MGIC Perspectives on CECL

Presented by MGIC in partnership with Wilary Winn

Innovative solutions from MGIC

Benefits of Mortgage Insurance

- Selling loans to the GSEs
- Protects against losses on loans held in portfolio
- Cuts the amount of required capital in half for 90% LTV+ mortgages

…and that's just the beginning

CECL is Coming

- You will have to reserve for lifetime expected losses for loans held for investment.
- It's not just a go-forward issue, it impacts the portfolio you hold <u>today</u>
- Immediate impact to:
  - Pricing
  - Income
  - Balance Sheet

…thankfully, there is a solution!

MI Reduces CECL Loss Reserves

- Primary mortgage insurance, structurally attached to the loan, will reduce your expected credit losses under CECL.
  - Translation: the same Borrower- or Lender-Paid MI that you routinely purchased can help ease the headaches associated with CECL

- Freestanding contracts won't receive the benefit, e.g.
  - Pool Policies
  - A guarantee that is separate from the asset
  - Anything legally detachable and separately exercisable

- Consult the FASB ASU 2016-13 for more details, paying particular attention to:
  - The definition of "Freestanding Contract"
  - Sections
    - 326-20-30-12
    - 326-30-35-5
    - 326-30-55-4

Impact of MI

- Smaller loss reserves
- Less volatility of reserves, which means less income volatility
- The CECL benefit can help offset the cost of MI

Example

Modeled Loan – Loss Given Default	
Original Value	$200,000
Original LTV	95%
Original UPB	$190,000
UPB at Default	$186,654
Claimable Expenses	$27,998
Total Claimable Amount	$214,652
REO Expense	$20,532
Sale Proceeds	($160,000)
Lender Loss Given Default	$75,184

Modeled Loan – CECL Reserve	
Probability of Default	2.00%
Loss Severity (% of Orig UPB)	39.6%
CECL Reserve – No MI	$1504
MI Proceeds 25% Coverage	$53,663
CECL Reserve – 25% MI	$430
MI Proceeds 30% Coverage	$64,396
CECL Reserve – 30% MI	$216

Plan of Action

- Insure new production going forward

- Secure MI on your existing portfolio

- MGIC has solutions
  - Our standard guidelines, as well as our Portfolio Playbook offerings
  - Seasoned loans
    - Flow channel for small volumes
    - Bulk channel for larger volumes

You can contact your MGIC Account Manager, or reach out to me directly:

Garrett Hartzog: garrett_hartzog@mgic.com or (414) 347-2749

MGIC wants to help our customers make the right choice

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- In order to figure out your MI strategy for CECL, you need to be able to determine your CECL exposure
- Understanding your CECL exposure will inform the coverage level that you will purchase
- You may need to enlist the services of a third-party to help you implement CECL, such as Wilary Winn

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ADVICE TO STRENGTHEN FINANCIAL INSTITUTIONS

CECL and Capital at Risk

MGIC Training Series

Douglas Winn, President
Matt Erickson, Director
Wilary Winn LLC

May 8, 2019

WILARY WINN LLC

BACKGROUND

Founded in 2003, Wilary Winn provides independent objective, fee-based, financial advice to banks and credit unions nationwide. We currently have more than 500 clients including 67 publicly traded banks and 30 of the top 100 credit unions.

We believe that interest rate, liquidity, and credit risk should be managed on an integrated basis. We believe that a robust implementation of CECL can lead to more informed management decisions and more efficient allocations of capital.

We have performed fully compliant CECL engagements for more than 50 clients thus far.

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TODAY'S PRESENTERS

DOUGLAS WINN

President

Mr. Winn co-founded Wilary Winn in the summer of 2003 and his primary responsibility is to set the firm's strategic direction.

Mr. Winn is a nationally recognized expert in financial institution accounting and regulatory reporting and has led seminars on the subject for many of the country's largest public accounting firms, the AICPA, the FDIC, the FFIEC, and the NCUA. Mr. Winn began his career as a practicing CPA for Arthur Young & Company – now Ernst & Young.

TODAY'S PRESENTERS

MATT ERICKSON

Director

Mr. Erickson leads Wilary Winn's Asset Liability Management (ALM), CECL, and Concentration Risk business lines. He consults with clients on interest rate, credit, concentration, and liquidity risks as well as capital stress testing, risk-based pricing, and real return optimization.

Matt uses his knowledge of credit risk analytics and quantitative analysis skills to strengthen the firm's proprietary valuation models, develop assumption input databases, and track industry-wide performance trends on loans and deposits.

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MEASURING CREDIT LOSSES

- Net carrying amount should be based on the cash flows an entity expects to collect

- Contractual cash flows are adjusted for expected prepayments and defaults
    - Cash flows should not be adjusted for extensions, renewals, or modifications unless a TDR is reasonably expected

- Cash flows expected to be collected are discounted at the effective interest rate when using a discounted cash flow method
    - Credit loss is a carrying amount less present value of expected cash flows

- Measure expected losses on a pool basis whenever similar risk characteristics exist

ESTIMATING CREDIT LOSSES

- Consider relevant information – internal and external
- Do not rely solely on past events – adjust historical loss information for:
    - Current asset specific risk characteristics
    - Current conditions
    - Reasonable and supportable forecasts
- Life of loan estimate – to estimate losses after reasonable forecast time period revert to historical loss rates

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REGULATORY PERSPECTIVE

- Standard does not specify a single method for measuring expected credit losses
- Smaller and less complex institutions do not have to use costly and complex models
- Institutions may apply different modeling methods to different groups of financial assets

CREDIT LOSS MODELS

- Weighted average remaining maturity method (WARM)
  - Historical average loss rates for similar assets, e.g. HELOCs
- Static Pool
  - Historical loss rates on pools with similar attributes, e.g. Prime 30 year fixed
- Vintage analysis
  - Historical loss rates based on origination year generally including annual loss curves
- Migration or roll-rate
  - Likelihood of loan migrating to default
- Discounted cash flow

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CREDIT LOSS MODELS

- Modeling should be based on type of loan
- For example, MBLs that are CRE – re-underwrite higher risk loans and use migration analysis for lower risk loans
- Residential real estate and consumer loans are best modeled statistically:
    - Probability of default analyses – probability of default and loss given default
    - Static pool
    - Vintage analyses
    - Discounted cash flow analyses

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PREDICTIVE CREDIT INDICATORS

- Research conducted by others
  - Ratings agencies – approach by type of securitization
  - Credit reporting bureaus
  - Mortgage insurers

