Mortgage Insurance Loss Reserving 101

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Consulting Actuary

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Σ The
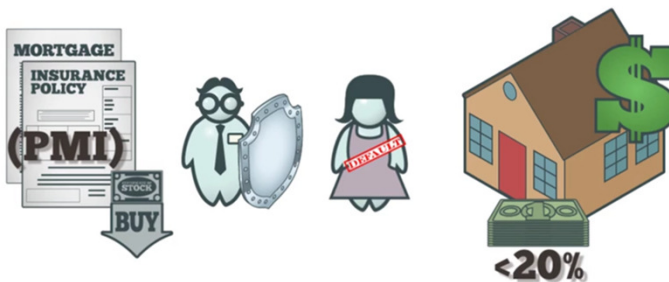Actuarial
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Overview

- What is Mortgage Insurance (MI)?
- MI Loss Reserving

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What Is Mortgage Insurance?

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What is Mortgage Insurance?

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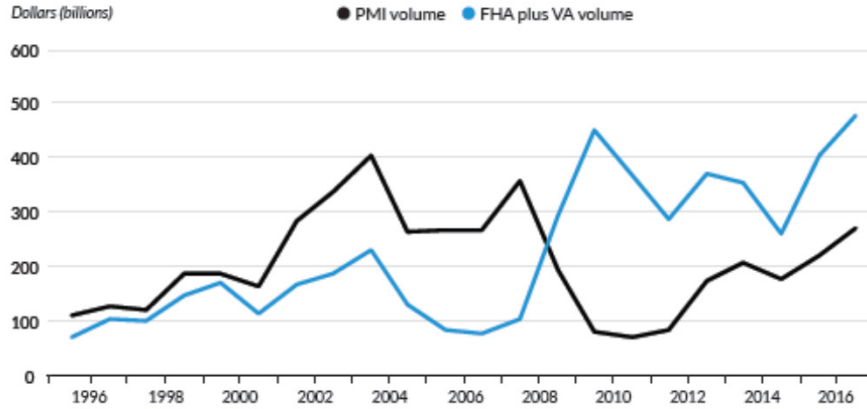
Source: www.usmi.org

What is Mortgage Insurance? (cont.)

▸ **Government v Private**

Annual Mortgage Insurance Volume: PMI versus FHA/VA

Dollars (billions) ● PMI volume ● FHA plus VA volume
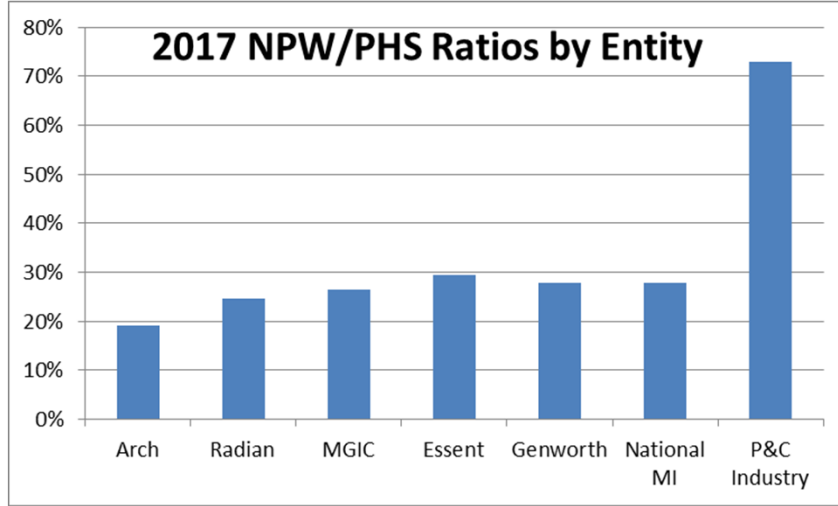

Source: Urban Institute

What is Mortgage Insurance? (cont.)

