US unemployment rate, annual average |
| Target unemployment rate level | 10% |
| Annual rate of increase to target | 3% (absolute) |
| Minimum increase in unemployment rate | 3.5% (absolute) |
| Annual rate of decrease after target | 0.7% (absolute) |
| Minimum unemployment rate following recovery | Projected natural rate of unemployment |

c. Interest Rate Scenario

The capital model also projects U.S. Treasury interest rates as part of its stress scenario. The prepayment model component utilizes interest rate projections to estimate the level of prepayment incentive. The investment income model component utilizes interest rate projections to estimate yield assumptions for the long-term bond and short-term investments. Interest rate projections in a stress scenario are generally expected to remain at relatively low levels in years 1-7 of the projection, while years 8-10 reflect recovery.

Interest rate projections are completed to provide capital model parameters based on the following treasury security maturities:

- 3 month
- 1 year
- 2 year
- 3 year
- 5 year
- 10 year

7. Loan Level Methodology – In-Force Portfolio

The capital model input module also captures the loan level in-force portfolio as of given snapshot date. The loan level portfolio serves as the starting point for projecting portfolio performance through the macroeconomic cycle.

The portfolio snapshot consists of loan level origination characteristics, or static data, as well as dynamic loan level performance history. The loan level snapshot is generated based on creation of consolidated MI files, which standardizes each company's unique data formats into a common format used by the capital model.

8. Loan Level Methodology – Probability of Default Forecast

The probability of default capital model estimates the probability that loans will default based on a set of variables for each loan. Loan default is defined to include any of the following:

- Loan is 6 months (180 days) or more past due
- Insurance claim is paid against the loan coverage
- Insurance claim against loan coverage is denied
- Insurance coverage is rescinded

The capital model treats rescission and denials as defaults based on the theory that they should not project loss relief, since such activity is expected to be curtailed going forward primarily as a result of master policy restrictions imposed by the GSEs.

Key loan default variables include the following:

a. Loan Type Segmentation

Each loan in-force as of the snapshot date is assigned to a unique loan type segment based on age and performance history based on the following PD Model Segmentation Table.

PD Model Segmentation

| Segment | Snapshot Age | Performance as of Snapshot |
|----------------|---------------------|--|
| Unseasoned | <=12 months | Any |
| Performing | > 12 months | Performing as of snapshot; not delinquent in past five years |
| Blemished | > 12 months | Performing as of snapshot; delinquent (including defaulted) in past five years |
| Delinquent | > 12 months | Delinquent as of snapshot (payments past due >0) |

b. Loan Level Characteristics

Various loan origination characteristics, dynamic ongoing loan characteristics and macroeconomic variables determined to be best correlated with the above loan segments, are evaluated, including:

- Loan Origination Characteristics
 - Credit score
 - Product type
 - Loan purpose
 - Property use
 - Number of borrowers
- Ongoing Loan Characteristics
 - Current LTV
 - Current or previous delinquency
- Macroeconomic Variables
 - Change in home price index
 - Change in unemployment rate

Each of the above default modeling segments uses a different logistic regression equation to forecast the conditional annual default rate.

c. Underwriting Quality

The ability to capture the impact of underwriting quality in conjunction with the projection of loan default is provided by a “proxy” variable for industry underwriting quality, which is based on a numerical scorecard for each quarterly loan origination

vintage. This underwriting score consists of the sum of various non-standard underwriting characteristics, including:

- LTV > 90% or 95%
- Incomplete loan documents
- Loan purpose = refinance or cash out refinance
- Loan type = interest only or negative amortization loan
- Property type = condominium or non-primary residence
- Third party loan origination
- Loan term = 15 year mortgage

9. Loan Level Methodology – Probability of Prepayment Forecast

The prepayment capital model estimates the probability of prepayment based on a set of variables for each loan including:

a. Product Segmentation

Each loan in-force as of the snapshot date is assigned to a unique product type segment based on the underlying mortgage instrument type and lifecycle phase in accordance with the following Prepayment Model Segmentation Table.

Prepayment Model Segmentation

| Segment | Loan characteristics |
|----------------|---|
| Fixed | Fixed-rate mortgage instrument type |
| Hybrid | Hybrid mortgage instrument type Loan is within the initial fixed phase of lifecycle, as indicated by months on book elapsed and length of initial period before first reset |
| Floating | Hybrid or ARM mortgage instrument type If hybrid, loan is within the floating phase of lifecycle, as indicated by months on book elapsed and length of initial period before first reset |

b. Loan Level Characteristics

Various loan origination, dynamic ongoing loan characteristics and macroeconomic variables determined to be best correlated with the above loan segments are evaluated, including:

- Loan Origination Characteristics
 - Credit score
 - Loan purpose

- Property type
- Loan document completeness
- Current or previous delinquency or default
- Ongoing Loan Characteristics
 - Loan to value
 - Loan age
 - Current or previous delinquency or default
- Macroeconomic Variables
 - Change in home price index
 - Refinance interest rate incentives

Each of the above prepayment modeling segments uses a different logistic regression equation to forecast the conditional annual prepayment rate, given differences in refinance incentives by product type.

The incentive to prepay is typically motivated by the ability to refinance a loan at a market rate which is more attractive than the current interest rate paid by the borrower. Mortgage rates used as a proxy within the module include the following based on the above product type segments.

- Fixed = 10 year treasury rate
- Hybrid = Treasury rate closest to the length of the fixed portion
- Floating = Current floating market rates (1 year treasury + 2.75%)
Comparison to refinance lock-in rates (10 year treasury + 1.75%)

Automatic cancellation of coverage forms the typical alternative to prepayment for non-defaulted cancelling loans under provisions of the Homeowners Protection Act of 1998. Homeowners Protection Act cancellations are required for loans based on amortized schedule loan to value as well as months on the books elapsed relative to the overall loan term. The schedule year of cancellation is estimated for each loan based on the applicable provisions under the above requirements.

Cancelled loans are separated into “prepayments” or “non-prepayments” depending on the timing of cancellation relative to the estimated scheduled year of cancellation. Loans cancelling within one year of the estimated scheduled date are not treated as prepayments. Loan cancellations more than one year before, or more than one year after the scheduled date are treated as prepayments.

10. Loan Level Methodology – Loss Given Default Forecast

The loss given default capital model estimates the projected loss experience in the event that a loan defaults. Loss given default is modeled in two stages based on the following estimations:

a. Default Loan Transition to Post Default Outcomes

The probability that a default loan would transition to one of following post default outcomes over time is estimated, based on regression analysis which captures loan performance starting from the point of default through final outcome, including:

- **Cure** – based on a loan returning to a performing status for two years following a default without loss
- **Cancel** – based on borrower equity and collateral recovery sufficient to make the investor whole without filing of a claim or loss
- **Claim** – based on either MI payment of the total claims amount and subsequently taking title to the property or payment of the coverage limit and leaving title with the insured

Outcomes are modeled through five years following default. Expected unresolved balances after 5 years are moved to claim status. Post default modifications are excluded from the model given the challenges in estimating future modification incidence and impact.