- Appropriate level to model – loan or cohort

- Need to have cohorts that perform similarly
  - FICO Distribution

- Correlation is not causation

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PREDICTIVE INPUTS

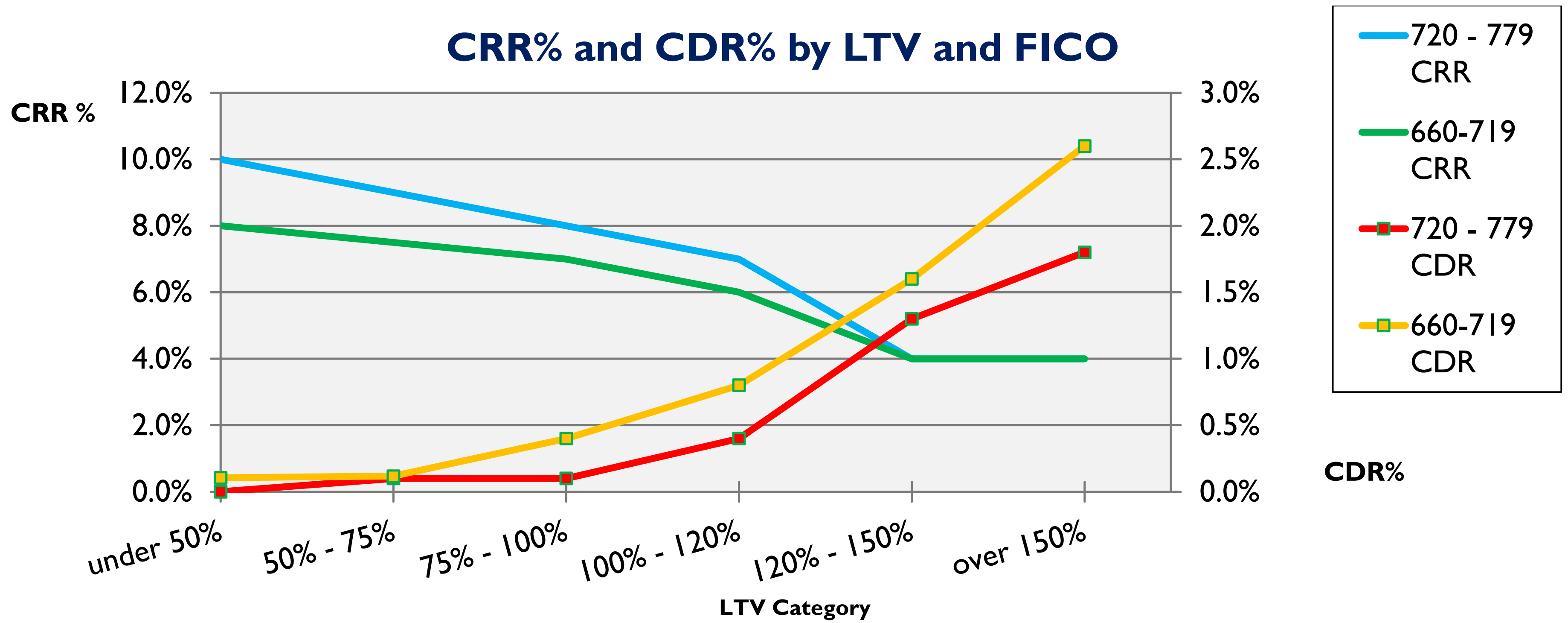
EXAMPLES:

- Performance of auto loans is highly correlated to new vs. used, direct vs. indirect, loan term, FICO score, and the unemployment rate

- Performance of residential real estate loans is highly correlated to FICO **and** CLTV, the unemployment rate and changes in housing prices

- Performance of C & I loans is correlated to industry and local business conditions

LOAN STRATIFICATION - COHORT



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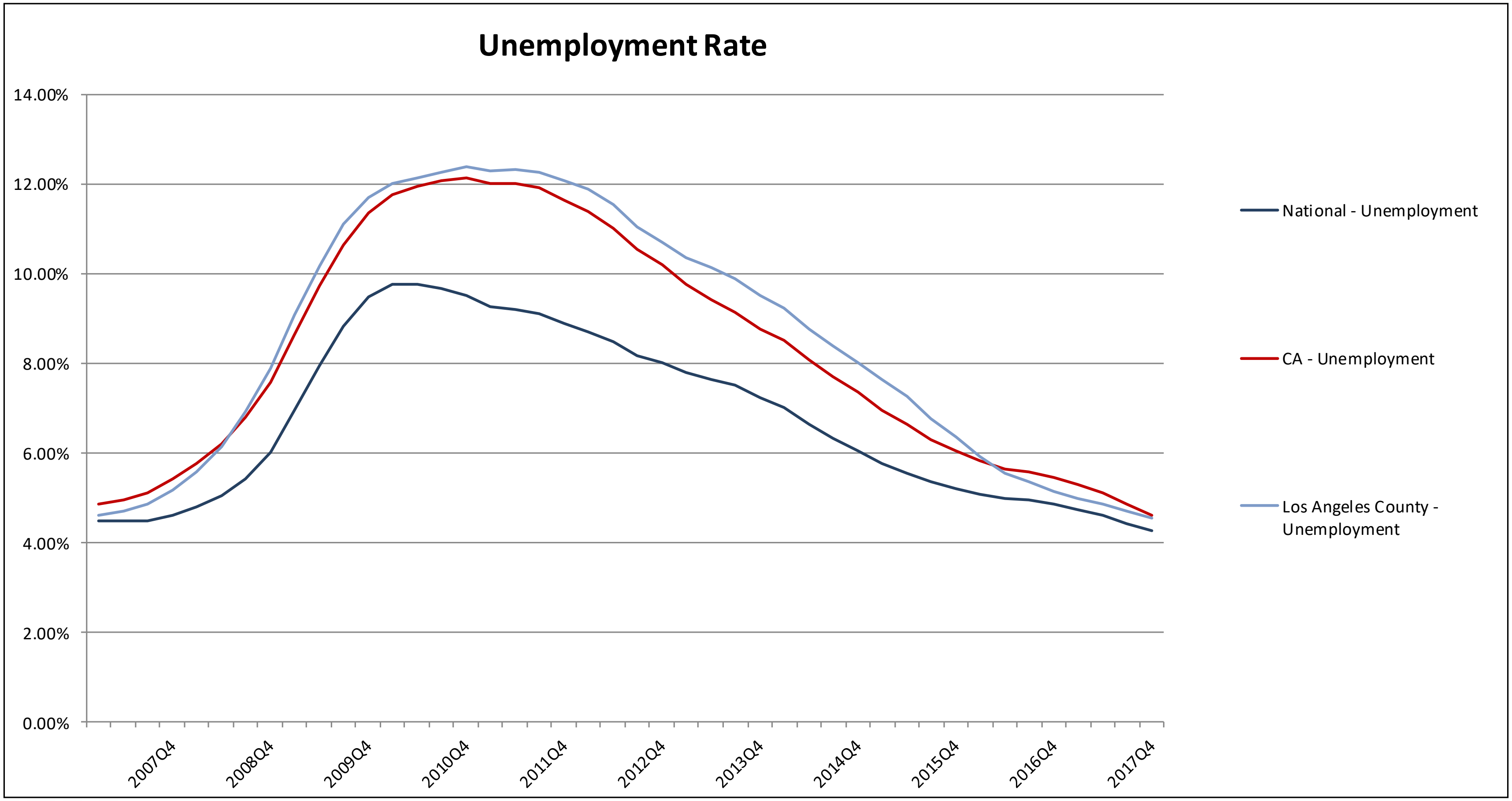
PREDICTIVE INPUTS