2017 PMI Market Share
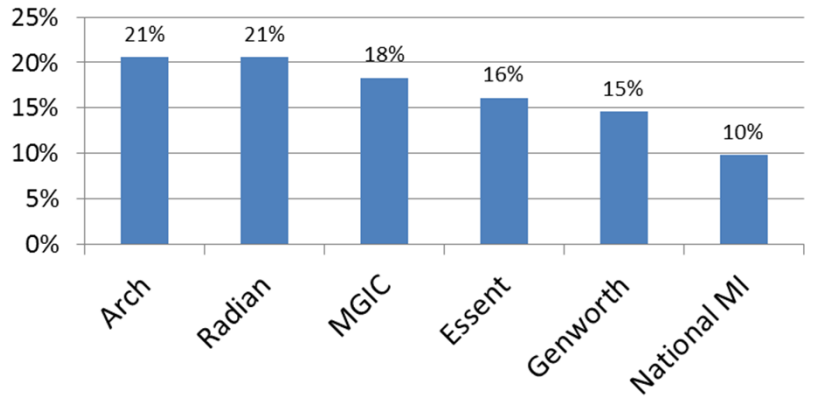
Source: National Mortgage News

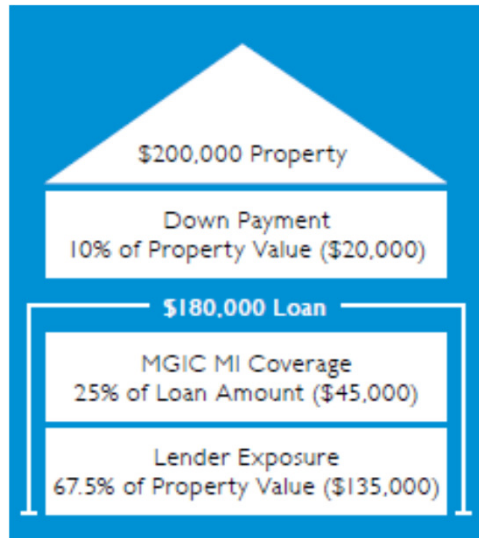## What is Mortgage Insurance? (cont.)

2017 NPW/PHS Ratios by Entity

Entity	Ratio
Arch	~19%
Radian	~25%
MGIC	~26%
Essent	~29%
Genworth	~28%
National MI	~28%
P&C Industry	~73%

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What is Mortgage Insurance? (cont.)

▸ Coverage

$200,000 Property

Down Payment
10% of Property Value ($20,000)

$180,000 Loan

MGIC MI Coverage
25% of Loan Amount ($45,000)

Lender Exposure
67.5% of Property Value ($135,000)

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Source: MGIC

What is Mortgage Insurance? (cont.)

▸ Premium
  ▸ Premium plan, mortgage program, loan term, loan to value, coverage, loan amount, borrower credit score, risk adjustments
  ▸ BPMI Premium = Rate /12 * Original Loan Amount

Amortization term > 20 years | Non-refundable

Fixed (FIXED PAYMENTS FOR ≥ 5 YEARS)*										
LTV	Coverage	760+	740-759	720-739	700-719	680-699	660-679	640-659	620-639
97% -95.01%	35%	.58%	.70%	.87%	.99%	1.21%	1.54%	1.65%	1.86%
	25	.46	.58	.70	.79	.98	1.23	1.31	1.50
	18	.39	.51	.61	.68	.85	1.05	1.17	1.27
95% -90.01%	30	.38	.53	.66	.78	.96	1.28	1.33	1.42
	25	.34	.48	.59	.68	.87	1.11	1.19	1.25
	16	.30	.40	.48	.58	.72	.95	1.04	1.13
90% -85.01%	25	.28	.38	.46	.55	.65	.90	.91	.94
	12	.22	.27	.32	.39	.46	.62	.65	.73
85% & Below	12	.19	.20	.23	.25	.28	.38	.40	.44
	6	.17	.19	.22	.24	.27	.37	.39	.42

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What is Mortgage Insurance? (cont.)

▸ Claim Settlement
  ▸ Two basic options
    ▸ Payment=Calculated Loss * Coverage, or
    ▸ Payment=Calculated Loss – Net Proceeds
  ▸ Calculated Loss=unpaid balance + unpaid interest + expenses
▸ Cancellation

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MI Loss Reserving

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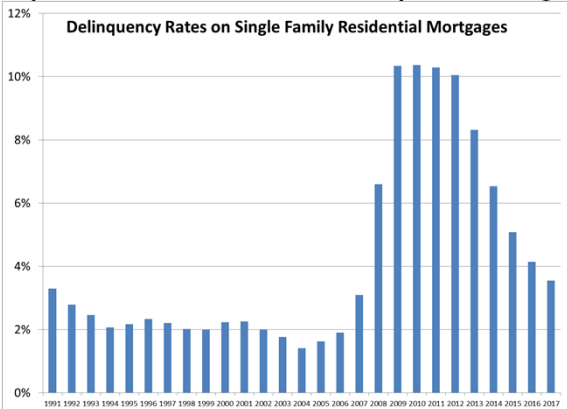## MI Loss Reserving