Cured loans which subsequently re-default are accounted for by a multiplier applied to the projected cures based on historical experience.

Key variables included in the loss given default model include the following:

- Loan Origination Characteristics
 - MI coverage level
 - Non-standard product
- Ongoing Loan Characteristics
 - Current loan to value
 - Loan age at default
 - Time elapsed since default
- Macroeconomic Variables
 - Change in home price index
 - Change in unemployment

b. Credit Loss Modeling for Claims Made

Credit loss for corresponding claims made balances are estimated based on:

- Fixed multiplier of expected risk in-force at the time of default for coverages under 40%
- Borrower obligation at default and expected recoveries given LTV at the time of default for coverages deeper than 40%

11. Loan Level Methodology – MI Structures

Loan level events and cash flow are aggregated by pool and reinsurance structures. Cumulative events and losses are compared to structural features, such as deductibles, aggregate loss limits and ceded premiums and losses, to determine net premium and losses faced by the insurer.

12. Loan Level Methodology – Premium Income Forecast

Premium Income is forecast at a loan level based on the following loan premium payment types:

a. Single Payment

No premium is projected since the MI is presumed to have received all premium funds and incorporated them in starting available claims paying resources including unearned premium reserves.

b. Monthly / Annual Payment

Constant renewal premiums are projected as a function of the premium rate and the origination UPB of the underlying loan.

Amortizing renewal premiums are projected as a function of the premium rate and amortized UPB as of given projection period.

Refunds are projected using the Wisconsin schedule of premium refunds, where the percentage of premium refunded is a function of a loan's origination LTV, original amortization term and age at time of cancellation.

13. Loan Level Methodology – Investment Income Forecast

Investment income on MI assets is projected using simplified yield projections consistent with the starting level of claims paying assets and the cash flows over the course of the ten year projection period. Portfolio distribution is assumed to remain constant over the course of the projection period and distributed based on portfolio class mix at loan origination.

Classes of unaffiliated investments and the related capital model forecast approach include the following.

a. Long-Term Bonds

Investment income on long-term bonds is projected based on the assumption of reinvestment of maturing balances at a constant spread in accordance with the underlying portfolio maturity profile and a projected interest path.

b. Cash and Short-Term Investments

Investment income on cash and short-term investments is forecast based on projected short-term investment balances as a constant share of the overall investment portfolio and estimated yields based on the 3 month treasury rates.

c. Equity Investments

Income on unaffiliated equity investments is forecast based on a projected constant share of equity investments in the overall investment portfolio and estimated yields based on the MI's historical yield experience on equity assets.

d. Other Invested Assets

Income on other invested assets is forecast based on a projected constant share of other invested assets in the overall portfolio and estimated yields based on the MI's historical yield experience.

14. Loan Level Methodology – Expense Forecast

MI expenses are projected based on the following components.

a. Loss Adjustment Expense (LAE)

Loss adjustment expense related to claims processing is estimated based on the relatively constant ratio to losses projected for the previous two years.

b. Expenses Other Than LAE (EOLAE)

Expenses other than LAE are projected as a constant function or ratio of projected premiums earned for the MI book of business.

15. Loan Level Capital Model Conversion to RBC

The Risk Based Capital (RBC) grids were derived from the loan level capital model based on the following process:

a. Key Risk Attribute Identification

Key risk attributes in addition to LTV and credit score from the loan level model were identified for capture in the multipliers under the RBC grid approach.

b. Variable Risk Attribute Determination

Variable buckets for various continuous risk characteristics such as underwriting quality were identified.

c. Loan Sample Development

A loan sample representative of all portfolio types and baseline risk characteristics was selected for review.

d. *Claims and Premium Forecast Estimation*

Claims and premiums were forecasted for the above loan sample using prescribed home price drops for each grid.

e. *Multiplier Determination*

Multiplier size was determined based on the sensitivity of capital to the factor in the loan level model.

The above process resulted in the development of a set of LTV/Credit Score grids approximating the capital required under the loan level capital model.

VIII. OTHER MORTGAGE GUARANTY INSURANCE MANDATED REQUIREMENTS

A. Underwriting Standards - Documentation and Approval Considerations

Overall mortgage guaranty insurance company underwriting standards are documented in the Mortgage Guaranty Insurance Model Act under Section 11. The following considerations constitute additional requirements mandated by the Mortgage Guaranty Insurance Act. These and other requirements under Section VIII may be modified from time-to-time by the NAIC Mortgage Guaranty Insurance Working Group, in accordance with NAIC prescribed procedures.

Mortgage guaranty insurer establishment of the underwriting documentation and approval requirements outlined in the Mortgage Guaranty Insurance Model Act (Section 11 E) shall include the following additional considerations based on the appropriateness in relation to the size and status of the mortgage guaranty insurer's organization and loan environment:

1. Lender Loan Submission Requirements

Loan submission shall include identification of requirements for loan application processing under scenarios involving both:

- a. Loan document submission by loan originators to the mortgage guaranty insurer; and
- b. Electronic submission of summary loan data without documents.

2. Loan Documentation and Underwriting Compliance Evaluation Responsibilities

Loan documentation and underwriting evaluation responsibilities shall include but not be limited to the following:

- a. Lender responsibilities for loan data entry accuracy and providing loan documentation supporting the loan file information submitted electronically;
- b. Mortgage guaranty insurer's responsibilities for verifying loan data entry accuracy and compliance with loan submission procedures;
- c. Automated underwriting systems reliance for verification of loan underwriting decisions and compliance with loan document and electronic submission procedures;
- d. Lender obligations to provide underlying loan documents based on subsequent mortgage guaranty insurer request; and
- e. Mortgage guaranty insurer and insured's rescission rights and responsibilities to demonstrate transparency in accordance with Section 16.

3. Minimum Mortgage Documentation Standards

Mortgage documentation standards shall include but not be limited to:

- a. Loan application;
- b. Mortgage insurance application;

- c. Credit history reports and sources;
- d. Borrower income verification and sources;
- e. Borrower employment verification;
- f. Property appraisal reports;
- g. Mortgage note evidence of indebtedness; and
- h. Commitment certificate.

4. Loan Program or Type Qualification Requirements

Loan program qualification requirements shall include but not be limited to:

- a. Loan purpose;
- b. Property type;
- c. Maximum loan to value;
- d. Maximum loan terms;
- e. Maximum loan amount;
- f. Minimum credit score under any credible scoring system; and
- g. Maximum debt to income ratio.

5. Minimum Borrower Repayment Qualification Requirements

Borrower repayment requirements shall include but not be limited to:

- a. Borrower's credit history;
- b. Borrower's sources of funds;
- c. Borrower's credit score under any credible scoring system;
- d. Borrower's debt to income ratio; and
- e. Borrower's down payment.