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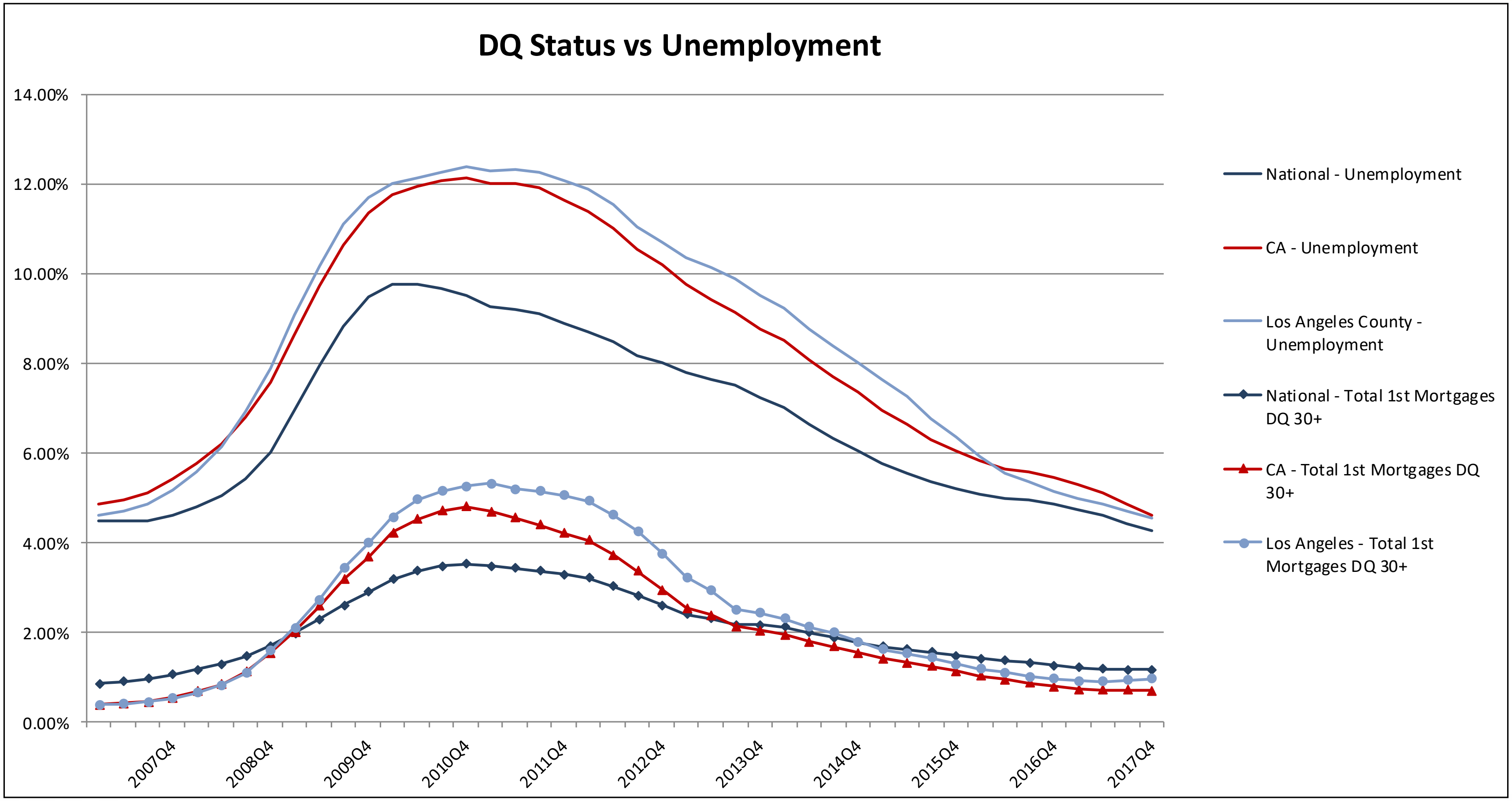
PREDICTIVE INPUTS



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PREDICTIVE INPUTS

QUANTIFYING THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND DEFAULTS:

- Perform regression analysis to determine best fit trend line including beta and R-squared
- Perform roll rate analysis to determine estimated default rates for any given unemployment rate
- Utilize changes between scenarios to determine default factors