▸ Loss reserve – expected loss for only **delinquent** loans

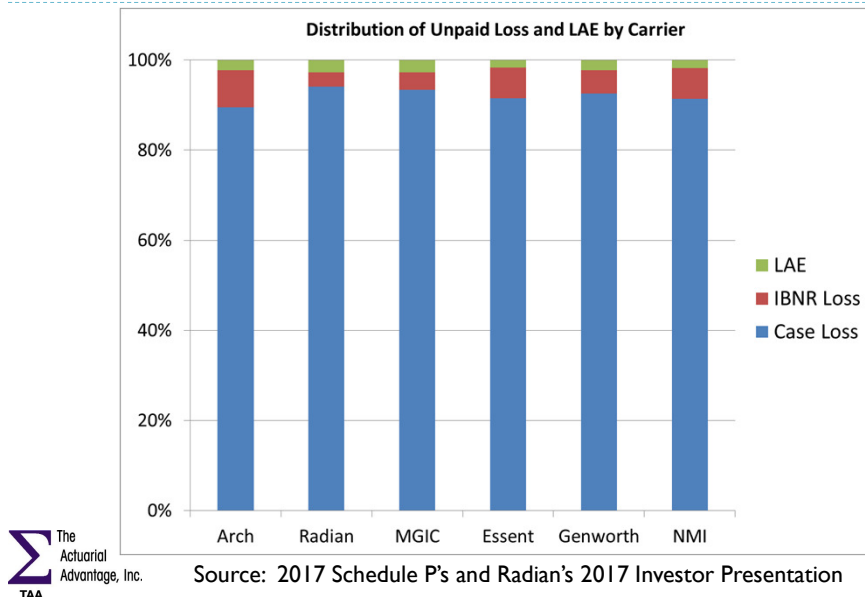▸ MI loss reserves do not reflect expected losses on currently insured loans which are performing

Delinquency Rates on Single Family Residential Mortgages

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Source: Fed Reserve Bank of St Louis

MI Loss Reserving (cont.)

Distribution of Unpaid Loss and LAE by Carrier

Legend:
- LAE
- IBNR Loss
- Case Loss

Categories: Arch, Radian, MGIC, Essent, Genworth, NMI

Y-axis: 0%, 20%, 40%, 60%, 80%, 100%

Source: 2017 Schedule P's and Radian's 2017 Investor Presentation

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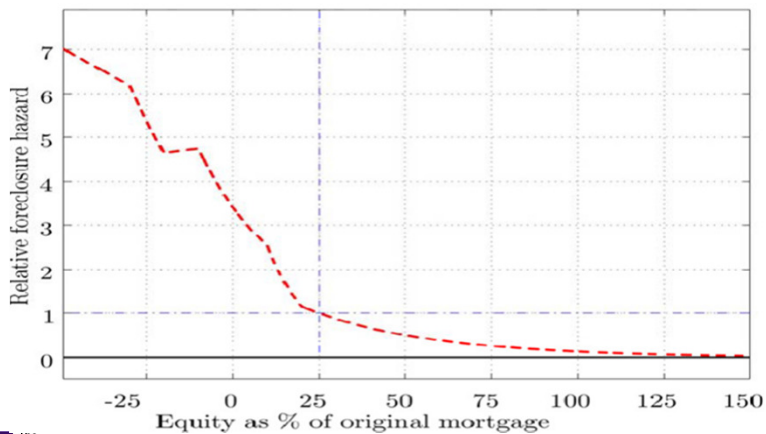## MI Loss Reserving (cont.)

▸ Not ideally suited to traditional reserving methods

Estimated Effect of Equity on Default

Y-axis: Relative foreclosure hazard (0 to 7)
X-axis: Equity as % of original mortgage (-25, 0, 25, 50, 75, 100, 125, 150)

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MI Loss Reserving (cont.)

- ▸ Case Loss Reserve Approach
  - ▸ Freq/Sev E(L)=Pr(Claim|Delinquent)*E(Loss|Claim)
  - ▸ Aggregate development methods(?)
- ▸ IBNR Loss Reserve Approach
  - ▸ Freq/Sev
  - ▸ IBNR/Case
- ▸ LAE Reserve Approach
  - ▸ Similar to case loss
  - ▸ LAE/Loss

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MI Loss Reserving (cont.)

- ▸ Reserving Risk Factors
  - ▸ Number of missed payments (Delinquency Status)
  - ▸ Current Loan to Value (CLTV)
  - ▸ Economic conditions (HPA, unemp., int. rates, natural disasters)
  - ▸ Borrower ability to pay
  - ▸ State laws

Judicial & Non-Judicial States

Source: MBA

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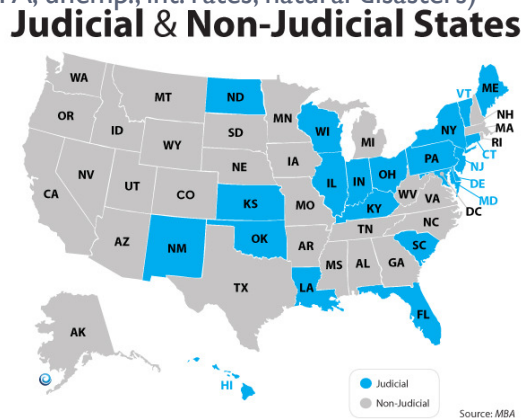
MI Loss Reserving (cont.)

- ▶ Model parameterization
  - ▶ Frequency
    - ▶ Incremental roll rate
    - ▶ Ultimate claim resolution
  - ▶ Severity
- ▶ Data
  - ▶ PMI
  - ▶ External data
    - ▶ Underwriting data
    - ▶ Economic data
- ▶ Don't forget PDR

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