6. Minimum Property Marketability Qualifications

Property marketability requirements to support the reasonableness of the mortgaged property's valuation shall take into account:

- a. Marketability, as demonstrated by property appraisals for comparable properties or other equivalent comparisons; and
- b. Valid property title, as demonstrated by title insurance or other equivalent legal opinion or state coverage programs at time of claim settlement.

B. Quality Assurance Standards

Overall mortgage guaranty insurance company quality assurance standards are documented in the Mortgage Guaranty Insurance Model Act under Section 12. A quality control program provides the organization with feedback, which can be used by management to establish or modify company loan origination policies and procedures. The following considerations constitute additional requirements mandated by the Mortgage Guaranty Insurance Model Act.

All mortgage guaranty insurers shall establish a Mortgage Guaranty Quality Control Program in accordance with Model Act (Section 12), which addresses the following additional considerations, as adjusted to the size and status of the insurer's organization and mortgage guaranty environment.

1. Segregation of Duties

Persons who administer the quality control program or perform related compliance testing shall be prohibited from engaging in activities related to loan origination, pricing, underwriting and operations, which create a potential conflict of interest and impact reviewer independence. This requirement does not apply to the highest level of senior management responsible for enterprise risk management.

2. Senior Management Oversight

Management shall appoint an appropriate internal senior management level committee to provide internal oversight as it relates to ongoing review of Quality Control Program compliance, exception findings, recommendations and corrective action.

3. Board of Director Oversight

The board of directors shall designate the board's audit or other appropriate committee responsibilities for providing external oversight as it relates to ongoing review of Quality Control Program compliance, exception findings, recommendations and corrective action.

4. Policy and Procedures Documentation

Mortgage Guaranty Quality Control Program policies and procedures shall be formally established and documented, and shall include but not be limited to:

- a. Organizational responsibilities;
- b. Program objectives and purpose;
- c. Management underwriting performance objectives and targets;
- d. Scope of quality control review;
- e. Sampling methodology representative of loan origination environment;
- f. Frequency of reviews;
- g. Management and board of director oversight roles;
- h. Reporting levels and scope; and
- i. Corrective action requirements

5. Underwriting Risk Reviews

Quality control review shall include an examination of underwriting risk including categorization of the insurer's exposure and compliance with risk tolerance levels associated with:

- a. Mortgage type;
- b. Loan to value;
- c. Credit score;
- d. Debt to income;
- e. Geographic region; and
- f. Restricted market targets.

6. Lender Performance Reviews

Quality control monitoring provisions shall include an assessment of lender performance expectations including:

- a. Lender underwriting volumes and trends; and
- b. Lender exception volume, recommendations and solutions.

7. Underwriting Performance Reviews

Quality control monitoring provisions shall assess underwriting guidelines compliance based on:

- a. Loan documentation compliance review;
- b. Selective verification of original loan data relied on including borrower income and employment status;
- c. Loan approvals outside of mortgage guaranty insurer authority limits;
- d. Mortgage guaranty insurer underwriter exception volumes; and
- e. Declined loan compliance.

8. Problem Loan Trend Reviews

Quality control monitoring provisions shall assess prospective risks related to potential future loss impact trends associated with:

- a. Delinquency;
- b. Foreclosure;
- c. Default Inventory; and
- d. Persistency.

9. Underwriting System Change Oversight

Quality Control procedures shall include a review of system and program change controls

for compliance with user testing and signoff over key changes which impact automated underwriting system decision making.

10. Pricing and Performance Oversight

Quality Control shall monitor loss trends by business segment for reasonable alignment with related premium schedules to ensure pricing adequacy.

11. Internal Audit Validation

Internal audit shall periodically review overall compliance with the Mortgage Guaranty Quality Control Program requirements, if it is not directly responsible for such program execution.

12. Regulator Access

The regulator of the state of domicile shall review the insurer's Mortgage Guaranty Quality Control Program for indicators of critical risk exposure and reliance in conjunction with cyclical examinations.

C. Records Retention Standards

Overall mortgage guaranty insurance company record retention requirements are set forth in Section 17 of the Mortgage Guaranty Insurance Model Act. The following record retention related considerations constitute additional requirements mandated under the Mortgage Guaranty Insurance Model Act.

1. Records Retention Requirements

a. Policy Records

Policy record retention requirements shall include the following:

- Application and accompanying records for each certificate, which clearly identify the producer involved in the transaction;
- Declaration pages, master policy and certificates evidencing coverage, any endorsements or riders associated with a master policy and any written or electronic correspondence to or from the insured pertaining to the coverage;
- Guidelines, manuals or other information necessary for the reconstruction of the rating, underwriting policy servicing and claims handling of the certificate (Maintenance of an on-site copy of a market conduct examination of each of the above shall satisfy this requirement); and
- Declined underwriting files or expired certificates for the current year plus the three (3) preceding calendar years which includes the related:
 - Application
 - Documentation substantiating the decision to decline certificate issuance
 - Documentation substantiating the decision not to add additional or reinstate coverage when requested
 - Termination, rescission or application denial notifications required by law

b. Claims Records

Claim files shall be maintained which clearly document the inception, handling and disposition of each claim to permit reconstruction of pertinent events and dates, including the following:

- Files containing the notice of claim, claim forms, proof of loss, other forms of claim submission and claim acknowledgment;
- Documents submitted in support of a claim and any documentation demands;
- Claim investigation documentation;
- Correspondence to and from the insureds or their representatives or agents relating to the handling, payment or denial of the claim;
- Documented or recorded telephone communications related to the handling of claim payment or denial;
- Copies of claim checks or drafts;
- Subrogation and salvage documentation;
- Other documentation created or maintained in a paper or electronic format necessary to support claim handling activity; and
- Claim manuals or other information necessary for reviewing the claim.

2. Retention Period

The above policy and claim records shall comply with the retention periods of the Mortgage Guaranty Insurance Model Act, unless applicable law establishes a different retention period.

3. Record Format

Record retention format shall conform with the following detailed guidelines:

a. Template Requirements

Documents produced or sent an insured by use of a template and an electronic mail list shall be considered to be sufficiently reproduced if the insurer can provide proof of document mailing and a copy of the template.

b. Signature Requirements

Documents requiring the signature of the insured shall be maintained in any format listed in the Model Act provided evidence of the signature is preserved in that format.

c. Archive Requirements

Maintenance of records in a computer-based format shall be archived so as to preclude the alteration of the record after initial transfer to a computer format. Records created electronically or in a computer-based format may be maintained in their original format.

d. Examination Requirements

All records shall be available and as legitimate as the original hard copy or another medium for examination review in whatever reasonable form, interval, time or manner designated by the commissioner.

e. Reproduction Requirements

Photographs, images, microfilms, microfiche, or other image processing reproductions of records shall be equivalent to the originals and may be certified as the same in actions or proceedings before the commissioner unless inconsistent with (insert citation to administrative proceedings law), as applicable.

f. Retention Procedure Requirements

Records shall be maintained according to written procedures developed and adhered to by the insurer and made available to the commissioner upon request during an examination.

4. Records Maintenance

Insurer records maintenance shall comply with the applicable Model Act location accessibility and related third-party contractual requirements.