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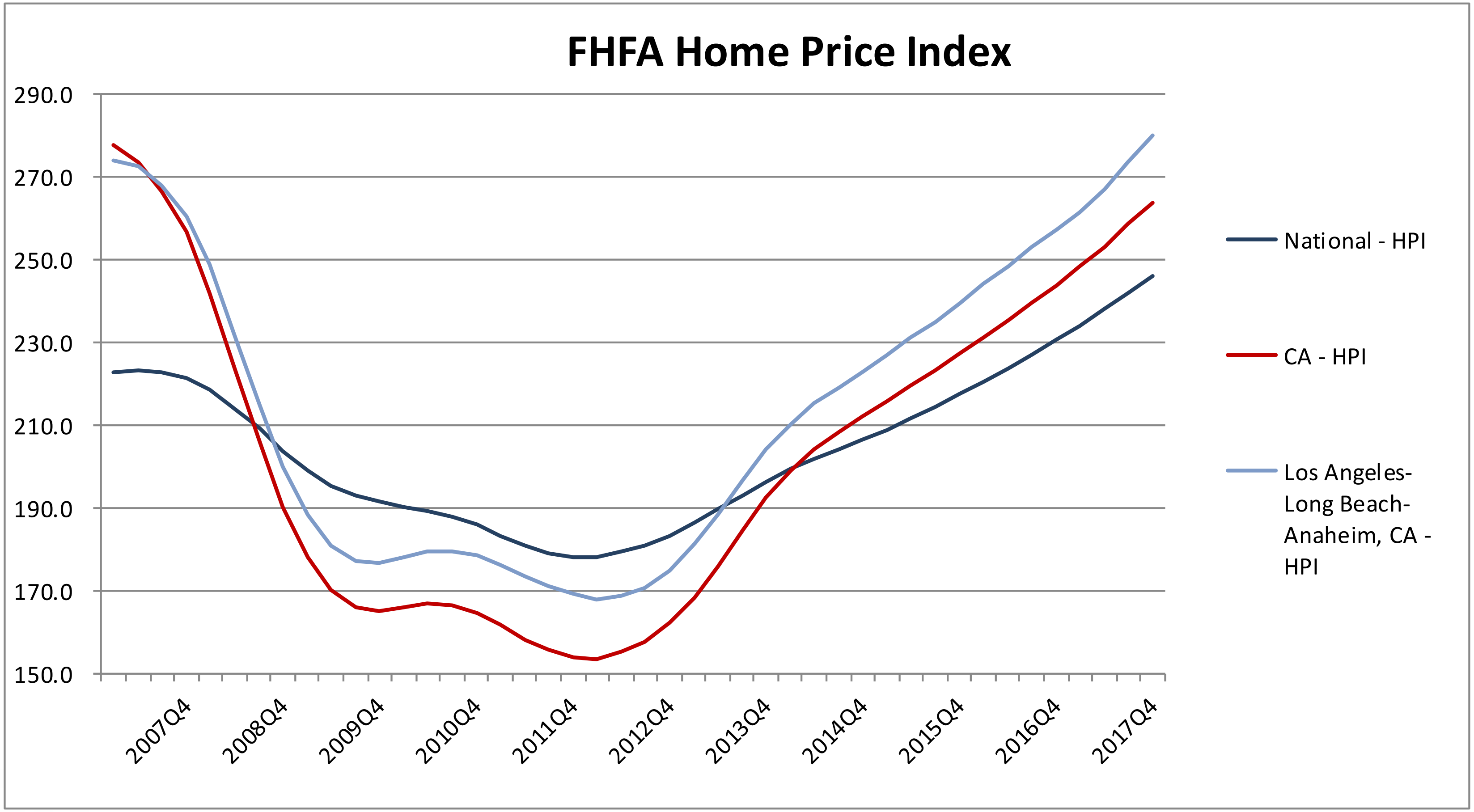
PREDICTIVE INPUTS

Unemployment and Default Factors by Year - Cyclical Assumptions											
Market	**Loan Category**	**Yr 1 2019**	**Yr 2 2020**	**Yr 3 2021**	**Yr 4 2022**	**Yr 5 2023**	**Yr 6 2024**	**Yr 7 2025**	**Yr 8 2026**	**Yr 9 2027**	**Yr 10 2028**
Unemployment											
National		4.80%	7.10%	9.70%	9.10%	8.30%	7.60%	6.50%	5.40%	4.80%	4.50%
Los Angeles MSA		5.70%	9.50%	11.90%	11.60%	10.80%	9.40%	7.90%	6.80%	5.10%	5.10%
Estimated Default Factors											
Los Angeles MSA	1st Mortgage - Fixed	146%	397%	555%	535%	483%	390%	291%	219%	107%	107%
Los Angeles MSA	1st Mortgage - Adjust.	175%	580%	836%	804%	719%	570%	410%	292%	111%	111%
Los Angeles MSA	Other RE - Fixed	146%	393%	549%	530%	478%	386%	289%	217%	107%	107%
Los Angeles MSA	Other RE - Adjust.	113%	187%	233%	227%	212%	185%	156%	135%	102%	102%
Los Angeles MSA	Credit Card	112%	178%	219%	214%	200%	176%	150%	131%	102%	102%
Los Angeles MSA	Other Consumer	124%	256%	339%	329%	301%	253%	201%	162%	103%	103%
Estimated Default Rates											
Los Angeles MSA	1st Mortgage - Fixed	0.38%	1.04%	1.45%	1.40%	1.26%	1.02%	0.76%	0.57%	0.28%	0.28%
Los Angeles MSA	1st Mortgage - Adjust.	0.29%	0.97%	1.40%	1.35%	1.21%	0.96%	0.69%	0.49%	0.19%	0.19%
Los Angeles MSA	Other RE - Fixed	0.20%	0.53%	0.74%	0.72%	0.65%	0.52%	0.39%	0.29%	0.14%	0.14%
Los Angeles MSA	Other RE - Adjust.	0.39%	0.65%	0.81%	0.79%	0.73%	0.64%	0.54%	0.47%	0.35%	0.35%
Los Angeles MSA	Credit Card	1.07%	1.70%	2.10%	2.05%	1.92%	1.69%	1.44%	1.26%	0.98%	0.98%
Los Angeles MSA	Other Consumer	0.77%	1.58%	2.09%	2.03%	1.86%	1.56%	1.24%	1.00%	0.64%	0.64%

PREDICTIVE INPUTS



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PREDICTIVE INPUTS

HPI Impact by Year - Cyclical Assumptions											
	Yr 0	Yr 1 2019	Yr 2 2020	Yr 3 2021	Yr 4 2022	Yr 5 2023	Yr 6 2024	Yr 7 2025	Yr 8 2026	Yr 9 2027	Yr 10 2028
California											
Appreciation/(Depreciation) %		-14.4%	-26.8%	-1.9%	-4.7%	-4.5%	11.6%	18.4%	7.6%	7.8%	6.9%
LTV %	90%	101%	133%	127%	123%	125%	107%	84%	73%	59%	47%
Severity %		26%	58%	51%	47%	50%	31%	15%	15%	15%	15%
CDR %		0.4%	1.0%	1.5%	1.5%	1.3%	1.1%	0.8%	0.6%	0.3%	0.3%
Losses %		0.0%	0.0%	0.1%	0.6%	0.8%	0.8%	0.7%	0.4%	0.1%	0.1%
Los Angeles MSA											
Appreciation/(Depreciation) %		-11.0%	-25.2%	-0.9%	-2.9%	-4.9%	10.1%	16.5%	7.5%	8.5%	5.2%
LTV %	90%	98%	126%	118%	110%	110%	91%	68%	54%	39%	29%
Severity %		22%	50%	43%	35%	34%	15%	15%	15%	15%	15%
CDR %		0.4%	1.2%	1.6%	1.6%	1.4%	1.1%	0.8%	0.6%	0.3%	0.3%
Losses %		0.0%	0.0%	0.1%	0.7%	0.8%	0.6%	0.6%	0.2%	0.2%	0.2%

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DISCOUNTED CASH FLOW ANALYSIS

KEY VALUATION INPUTS:

- Conditional Repayment (CRR)
- Conditional Default Rate (CDR)
- Conditional Prepayment Rate (CPR = CRR + CDR)
- Loss Severity
- Discount Rate – depends on accounting context – for CECL it is original yield

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LOAN EXAMPLE – 660-719 FICO

Loan Example - 660-719 FICO group
Sched. P&I payment $37,680.50

Discounted Losses	Annual CRR%	Annual CDR%	Annual Severity%
$ 75,927	6.0%	1.0%	20%

Valuation Month	Loan Payment Month	Remaining Loan Balance	Actual Amort	Voluntary Prepays	Repo Prin Recoveries	Total Prin Collected	Interest	Total P&I Collected	DQ Balance	Repo Balance	Liquidations	Repo Prin Losses	Monthly CRR%	Monthly CDR%	Monthly Severity%
0	81	6,525,000								-					
1	82	6,478,309	13,201	33,490	-	46,691	24,448	71,139	5,463	-	-	-	0.51%	0.08%	20%
2	83	6,431,916	13,171	33,222	-	46,393	24,253	70,646	10,882	-	-	-	0.51%	0.08%	20%
3	84	6,385,819	13,141	32,956	-	46,097	24,059	70,156	16,257	-	-	-	0.51%	0.08%	20%
4	85	6,340,016	13,112	32,691	-	45,803	23,866	69,669	21,590	-	-	-	0.51%	0.08%	20%
5	86	6,294,505	13,082	32,428	-	45,511	23,674	69,185	26,879	-	-	-	0.51%	0.08%	20%
6	87	6,249,285	13,053	32,167	-	45,220	23,484	68,704	32,126	-	-	-	0.51%	0.08%	20%
7	88	6,204,354	13,023	31,908	-	44,931	23,295	68,226	31,869	5,463	-	-	0.51%	0.08%	20%
8	89	6,159,710	12,994	31,650	-	44,644	23,107	67,751	31,613	10,882	-	-	0.51%	0.08%	20%
9	90	6,115,351	12,965	31,394	-	44,359	22,920	67,279	31,358	16,257	-	-	0.51%	0.08%	20%
10	91	6,065,813	12,935	31,140	4,370	48,445	22,735	71,180	31,105	16,127	5,463	1,093	0.51%	0.08%	20%
11	92	6,016,601	12,906	30,887	4,335	48,129	22,551	70,679	30,854	15,998	5,419	1,084	0.51%	0.08%	20%
12	93	5,967,712	12,877	30,636	4,300	47,814	22,368	70,182	30,605	15,869	5,376	1,075	0.51%	0.08%	20%
13	94	5,919,144	12,848	30,387	4,266	47,501	22,186	69,687	30,357	15,742	5,332	1,066	0.51%	0.08%	20%
14	95	5,870,896	12,819	30,139	4,232	47,190	22,005	69,196	30,111	15,615	5,290	1,058	0.51%	0.08%	20%
15	96	5,822,966	12,790	29,893	4,198	46,881	21,826	68,707	29,867	15,489	5,247	1,049	0.51%	0.08%	20%
16	97	5,775,351	12,762	29,649	4,164	46,574	21,648	68,222	29,624	15,364	5,205	1,041	0.51%	0.08%	20%
17	98	5,728,049	12,733	29,406	4,130	46,269	21,471	67,740	29,383	15,240	5,163	1,033	0.51%	0.08%	20%
18	99	5,681,059	12,704	29,165	4,097	45,966	21,295	67,261	29,143	15,116	5,121	1,024	0.51%	0.08%	20%
19 - 280	100 - 360	0	2,507,970	2,676,847	396,993	5,581,811	1,966,882	7,548,693	-	-	496,241	99,248	0.51%	0.08%	20%
Total			2,741,087	3,240,056	435,085	6,416,229	2,378,073	8,794,302			543,856	108,771	0.51%	0.08%	20%

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DISCOUNTED CASH FLOW ANALYSIS

Loan Type	Payment Status	Credit Score	LTV Status	LTV %	Ending Balance	Annual Prepay % (CRR)	Annual Default % (CDR)	Loss Severity %	Avg Life	Gross Future Losses	Discount Rate (WAC)	Discounted Future Losses	Discounted Lifetime Future Losses %	Discounted Annual Future Losses %
Fixed	Current	720+	Under 50%	45%	13,500,000	10.0%	0.0%	0%	7.0	-	4.0%	-	0.0%	0.0%
	Current	720+	50% - 75%	65%	9,450,000	9.0%	0.1%	0%	7.1	-	4.0%	-	0.0%	0.0%
	Current	720+	75% - 100%	85%	5,400,000	8.0%	0.1%	6%	7.6	2,416	4.0%	1,793	0.0%	0.0%
	Current	720+	100% - 120%	115%	3,150,000	7.0%	0.4%	30%	8.0	30,865	4.0%	22,510	0.7%	0.1%
	Current	720+	120% - 150%	140%	1,350,000	4.0%	1.3%	43%	9.5	71,685	4.0%	49,327	3.7%	0.4%
	Current	720+	Over 150%	175%	450,000	4.0%	1.8%	54%	9.0	39,790	4.0%	27,902	6.2%	0.7%
Repeat for FICO Buckets														
	Current	660-719	by LTV bucket	101%	6,525,000	6.0%	1.0%	20%	8.2	108,771	4.5%	75,927	1.2%	0.1%
	Current	620-659	by LTV bucket	70%	2,115,000	5.0%	3.5%	0%	8.0	-	5.0%	-	0.0%	0.0%
	Current	500-619	by LTV bucket	88%	1,350,000	4.0%	13.0%	9%	6.0	90,243	5.5%	65,452	4.8%	0.8%
	Current	Under 500	by LTV bucket	85%	1,462,500	4.0%	20.0%	6%	5.0	86,463	5.5%	66,066	4.5%	0.9%
	Delinquent	30-59 days		70%	45,000	4.0%	30.0%	0%	4.1	-	4.0%	-	0.0%	0.0%
	Delinquent	60-89 days		88%	135,000	2.0%	50.0%	9%	3.3	18,928	4.0%	16,649	12.3%	3.8%
	Delinquent	90+ days		85%	67,500	2.0%	75.0%	6%	2.7	7,994	4.0%	7,195	10.7%	4.0%
ARM	repeat all FICO & LTV buckets above			125%	30,000,000	8.0%	2.5%	36%	6.0	1,620,000	4.2%	1,269,286	4.2%	0.7%
Total Mortgages				95%	75,000,000	7.9%	2.1%	19%	6.8	2,077,155	4.2%	1,602,106	2.1%	0.3%

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DISCOUNTED CASH FLOW ANALYSIS

DCF MODELING ADVANTAGES:

- Widely used and the math is standardized - SIFMA
- Technique explicitly includes voluntary prepayments
- Models are prospective in nature
    - Current economic conditions relatively easily implemented
        - Base case run with current FICOs and updated CLTVs
    - Change in economic conditions relatively easily implemented
        - Near-term forecasts for unemployment and change in housing prices
- DCF model inputs can be based on industry-wide data adjusted for financial institution's own experience
- Uses key credit indicators that financial institutions use to make loans facilitating communication across the organization

DISCOUNTED CASH FLOW ANALYSIS

OTHER USES FOR DCF MODELING:

- Technique can be used for capital stress testing
- Results of capital stress testing can be used to set quantitative concentration limits
- Technique relatively easily adapted to risk-based pricing and real return analyses
- Inputs can be integrated into ongoing ALM modeling to determine interrelated risks

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CAPITAL STRESS TESTING - CREDIT

		Base			Mid-Stress			Max Stress		
Loan Category	Balance	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio
New Vehicle - Direct	50,000,000	100,601	0.20%	0.01%	113,710	0.23%	0.01%	125,645	0.25%	0.01%
Used Vehicle - Direct	50,000,000	341,920	0.68%	0.03%	405,474	0.81%	0.03%	457,622	0.92%	0.04%
New Vehicle - Indirect	75,000,000	504,161	0.67%	0.04%	561,793	0.75%	0.04%	615,706	0.82%	0.05%
Used Vehicle - Indirect	75,000,000	1,008,952	1.35%	0.08%	1,158,644	1.54%	0.09%	1,291,239	1.72%	0.10%
Total Vehicles	250,000,000	1,955,635	0.78%	0.17%	2,239,622	0.90%	0.18%	2,490,212	1.00%	0.20%
Fixed Rate Mortgage	300,000,000	1,835,005	0.61%	0.15%	5,457,824	1.82%	0.44%	9,161,662	3.05%	0.73%
ARM	150,000,000	480,000	0.32%	0.04%	1,656,062	1.10%	0.13%	5,352,943	3.57%	0.43%
Home Equity	50,000,000	310,423	0.62%	0.02%	599,056	1.20%	0.05%	1,287,246	2.57%	0.10%
HELOC	50,000,000	109,838	0.22%	0.01%	212,501	0.43%	0.02%	551,142	1.10%	0.04%
Total Real Estate	550,000,000	2,735,266	0.50%	0.23%	7,925,443	1.44%	0.63%	16,352,993	2.97%	1.31%
Credit Card	100,000,000	3,046,598	3.05%	0.24%	3,516,541	3.52%	0.28%	4,030,767	4.03%	0.32%
Commercial	50,000,000	407,492	0.81%	0.03%	642,816	1.29%	0.05%	839,108	1.68%	0.07%
Other Consumer	50,000,000	1,031,567	2.06%	0.08%	1,212,913	2.43%	0.10%	1,391,954	2.78%	0.11%
Total Loans	1,000,000,000	9,176,558	0.92%	0.73%	15,537,334	1.55%	1.24%	25,105,035	2.51%	2.01%
Current Net Worth Ratio				9.00%			9.00%			9.00%
Adjusted Net Worth Ratio (add back existing ALLL)				9.60%			9.60%			9.60%
Net Worth Ratio After Credit Losses				8.87%			8.36%			7.59%
Change in Net Worth to Account for Losses				-0.13%			-0.64%			-1.41%

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CAPITAL STRESS TESTING - CREDIT

Loan Category	Current Balance	Concentration % of Net Worth	Proposed Limit	Balance at Proposed Limit	Base: Credit Losses $	Base: Credit Losses %	Base: Decrease in NW Ratio
Example #1 - Current Concentration							
Fixed Rate Mortgage	**300,000,000**	**266.67%**	**266.67%**	**300,000,000**	**1,835,005**	**0.61%**	**0.15%**
Low Risk	*239,773,205*	*213.13%*	*213.13%*	*239,773,205*	*149,902*	*0.06%*	*0.012%*
Medium Risk	*38,309,737*	*34.05%*	*34.05%*	*38,309,737*	*550,619*	*1.44%*	*0.044%*
High Risk	*21,917,058*	*19.48%*	*19.48%*	*21,917,058*	*1,134,484*	*5.18%*	*0.091%*
Example #2 - Prime Focused Lending							
Fixed Rate Mortgage	**300,000,000**	**266.67%**	**266.67%**	**300,000,000**	**957,738**	**0.32%**	**0.08%**
Low Risk	*151,365,732*	*134.55%*	*235.00%*	*264,375,000*	*165,283*	*0.06%*	*0.013%*
Medium Risk	*95,524,467*	*84.91%*	*25.00%*	*28,125,000*	*404,236*	*1.44%*	*0.032%*
High Risk	*53,109,800*	*47.21%*	*6.67%*	*7,500,000*	*388,219*	*5.18%*	*0.031%*
Example #3 - Non Credit Selective Lending							
Fixed Rate Mortgage	**300,000,000**	**266.67%**	**266.67%**	**300,000,000**	**6,676,060**	**2.23%**	**0.53%**
Low Risk	*151,365,732*	*134.55%*	*88.89%*	*100,000,000*	*62,518*	*0.06%*	*0.005%*
Medium Risk	*95,524,467*	*84.91%*	*88.89%*	*100,000,000*	*1,437,283*	*1.44%*	*0.115%*
High Risk	*53,109,800*	*47.21%*	*88.89%*	*100,000,000*	*5,176,259*	*5.18%*	*0.414%*

WILARY WINN LLC

CONCENTRATION RISK POLICY

DETERMINING CONCENTRATION SUB-LIMIT

Loan Category	Current Balance	Current Concentration % of Net Worth	Proposed Limit	Balance at Proposed Limit	Loan Growth within Limit
Fixed Rate Mortgage	**300,000,000**	**266.67%**	**306.67%**	**345,000,000**	**45,000,000**
Low Risk	*239,773,205*	*213.13%*	*245.10%*	*275,739,186*	*35,965,981*
Medium Risk	*38,309,737*	*34.05%*	*39.16%*	*44,056,198*	*5,746,461*
High Risk	*21,917,058*	*19.48%*	*22.40%*	*25,204,616*	*3,287,559*