D. NAIC State Regulatory Mortgage Insurer Capital Standard

The NAIC State Regulatory Mortgage Insurer Capital Standard is mandated by Section 7 of the Mortgage Guaranty Insurance Model Act. The following is a description of the sequence of operations and tables of factors to be used in the computation of the NAIC State Regulatory Mortgage Insurer Capital Standard mandated under the Mortgage Guaranty Insurance Model Act. This section provides a description of how the State Regulatory Mortgage Insurer Capital Standard is calculated. For an explanation of why the State Regulatory Mortgage Insurer Capital Standard was designed as it is, see Section VII.

1. Overall Sequence of Operations to Arrive at the NAIC State Regulatory Mortgage Insurer Capital Standard

- a. Step 1 – Calculate the Risk-Modeled Ultimate Loss for each insured loan.
- b. Step 2 – Aggregate the Risk-Modeled Ultimate Loss for each insured loan outstanding by Book Year.
- c. Step 3 – Apply the appropriate seasoning factor to the Risk Modeled Future Loss for each Book Year.
- f. Step 4 – Calculate and subtract risk ceded through reinsurance by Book Year.
- g. Step 5 – Calculate and add the margin for expense by Book Year.
- h. Step 6 – Calculate and subtract the premium credit by Book Year.
- i. Step 7 – Aggregate the results of Steps 1 through 6 for the past twenty Book Years.
- j. Step 8 – Add 10% of the risk in force on Pool Mortgage Guaranty Insurance.
- k. Step 9 – Add 5% of the risk in force on reinsurance assumed.
- l. Step 10 – Subtract the single premium credit to obtain the State Regulatory Mortgage Insurer Capital Standard as of the effective date of the calculation.

- m. Step 11 – Compute Total Adjusted Capital.
- n. Step 12 – Divide Total Adjusted Capital by the State Regulatory Mortgage Insurer Capital Standard to determine applicability of regulatory action.

2. Step 1 – Calculate the Risk-Modeled Ultimate Net Loss for Each Insured Loan

The Risk-Modeled Ultimate Net Loss is individually computed for each insured loan by combining the capital standard factors as shown in the following formula:

$$\text{SRMICS Capital Factor} = \frac{e^b}{1+e^b}, \text{ where } b = \ln\left(\frac{\text{base rate}}{1-\text{base rate}}\right) + \ln(\text{FICO Factor}) + \ln(\text{LTV Factor}) + \ln(\text{alternative risk factor}) + \ln(\text{high risk factor}) + \ln(\text{risk offset factor}) + \ln(\text{economic risk factor})$$

a. State Regulatory Mortgage Insurer Capital Standard Factors

The table below provides a summary of the factors:

| Model Factor | Description | Level | Value |
|---|--|---|--|
| Base Factor | Base factor applied to all mortgages | N/A | 0.55% |
| FICO Score | Borrower credit score at origination | 760-850 740-759 720-739 700-719 680-699 660-679 640-659 620-639 600-619 580-599 560-579 300-599 Missing / Error | 1.00 1.35 1.60 1.95 2.40 2.90 3.55 4.40 5.50 6.60 7.60 9.50 5.00 |
| Loan-to-Value Ratio | Loan-to-value ratio at origination | (0, 80] (80, 85] (85, 90] (90, 95] (95, 100] 100+ Missing | 1.00 1.45 1.75 2.00 3.05 4.00 2.00 |
| Number of Alternative Risk Factors | Total number of Alternative Risk Factors on the mortgage | 0 1 2 3 4+ | 1.00 1.30 1.65 1.90 2.00 |
| Number of High Risk Factors | Total number of High Risk Factors on the mortgage | 0 1 2 3 4 | 1.00 1.50 2.35 2.95 3.25 |
| Number of Risk Offset Factors | Total number of Risk Offset Factors on the mortgage | 0 1 2 3 | 1.00 0.65 0.50 0.50 |
| Economic Factor | Economic adjustment factor evaluated at origination | Varies by origination year | |
| Severity Rate | Severity rate, as a percent of original loan amount, applied to mortgage insurance coverage in excess of Standard Coverage | Varies by the Economic Factor | |

b. Base Factor

The base factor for all loans is 0.55.

c. FICO Score Factor

The appropriate FICO score factor is selected based on the FICO score for the mortgage loan at origination.

c. Loan-to-Value Ratio Factor

The appropriate FICO score factor is selected based on the loan-to-value ratio for the mortgage loan at origination.

d. Alternative, High, and Offsetting Risk Factors

Calculation of these factors is simply a matter of noting how many of each of the alternative, high, and offsetting factors apply to a mortgage loan and applying, in each instance, the appropriate factor from the table of Section VIII(D)(2)(a). The table below provides a list of the alternative, high, and offsetting risk factors.

| Alternative Risk Factors | High Risk Factors | Risk Offset Factors |
|---|--|--|
| Loan purpose other than Purchase | Not full documentation | More than one borrower |
| Property type other than Single Family Residence | Interest only or other non-fully amortizing loan | Original loan term is less than or equal to 240 months |
| Greater than 360 month amortization term | Occupancy Type other than Primary | Loan originator is a credit union |
| Amortization type other than fixed | Back-end DTI above 50% | |
| Back-end DTI greater than 43% and less than or equal to 50% | | |

e. Economic Factor

The economic factor is measured using two economic data series: per capita income and the FHFA conventional and conforming home price index. The model compares the rolling four-year change in income relative to the four-year change in home prices. The difference in the 4-year change between home price growth and income is applied to an equation to develop the Economic Factor. The specific equation is:

$$RBC \text{ Capital Factor} = \text{Max}(1, \min(20, e^{5x})), \text{ where } x = \text{percentage difference in 4-year change between home price appreciation and per capita growth measured at the State level}$$

The data used for the calculation is performed on a state-level basis using data that is publicly available. State-level income data is published with a one-year lag. That is, 2018 income data would not be collected and published until 2019. The state-level FHFA conventional and conforming home price index data is available quarterly, but revisions to the data are likely and

to be expected. Accordingly, a balance must be struck between timeliness and accuracy. For purposes of the State Regulatory Mortgage Insurer Capital Requirement, a two-quarter lag is used; that is, in completing a calculation of the capital standard as of any December 31st, one would use the applicable home price index data as of June 30th of that year.

f. Severity Factor

The severity factor is calculated for each individual mortgage loan at the time of origination. It is a function of the original loan-to-value ratio of the mortgage loan and the Economic Factor. The higher the original loan-to-value ratio of the mortgage, the greater the severity rate. The higher the Economic Factor, the higher the severity rate. The severity rate, expressed as a percentage of the original loan amount, is a linear function of the economic factor and the intercept is set by the original loan-to-value ratio. The equation below describes the calculation of the severity rate.

$$\text{Severity Rate} = \text{Intercept} + \text{Slope} * \text{Economic Factor}$$

The tables below provide the intercept and slope of the function required to calculate the severity rate.

| Original loan-to-value Ratio | Intercept | Slope |
|------------------------------|-----------|-------|
| (0, 10] | 0.100 | 0.02 |
| (10, 20] | 0.100 | 0.02 |
| (20, 30] | 0.100 | 0.02 |
| (30, 40] | 0.150 | 0.02 |
| (40, 50] | 0.200 | 0.02 |
| (50, 60] | 0.250 | 0.02 |
| (60, 70] | 0.300 | 0.02 |
| (70, 80] | 0.350 | 0.02 |
| (80, 85] | 0.375 | 0.02 |
| (85, 90] | 0.400 | 0.02 |
| (90,95] | 0.425 | 0.02 |
| 95+ | 0.450 | 0.02 |

3. Step 2 – Aggregate the Risk-Modeled Ultimate Loss for each Insured Loan Outstanding by Book Year

The results of the individual computations of the Risk-Modeled Ultimate Net Loss for each insured mortgage loan outstanding as of the December 31st the calculation is made are aggregated by Book Year for the current calendar year and the nineteen calendar Book Years preceding the current one. The fact that only insured mortgage loans currently outstanding are included means that this figure for each Book Year is the Risk Modeled Future Loss of each Book Year. Except for Pool Mortgage Guaranty Insurance and assumed reinsurance, which are addressed separately in Steps 8 and 9, any Risk Modeled Future Loss for Book Years earlier that the nineteen preceding the current one are disregarded.

4. Step 3 – Apply the Appropriate Seasoning Factor to the Risk Modeled Future Loss for Each Book Year

There is a seasoning factor applied to each of the twenty Book Years that adjust the Risk-Modeled Future Loss, which is based on the length of time a loan has remained on the mortgage insurer’s books, to recognize that aged loans are typically less risky, more stable and have less exposure to catastrophic risk. The following table provides the seasoning factors to be applied to each of the twenty Book Years:

| Book Year | Seasoning Factor |
|--|-------------------------|
| Current and prior calendar Book Years 1 to 3 | 1.00 |
| Prior calendar Book Year 4 | 0.90 |
| Prior calendar Book Year 5 | 0.85 |
| Prior calendar Book Year 6 | 0.80 |
| Prior calendar Book Year 7 | 0.75 |
| Prior calendar Book Years 8 to 19 | 0.70 |

5. Step 4 – Calculate and Subtract Risk Ceded through Reinsurance by Book Year

Credit for ceded reinsurance will be allowed if the mortgage guaranty insurance company can show, through appropriate documentation filed with its State Regulatory Mortgage Insurer Capital Standard Report, that reinsurance would apply to the Risk Modeled Future Loss, as adjusted by the seasoning factor, for a particular Book Year. The risk ceded for each Book Year will then be aggregated in total. Risk ceded through reinsurance for each Book Year would be subtracted from the capital that would otherwise be required. This is done by subtracting the aggregate credit for reinsurance ceded from the aggregate Risk Modeled Future Loss, as adjusted by the seasoning factors for the various Book Years.

6. Step 5 – Calculate and Add the Margin for Expense by Book Year

The margin for expense is set at 1% of risk in force. While premium rates charged vary depending on the underwriting characteristics of the risk and with market conditions, this margin for expense is roughly equivalent to 10% of direct premium written. The margin for expense will be calculated for each Book Year and then aggregated in total.

7. Step 6 – Calculate and Subtract the Premium Credit by Book Year

A credit equal to two years of run-off premium by book year is allowed and this amount is subtracted from the capital that would otherwise be required. At this stage, only monthly premium policies and certificates are included.

8. Step 7 – Aggregate the Results of Steps 1 through 6 for the Past Twenty Calendar Book Years

The results of the following Book Year computations are aggregated for the twenty calendar years preceding the December 31st date as of which the calculation is made:

Risk-Modeled Future Loss; Risk-Modeled Future Loss adjusted for Seasoning; Company Estimated Ceded Reinsurance; Margin for Expense; and Premium Credit.

9. Step 8 – Add 10% of the Risk In-Force on Pool Mortgage Guaranty Insurance

There is a 10% capital charge for the risk in force on Pool Mortgage Guaranty Insurance, which is added to the overall capital requirement.

10. Step 9 – Add 5% of the Risk In-Force on Reinsurance Assumed

There is a 5% capital charge for the risk in force on assumed reinsurance, which is added to the overall capital requirement.

11. Step 10 – Subtract Single Premium Credit to Obtain the State Regulatory Mortgage Insurer Capital Standard

A premium credit is permitted for single premium policies and certificates. Based on a study of recent years' experience, the factor required to achieve a reasonable equivalent of two years of run-off premium is 26.9% of the reserve for unearned premium, as reflected in the statutory financial statement as of the date the computation is made.

Multiply the unearned premium reserve by the single premium credit factor of 26.9% and subtract the result from the sum of Step 7, 8, and 9 to arrive at the State Regulatory Mortgage Insurer Capital Standard for that particular mortgage guaranty insurance company at the effective date of the calculation.

12. Step 11 – Compute Total Adjusted Capital

Total adjusted capital is the sum of a mortgage guaranty insurance company's surplus as regards policyholders and contingency reserves as determined in accordance with the statutory accounting applicable to the annual financial statements required to be filed in accordance with the laws of the company's state of domicile and such other items as the *Mortgage Guaranty Insurance Standards Manual* may provide.

13. Step 12 – Divide Total Adjusted Capital by the State Regulatory Mortgage Insurer Capital Standard to Determine Applicability of Regulatory Action

Divide Total Adjusted Capital, which is the result of Step 11, by the State Regulatory Mortgage Insurer Capital Standard, which is the result of Step 10, to determine if the company is subject to any regulatory action. Depending on the ratio of Total Adjusted Capital to the State Regulatory Mortgage Insurer Capital Requirement, there are four action levels applicable to mortgage guaranty insurers under the Mortgage Guaranty Insurance Model Act:

- No Action based on Total Adjusted Capital of more than 125% of the NAIC State Regulatory Mortgage Insurer Capital Standard and no indication of material deficiencies in underwriting procedures or in the Mortgage Guaranty Quality Control Program.
- At or below 125% of the NAIC State Regulatory Mortgage Insurer Capital Standard, or if an examination or investigation has indicated material

deficiencies in underwriting procedures or in the Mortgage Guaranty Quality Control Program, Section 7D of the Mortgage Guaranty Insurance Model Act provides that the Domiciliary Commissioner may retain consultants to assist in the assessment of the insurer’s risks, reporting, and remediation plans at the insurer’s expense.