WILARY WINN LLC

TESTING CONCENTRATION LIMITS

		Base			Mid-Stress			Max Stress		
Loan Category	Balance at Proposed Limit	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio
New Vehicle - Direct	73,125,000	275,131	0.38%	0.02%	310,376	0.42%	0.02%	342,315	0.47%	0.03%
Used Vehicle - Direct	73,125,000	604,568	0.83%	0.05%	716,733	0.98%	0.06%	808,679	1.11%	0.06%
New Vehicle - Indirect	95,625,000	788,092	0.82%	0.06%	877,526	0.92%	0.07%	960,940	1.00%	0.08%
Used Vehicle - Indirect	95,625,000	913,701	0.96%	0.07%	1,052,691	1.10%	0.08%	1,177,206	1.23%	0.09%
Total Vehicles	337,500,000	2,581,493	0.76%	0.22%	2,957,326	0.88%	0.24%	3,289,140	0.97%	0.26%
Fixed Rate Mortgage	345,000,000	2,110,256	0.61%	0.17%	6,276,498	1.82%	0.50%	10,535,911	3.05%	0.84%
ARM	172,500,000	552,000	0.32%	0.04%	1,904,471	1.10%	0.15%	6,155,884	3.57%	0.49%
Home Equity	57,500,000	356,987	0.62%	0.03%	688,915	1.20%	0.06%	1,480,333	2.57%	0.12%
HELOC	57,500,000	126,314	0.22%	0.01%	244,376	0.43%	0.02%	633,813	1.10%	0.05%
Total Real Estate	632,500,000	3,145,556	0.50%	0.27%	9,114,259	1.44%	0.73%	18,805,942	2.97%	1.50%
Credit Card	115,000,000	3,503,588	3.05%	0.28%	4,044,022	3.52%	0.32%	4,635,382	4.03%	0.37%
Commercial	57,500,000	468,616	0.81%	0.04%	739,238	1.29%	0.06%	964,975	1.68%	0.08%
Other Consumer	57,500,000	1,186,302	2.06%	0.09%	1,394,850	2.43%	0.11%	1,600,747	2.78%	0.13%
Total Loans	1,200,000,000	10,885,554	0.91%	0.87%	18,249,696	1.52%	1.46%	29,296,185	2.44%	2.34%

	Base	Mid-Stress	Max Stress
Net Worth Ratio After Credit Losses	8.73%	8.14%	7.26%
Net Worth Ratio Target	7.50%	7.50%	7.50%
Net Worth Ratio Cushion	1.23%	0.64%	-0.24%
Pass/Fail	Pass	Pass	Fail

WILARY WINN LLC

TESTING CONCENTRATION LIMITS

		Base			Mid-Stress			Max Stress		
Loan Category	Balance at Proposed Limit	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio	Credit Losses $	Credit Losses %	Decrease in NW Ratio
New Vehicle - Direct	73,125,000	275,131	0.38%	0.02%	310,376	0.42%	0.02%	342,315	0.47%	0.03%
Used Vehicle - Direct	73,125,000	604,568	0.83%	0.05%	716,733	0.98%	0.06%	808,679	1.11%	0.06%
New Vehicle - Indirect	95,625,000	788,092	0.82%	0.06%	877,526	0.92%	0.07%	960,940	1.00%	0.08%
Used Vehicle - Indirect	95,625,000	913,701	0.96%	0.07%	1,052,691	1.10%	0.08%	1,177,206	1.23%	0.09%
Total Vehicles	337,500,000	2,581,493	0.76%	0.22%	2,957,326	0.88%	0.24%	3,289,140	0.97%	0.26%
Fixed Rate Mortgage	285,000,000	1,743,255	0.61%	0.14%	5,184,933	1.82%	0.41%	8,703,579	3.05%	0.70%
ARM	142,500,000	456,000	0.32%	0.04%	1,573,259	1.10%	0.13%	5,085,296	3.57%	0.41%
Home Equity	50,000,000	310,423	0.62%	0.02%	599,056	1.20%	0.05%	1,287,246	2.57%	0.10%
HELOC	50,000,000	109,838	0.22%	0.01%	212,501	0.43%	0.02%	551,142	1.10%	0.04%
Total Real Estate	527,500,000	2,619,516	0.50%	0.22%	7,569,749	1.44%	0.61%	15,627,263	2.96%	1.25%
Credit Card	115,000,000	3,503,588	3.05%	0.28%	4,044,022	3.52%	0.32%	4,635,382	4.03%	0.37%
Commercial	57,500,000	468,616	0.81%	0.04%	739,238	1.29%	0.06%	964,975	1.68%	0.08%
Other Consumer	57,500,000	1,186,302	2.06%	0.09%	1,394,850	2.43%	0.11%	1,600,747	2.78%	0.13%
Total Loans	1,095,000,000	10,359,514	0.95%	0.83%	16,705,185	1.53%	1.34%	26,117,506	2.39%	2.09%

	Base	Mid-Stress	Max Stress
Net Worth Ratio After Credit Losses	8.77%	8.26%	7.51%
Net Worth Ratio Target	7.50%	7.50%	7.50%
Net Worth Ratio Cushion	1.27%	0.76%	0.01%
Pass/Fail	Pass	Pass	Pass

WILARY WINN LLC

TESTING CONCENTRATION LIMITS

MORTGAGE INSURANCE COULD BE AN ALTERNATIVE TO MITIGATE CREDIT RISK

- Most common is borrower paid mortgage insurance with monthly premiums incorporated into cost of mortgage payment
- Insurance benefit is permissible in loss modeling under CECL if insured at the loan level
- Insurance protects against increased losses during economic downturn and periods of depreciating housing values

WILARY WINN LLC

MORTGAGE INSURANCE EFFECT

ESTIMATED LOSSES – BASE ECONOMIC ENVIRONMENT

30-Year Fixed Rate Mortgage - Estimated Total Loss %

LTV	760+	740-759	720-739	700-719	680-699	660-679	640-659	620-639
97%-95%	0.08%	0.10%	0.12%	0.22%	0.40%	0.59%	1.25%	2.39%
95%-90%	0.06%	0.07%	0.09%	0.16%	0.28%	0.40%	0.87%	1.68%
90%-85%	0.05%	0.06%	0.07%	0.13%	0.22%	0.33%	0.76%	1.50%
79%-85%	0.04%	0.04%	0.05%	0.08%	0.15%	0.22%	0.51%	1.02%

30-Year Fixed Rate Mortgage - Estimated Total Loss % with Insurance

LTV	Coverage	760+	740-759	720-739	700-719	680-699	660-679	640-659	620-639
97%-95%	35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%
97%-95%	25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%
97%-95%	18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.04%
95%-90%	30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%
95%-90%	25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%
95%-90%	16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.05%
90%-85%	25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.04%
90%-85%	12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.09%
79%-85%	12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.04%
79%-85%	6%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.08%