- SRMICS Action Level Event (Total Adjusted Capital of between 51% and 100% of the NAIC State Regulatory Mortgage Insurer Capital Standard) – requires the mortgage guaranty insurer to file a Capital Plan, Domiciliary Commissioner examination or analysis of the insurer, issuance by the Domiciliary Commissioner of a Corrective Order, and allows regulator control of the insurer if this is deemed in the best interests of the policyholders and creditors of the insurer and of the public
- SRMICS Mandatory Control Level Event (Total Adjusted Capital of less than 51% of the NAIC State Regulatory Mortgage Insurer Capital Standard) – requires the mortgage guaranty insurer to cease writing new business and requires the Domiciliary Commissioner to place the insurer under regulatory control. Although the Domiciliary Commissioner may defer seizing regulatory control of the insurer for up to one year after the occurrence of a SRMICS Mandatory Control Level Event, such deferment would, in practice, require the support of substantially all nondomestic states that have enacted the NAIC Mortgage Guaranty Insurance Model Act.

The following chart illustrates the calculation of the State Regulatory Mortgage Insurer Capital Standard at the Book Year and Aggregate Phases:

State Regulatory Mortgage Insurer Capital Standard (SRMICS) (\$ in millions)

Company: Industry Composite

Year End: 2018

| Book Year | (1) Original Risk In Force | (2) Current Risk In Force | (3) Risk Modeled Ultimate Loss | (4) Risk Modeled Future Loss | (5) Adjusted for Seasoning Factor | (6) Company Estimated Reinsurance Ceded | (7) Margin for Expense | (8) Premium Credit | (9) SRMICS |
|-----------|-------------------------------|------------------------------|-----------------------------------|---------------------------------|--------------------------------------|--|---------------------------|-----------------------|---------------|
| 1999 | 33,460 | 61 | 1,206 | 2 | 1 | - | 1 | 1 | 1 |
| 2000 | 25,251 | 76 | 884 | 4 | 3 | - | 1 | 2 | 2 |
| 2001 | 44,552 | 174 | 1,776 | 9 | 6 | - | 2 | 7 | 2 |
| 2002 | 47,839 | 334 | 2,813 | 23 | 19 | - | 3 | 13 | 6 |
| 2003 | 59,053 | 808 | 5,145 | 78 | 54 | - | 8 | 37 | 25 |
| 2004 | 37,992 | 1,221 | 4,737 | 155 | 108 | - | 12 | 57 | 64 |
| 2005 | 37,016 | 2,633 | 6,696 | 480 | 336 | - | 26 | 118 | 245 |
| 2006 | 34,354 | 4,377 | 7,100 | 955 | 668 | - | 44 | 194 | 518 |
| 2007 | 51,319 | 10,091 | 8,867 | 1,852 | 1,296 | - | 101 | 386 | 1,012 |
| 2008 | 29,528 | 5,425 | 2,094 | 530 | 371 | - | 54 | 145 | 281 |
| 2009 | 11,722 | 666 | 191 | 14 | 9 | - | 7 | 26 | 7 |
| 2010 | 10,339 | 738 | 140 | 10 | 7 | - | 7 | 22 | 7 |
| 2011 | 14,147 | 2,131 | 171 | 28 | 21 | - | 21 | 48 | 21 |
| 2012 | 29,740 | 8,552 | 364 | 107 | 85 | - | 86 | 194 | 86 |
| 2013 | 40,722 | 14,169 | 542 | 192 | 163 | - | 142 | 385 | 142 |
| 2014 | 40,206 | 17,838 | 569 | 254 | 229 | - | 178 | 550 | 178 |
| 2015 | 50,957 | 32,371 | 746 | 471 | 471 | - | 324 | 994 | 324 |

| | | | | | | | | | |
|------------------|----------------|----------------|---------------|---------------|--------------|---|--------------|--------------|--------------|
| 2016 | 62,451 | 52,536 | 1,319 | 1,097 | 1,097 | - | 525 | 1,733 | 525 |
| 2017 | 62,615 | 60,166 | 2,208 | 2,130 | 2,130 | - | 602 | 2,157 | 602 |
| 2018 | 68,910 | 68,910 | 2,282 | 2,282 | 2,282 | - | 689 | 2,471 | 689 |
| 20 YR TTL | 792,173 | 283,278 | 49,849 | 10,673 | 9,356 | - | 2,833 | 9,540 | 4,736 |

| | | | | | | | | | |
|---------|-------|-----------|-----------------------------|--|--|--|--|--|--------------|
| Pool | 1,000 | times 10% | (10) | | | | | | 100 |
| Assumed | 1,000 | times 5% | (11) | | | | | | <u>50</u> |
| | | | (12)=20 YR SRMICS+(10)+(11) | | | | | Subtotal SRMICS | 4,886 |
| | | | (13) | | | | | Unearned Premium Reserve | 1,730 |
| | | | (14) | | | | | UPR*0.269=Single Premium Credit | <u>465</u> |
| | | | (15)=(12) – (14) | | | | | Subtotal less Single Premium Credit=Final SRMICS | 4,421 |
| | | | (16) | | | | | Statutory Surplus | 6,593 |
| | | | (17) | | | | | Contingency Reserve | <u>9,749</u> |
| | | | (18)=(16)+(17) | | | | | TOTAL CAPITAL | 16,342 |

(10) and (11) are illustrative only and were not drawn from industry aggregate information

E. Loan Level Capital Standards

Overall mortgage guaranty insurance company Loan Level Capital Model requirements are set forth in Section 7C of the Mortgage Guaranty Insurance Model Act. The following Loan Level system related considerations constitute additional supporting requirements mandated under the Mortgage Guaranty Insurance Model Act.

1. Overall Methodology

Mortgage guaranty insurance Loan Level Capital Model calculations shall be in accordance with the following data file inputs and outputs.

a. Loan Level MI Data Inputs

The loan level capital model dataset shall contain a certificate ID for the given yearly snapshot along with loan performance status, appended loan level static data fields as of loan origination and appended historical macroeconomic data.

Data file information shall be maintained in a standardized fashion, including standardized variable names and formats to facilitate capital modeling across all mortgage guaranty insurance group companies, as described under the following Loan Level Statistical Model Inputs.

Loan-Level Statistical Model Inputs

| Input Type | Input | Description |
|----------------|------------------------|---|
| Macro-economic | Home price index (HPI) | Scenario of path of home prices over the projection horizon, with the severity level calibrated relative to long-run trend in HPI |

| | | |
|----------------|--------------------------------|---|
| Macro-economic | Unemployment rate | Fixed target level of unemployment, with a minimum absolute increase from the unemployment rate as of a given snapshot date |
| Macro-economic | US Treasury Interest rates | Projection of 3 month, 1 year, 2 year, 3 year, 5 year, and 10 year interest rate scenarios, with years 1-7 of the projection reflecting a downturn environment and years 8-10 reflecting recovery |
| Loan-level | Original FICO | Minimum of FICO scores among co-borrowers at origination; lender provided |
| Loan-level | Original DTI - front end ratio | PITI-to-income ratio in decimal (if available) |
| Loan-level | Original DTI - back end ratio | Obligation-to-income ratio in decimal (obligation inclusive of payments beyond loan insured) |
| Loan-level | First time buyer | Flag to identify if (primary) borrower is a first-time buyer |
| Loan-level | Self-employment | Flag to identify if borrower is a self-employed |
| Loan-level | Company ID | Identifier of the source of the MI loan |
| Loan-level | Loan origination date | Origination date of the underlying mortgage being insured |
| Loan-level | Original UPB | Original mortgage amount (\$) |
| Loan-level | Original LTV | Original LTV ratio in decimal |
| Loan-level | State | Property state |
| Loan-level | Property zip code | 5-digit zip code of the property |
| Loan-level | Loan payment term | Loan term (in months), defined as period at end of which, if the loan is not paid, it becomes due and payable (will differ from amortization for balloons) |
| Loan-level | Amortization term | Amortization period of the underlying mortgage (in months); defined as term over which, if the loan were fixed rate fixed payment it would be paid off |

| | | |
|------------|---|---|
| Loan-level | Loan purpose | Purpose of the mortgage loan (e.g., purchase vs refinance) |
| Loan-level | Number of borrowers | Number of borrowers |
| Loan-level | Mortgage instrument type | Type of interest rate / payment for the underlying mortgage. For hybrid loan products, the time a change in rate/payment takes effect will be captured in fields "Months until first rate change" and "Months until first payment change" |
| Loan-level | Negative Amortization | Potential: will not occur under all interest rate scenarios Scheduled: will occur under any and all interest rate scenarios |
| Loan-level | Interest only flag | Indicator for interest-only feature of the mortgage |
| Loan-level | Balloon flag | Indicator for a balloon mortgage |
| Loan-level | Mortgage rate | Contractual interest rate of the mortgage in decimal |
| Loan-level | Doc type | Documentation type; for modified loans, original documentation status should be used rather than doc type after modification |
| Loan-level | Property use | Purpose of the property [* if available] |
| Loan-level | Property type | Type of the property [* if available] |
| Loan-level | Mortgage rate index | Interest rate index used to determine contractual rate for ARM |
| Loan-level | Months until first rate change (at origination) | Time till first rate change (in months). This field applies to ARM products. In addition, this field will indicate when a change in rate takes effect for hybrid loans |
| Loan-level | Frequency of rate change following first reset | Frequency at which rate is updated (in months) following the first reset |

| | | |
|------------|--------------------------------|--|
| Loan-level | Contract rate increase caps | The maximum increase in rate allowed from one adjustment period to the next (in bps) |
| Loan-level | Cumulative rate increase caps | Maximum rate increase allowed over initial rate (in bps) |
| Loan-level | Contract rate decrease floor | Periodic rate decrease limit (in bps) |
| Loan-level | Cumulative rate decrease floor | Cumulative rate decrease limit (in bps) |
| Loan-level | ARM lookback period | Lookback period to identify index rate for rate reset (rounded to months) |
| Loan-level | Investor type | Type of investor (e.g., GSE vs. private label); flag as GSE if the loan is "ever" GSE |
| Loan-level | Lender | Type of lender (initial insured) |
| Loan-level | Third party origination | Third party originator (broker or correspondent), if applicable |
| Loan-level | Current UPB | Current outstanding unpaid principal balance of mortgage (\$); negative numbers should be rounded up to zero; UPB may be estimated if information was not provided to the MI |
| Loan-level | Current contractual rate | Current contractual rate in decimal |
| Loan-level | Bankruptcy flag | Bankruptcy of (primary) borrower |
| Loan-level | Policy coverage | MI policy coverage in decimal (prior to any reinsurance) |
| Loan-level | Policy effective date | Start date of the MI policy (usually the same as origination date of the mortgage insurance except for pools/bulks) |
| Loan-level | Certificate ID number | Insurance certificate ID number (unique by carrier) |
| Loan-level | Reinsurance | Reinsurance indicator (external reinsurance only) |

| | | |
|------------|----------------------------|--|
| Loan-level | Reinsurance pool number | Internal pool indicator used to map loan to a reinsurance pool (external reinsurance only) |
| Loan-level | Bulk flag | Flag to capture whether loan came from a bulk deal |
| Loan-level | Pool flag | Flag to capture whether loan came from a pool deal |
| Loan-level | Pool identifier | Pool deal ID |
| Loan-level | Borrower paid/lender paid | Flag to identify party who paid for the mortgage insurance; investor paid should be counted as lender paid |
| Loan-level | Refundability | Refundability of MI premium |
| Loan-level | Premium type | Premium payment plan / frequency |
| Loan-level | MI Premium rate | Premium rate of the MI policy (in bps, expressed as an annual rate) |
| Loan-level | Plan/Renewal Type | Signifying amortizing versus constant renewal, also governing the step down |
| Loan-level | Upfront premium | Upfront rate for split premium (in bps) |
| Loan-level | Ceded premium | Premium ceded due to reinsurance in decimal |
| Loan-level | Modification | This field identifies presence and type of modification |
| Loan-level | Foreclosure flag | This field identifies presence and status of foreclosure |
| Loan-level | Due For Date | Due date of 1st unpaid installment to be used to deduce delinquency status; for rescinded/denied loans, the last known status should be captured |
| Loan-level | Payments past due | Amount of payments past due (\$) |
| Loan-level | Simple Status | Identifies current status of loan |
| Loan-level | Cancellation / termination | This field identifies whether the mortgage has been prepaid in full or if MI has been terminated due to other reasons |

| | | |
|------------|-----------------------|--|
| Loan-level | Claim status | This fields captures the current status of MI claims |
| Loan-level | Audited claim amount | Total audited MI claim amount submitted (\$) (outstanding UPB + accrued interests under contractual rate + allowable costs (e.g., legal / maintenance fees) but excluding penalty charges) |
| Loan-level | Initial date of claim | The date at which the MI claim was first filed |
| Loan-level | Settlement option | Flag to determine whether MI determined to take over the title of the property vs. paying MI coverage |
| Loan-level | Final payment | Final payment after curtailments and adjustments and recoveries on REO if full claim is paid and possession is taken |
| Loan-level | Rescissions flag | This field identifies presence and timing of rescission |

b. Loan Level MI Data Outputs

Loan Level capital model output shall be aggregated by probability of default segment, delinquency status, vintage, bulk loans, pool loans and post default loans for each projection year.

The model output shall include a table designed to be placed into an excel worksheet that aggregates the information by projection year and additional bucketing options.

The model output shall include the information described under the following Loan Level Statistical Model Outputs.