MORTGAGE INSURANCE EFFECT

INSURANCE COVERAGE OF ESTIMATED LOSSES – BASE ECONOMIC ENVRIONMENT

30-Year Fixed Rate Mortgage - Estimated Total Loss Coverage with Insurance									
LTV	**Coverage**	**760+**	**740-759**	**720-739**	**700-719**	**680-699**	**660-679**	**640-659**	**620-639**
97%-95%	**35%**	100%	100%	100%	100%	100%	100%	99%	99%
97%-95%	**25%**	100%	100%	100%	100%	100%	100%	99%	99%
97%-95%	**18%**	100%	100%	100%	100%	100%	100%	99%	98%
95%-90%	**30%**	100%	100%	100%	100%	100%	100%	99%	98%
95%-90%	**25%**	100%	100%	100%	100%	100%	100%	99%	98%
95%-90%	**16%**	100%	100%	100%	100%	100%	99%	98%	97%
90%-85%	**25%**	100%	100%	100%	100%	100%	100%	99%	98%
90%-85%	**12%**	100%	100%	100%	100%	99%	99%	97%	94%
79%-85%	**12%**	100%	100%	100%	100%	100%	99%	99%	96%
79%-85%	**6%**	100%	100%	100%	100%	99%	99%	96%	92%

WILARY WINN LLC

MORTGAGE INSURANCE EFFECT

ESTIMATED LOSSES – ADVERSE ECONOMIC ENVIRONMENT

30-Year Fixed Rate Mortgage - Estimated Total Loss %

LTV	760+	740-759	720-739	700-719	680-699	660-679	640-659	620-639
97%-95%	1.82%	2.26%	3.23%	6.92%	11.72%	15.71%	21.33%	26.74%
95%-90%	1.31%	1.61%	2.21%	4.86%	9.87%	13.62%	19.23%	24.69%
90%-85%	0.80%	0.98%	1.35%	2.89%	6.19%	9.49%	14.49%	19.83%
79%-85%	0.49%	0.60%	0.82%	1.75%	3.82%	6.32%	10.22%	14.82%

30-Year Fixed Rate Mortgage - Estimated Total Loss % with Insurance

LTV	Coverage	760+	740-759	720-739	700-719	680-699	660-679	640-659	620-639
97%-95%	35%	0.00%	0.00%	0.00%	0.01%	0.05%	0.92%	4.18%	9.21%
97%-95%	25%	0.00%	0.00%	0.00%	0.02%	0.26%	2.11%	7.03%	12.09%
97%-95%	18%	0.00%	0.00%	0.00%	0.03%	1.07%	4.33%	9.67%	14.88%
95%-90%	30%	0.00%	0.00%	0.00%	0.01%	0.07%	0.79%	3.85%	8.97%
95%-90%	25%	0.00%	0.00%	0.00%	0.01%	0.15%	1.31%	5.28%	10.37%
95%-90%	16%	0.00%	0.00%	0.00%	0.03%	0.87%	3.34%	8.59%	13.84%
90%-85%	25%	0.00%	0.00%	0.00%	0.01%	0.03%	0.19%	2.16%	6.48%
90%-85%	12%	0.00%	0.00%	0.00%	0.02%	0.45%	1.84%	6.22%	11.36%
79%-85%	12%	0.00%	0.00%	0.00%	0.01%	0.04%	0.36%	2.50%	6.76%
79%-85%	6%	0.00%	0.00%	0.00%	0.02%	0.53%	1.93%	5.58%	10.08%

MORTGAGE INSURANCE EFFECT

INSURANCE COVERAGE OF ESTIMATED LOSSES – ADVERSE ECONOMIC ENVIRONMENT

30-Year Fixed Rate Mortgage - Estimated Total Loss Coverage with Insurance									
LTV	**Coverage**	**760+**	**740-759**	**720-739**	**700-719**	**680-699**	**660-679**	**640-659**	**620-639**
97%-95%	**35%**	100%	100%	100%	100%	100%	94%	80%	66%
97%-95%	**25%**	100%	100%	100%	100%	98%	87%	67%	55%
97%-95%	**18%**	100%	100%	100%	100%	91%	72%	55%	44%
95%-90%	**30%**	100%	100%	100%	100%	99%	94%	80%	64%
95%-90%	**25%**	100%	100%	100%	100%	98%	90%	73%	58%
95%-90%	**16%**	100%	100%	100%	99%	91%	75%	55%	44%
90%-85%	**25%**	100%	100%	100%	100%	99%	98%	85%	67%
90%-85%	**12%**	100%	100%	100%	99%	93%	81%	57%	43%
79%-85%	**12%**	100%	100%	100%	100%	99%	94%	76%	54%
79%-85%	**6%**	100%	100%	100%	99%	86%	69%	45%	32%

WILARY WINN LLC

ANALYZING CONCENTRATION RISK

BENEFITS OF STRESS TESTING CREDIT EXPOSURE

- Estimate life of loan credit losses in adverse economic environments
- Quantify credit exposure in concentration policy limits by testing thresholds at fully lent out balances
- Leads to a dynamic process to set concentration risk sub-limits that can be integrated into overall organizational strategy
- Shows interrelated risks when incorporated into ALM (concentration, credit, interest rate, and liquidity risk)
- Adds even more value when integrated into risk-based pricing and real return analyses
- Identify potential ways to mitigate credit risk exposure, including mortgage insurance

CECL RESOURCE CENTER

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RESOURCE CATAGORIES: ALM, Capital Stress Testing, CECL, Concentration Risk Management, Real Return Analyses

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Our CECL Resource Center includes information on implementing the new standard, including the advantages and disadvantages of the modeling techniques that can be used and the data you should be collecting now.

Implementing CECL

CECL requires a financial institution to recognize an allowance for expected life of loan credit losses on day one. CECL represents a significant change in the way financial institutions currently estimate credit losses because it eliminates the probability threshold. As a result, financial institutions will have to revise their current loss estimate models and, in many cases, implement new models. Whatever methodology is used, the standard requires that the loss estimate be based on current and forecasted economic conditions. This white paper describes how financial institutions can benefit by utilizing modeling and financial concepts developed by other industries as they implement CECL. Examples include using discounted cash flow modeling techniques long used by the asset-backed securities industry and static pool analyses used in the insurance field. We conclude by showing how few financial institutions will have sufficient losses to be statistically valid and the importance of supplementing their performance with industry-wide data. This white paper is available below:

Implementing CECL »

Data Collection for CECL

RESOURCE CATEGORIES

- ALM
- ASC 310-30
- Capital Stress Testing
- CECL
- Concentration Risk Management
- Goodwill Impairment
- Mergers & Acquisitions
- Mortgage Banking Derivatives
- Non-Agency MBS
- Non-Maturity Sensitivity Analysis
- Real Return Analyses
- Residential MSRs
- TDRs
- TruPS

https://www.wilwinn.com/resources/cecl-resource-center/

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