Loan Level Statistical Model Outputs

| Output | Description |
|-----------------------|--|
| In force dollars | The remaining dollars in force for each projection year |
| Risk in force dollars | The remaining risk in force dollars for each projection year |
| Default dollars | The number of default dollars for each projection year |
| Prepayment dollars | The number of prepayment dollars for each projection year |
| Premium dollars | The number of premium dollars for each projection year |

| | |
|-----------------------------------|---|
| Refund dollars | The number of refund dollars for each projection year; this only applies to single premium loans |
| HPA cancellation dollars | The number of cancellation dollars based on HPA cancellation regulations for each projection year |
| Claim dollars | The number of claim dollars for each projection year |
| Cure dollars | The number of cure dollars for each projection year |
| Post default cancel dollars | The number of post default cancel dollars for each projection year |
| Gross loss dollars | The number of loss dollars before structures for each projection year |
| Net loss dollars | The number of loss dollars post structures for each projection year |
| Expense dollars | The number of expense dollars for each projection year Expenses are a portion of expected loss dollars |
| Other expense dollars | The number of other expense dollars for each projection year; other expenses are a portion of expected premium dollars |
| Loan level capped premium dollars | The number of premium dollars if loan level capital is floored at 0 |

2. Probability of Default Projection

Capital model estimation of the probability of default utilizes a different logistic regression equation for each of the age and performance segments, including:

- Unseasoned < 12 months
- Performing > 12 months
- Blemished > 12 months
- Delinquent > 12 months

The forecast of the conditional annual default rate shall be based on the following Generalized PD Model Equation.

Generalized PD Model Equation

$$\ln\left(\frac{PD(t)}{1 - PD(t)}\right) = \alpha + \sum \beta_i X_i(0) + \sum \rho_i X_i(t) + \sum \gamma_j Z_j(t)$$

Where:

t: Projection year, based on calendar date

- $PD(t)$:** Probability of defaulting in year t , conditional upon having survived to the end of year $t-1$
- α :** Intercept
- $\sum \beta_i X_i(0)$:** Impact of loan-level origination characteristics
- $\sum \rho_i X_i(t)$:** Impact of dynamic loan-level characteristics as of the projection period (e.g. loan age, current LTV)
- $\sum \gamma_j Z_j(t)$:** Impact of macroeconomic factors as of projection period t

3. Probability of Prepayment Projection

Capital model estimation of the probability of prepayment utilizes a different logistic regression equation for each of the instrument type and lifecycle segments, including:

- Fixed rate mortgage
- Hybrid mortgage within initial fixed phase of lifecycle
- Floating hybrid mortgage within the floating phase of lifecycle or ARM

The prepayment model forecast shall be based on the following Generalized Prepayment Model Equation.

Generalized Prepayment Model Equation

$$\ln\left(\frac{\text{ProbPrepayment}(t)}{1 - \text{ProbPrepayment}(t)}\right) = \alpha + \sum \beta_i X_i(0) + \sum \rho_i X_i(t) + \sum \gamma_j Z_j(t)$$

Where:

- t :** Projection year, based on calendar date
- $\text{Prob_Prepayment}(t)$:** Probability of prepaying in year t , conditional upon having survived to the end of year $t-1$
- α :** Intercept
- $\sum \beta_i X_i(0)$:** Impact of loan-level origination characteristics
- $\sum \rho_i X_i(t)$:** Impact of dynamic loan-level characteristics as of the projection period (e.g. refinance incentive, current LTV)
- $\sum \gamma_j Z_j(t)$:** Impact of macroeconomic factors as of projection period t

4. Loss Given Default Projection

The claim amount required to pay, in the event that a defaulted loan results in a claim, is a function of the outstanding loan balance, capitalized interest and costs, recoveries on foreclosed collateral and MI loan coverage level in place.

The final loss amount is a function of a loan's LTV at the time of default, since the property value at the time of default drives recovery amounts subtracted from the borrower's outstanding obligation.

Losses for coverages under 40%, which represent the majority of MI loan coverage levels, shall be estimated based on a fixed multiplier of expected risk in force at the time of default.

The projected loss for coverage levels between 40% and 100%, which generally represent immaterial coverage levels except for single pool coverage contracts, shall be estimated as a function of borrower obligation at default and expected recoveries given loan to value at the time of default, based on the following LGD Expression for 100% Coverage Loans.

LGD Expression for 100% Coverage Loans

$$\left(\left(UPB_{Default} \times (1 + MortgageRate) - (HomeValue_{Default} \times (1 - (Haircut + Costs))) \right) \right) \div UPB_{Default}; \text{ floor at 30\%}$$

5. Premium Income Projection

Constant and amortizing renewal premium projections shall be based on the following premium rate and original or current UPB equations:

Constant Renewal Premium Projection Logic

$$Premium = \frac{premium\ rate}{10000} * original\ UPB * Average\ probability\ survival$$

Amortizing renewal premium projection logic

$$Premium = \frac{premium\ rate}{10000} * current\ UPB * Average\ probability\ survival$$

6. Investment Income Projection

Invested asset balances and returns shall be projected based on the assumption that the portfolio mix represents a relatively constant share of overall investment balances.

Unaffiliated investments only shall be included in future income calculations.

Investment income projections for applicable investment classes shall be based on the following calculations:

Asset Balance Calculation

$$Asset\ Balance_t(YearEnd) = Asset\ Balance_{t-1}(YearEnd) + Premiums_t - Losses_t - Expenses_t + InvestmentIncome_t$$

Long-term Bond Income Calculation

$$Income_t = Average(Bond\ Balance_{t-1}, Bond\ Balance_t) * Yield_t$$

Long-term Bond Balance Calculation

$$Bond\ Balance_t = Asset\ Balance_t * \left(\frac{Bond\ Balance_{t-1}}{Asset\ Balance_{t-1}} \right)$$

Long-term Bond Yield Calculation

$$Yield_t = Yield_{t-1} * \{1 - [1/(2 * m)]\} + [1/(2 * m)] * (r + s)$$

Short-term Income Calculation

$$Income_t = Average(ShortTerm\ Balance_{t-1}, ShortTerm\ Balance_t) * Yield_t$$

Short-term Yield Calculation

$$Yield_t = 3 - month\ treasury\ rate_t$$

Equity Income Calculation

$$Income_t = Average(EquityBalance_{t-1}, EquityBalance_t) * Yield_t$$

Equity Yield Calculation

$$Yield_t = Average\ yield\ on\ equities, 2004 - 2013; excluding\ outlier\ years$$

Other Invested Assets Income Calculation

$$Income_t = Average(OtherAssetsBalance_{t-1}, OtherAssetsBalance_t) * Yield_t$$

Other Invested Assets Yield Calculation

$$Yield_t = Average\ yield\ on\ equities, 2004 - 2013; excluding\ outlier\ years$$

7. Expense Projection

a. *Loss Adjusting Expense*

Loss adjusting expense shall be projected based on the following loss incurred and historical average industry LAE ratio calculation:

$$LAE_t = Average(Loss_{t-1}, Loss_t) * Historical Industry LAE ratio$$

$$Historical Industry LAE ratio = \frac{\sum_{2003}^{2012} Average(Loss_{t-1}, Loss_t) * LAE_t}{\sum_{2003}^{2012} Average(Loss_{t-1}, Loss_t)}$$

The ratio of LAE to two year losses calibrated based on industry experience, which is used to project LAE in the model, is 3.8%.

b. *Other Expense*

Expenses other than LAE shall be projected as a constant function of projected premiums for the MI loan book of business. The capital model projects non-loss expenses as a percentage equal to the insurer's previous two years' average non-loss expense ratio to net premiums earned, given that expense levels tend to differ both by insurer and over time.