The Math Behind Loan Modification

A Webinar for Housing Counselors and Loan Modification Specialists

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Overview

- Types of loan modifications
- Estimating eligibility at intake
  - estimating Debt To Income ratio (DTI)
  - estimating Loan To Value ratio (LTV)
  - estimating the “best-case” loan modification
- Understanding the Net Present Value Test (NPV)
- Understanding an offer
  - confirming full amortization
  - post-modification DTI, a HAMP tier 2 example

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Types of Loan Modifications

Fully-Underwritten Permanent First Lien Loan Modifications:

- HAMP
- HAMP Tier 2
- Fannie Mae/Freddie Mac Standard Modification
- FHA loan modifications (including FHA-HAMP and mods with a "partial claim")
- "In-house" modifications with HAMP-like underwriting requirements

Distinguish from other "modifications" and related foreclosure prevention options:

- "Straight-capitalization" – no change to the contractual terms of the loan
- Fannie Mae/Freddie Mac Streamline modifications – no underwriting
- Temporary modification – interest rate returns to the contractual rate after time
- Forbearance – portion of payment is deferred for a time period but is still owed
- Repayment – arrearages are paid over time *in addition to* the contractual payment
- Refinancing (including HARP and FHA Short Refi) – creates an entirely new loan
- 2MP – for second liens only

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Review – simplified HAMP modification waterfall

- Determine a target payment—31% DTI
- Capitalize arrearages (increasing the principal balance due)
- Change the terms of the loan in the following order to try and reach the target payment…
  - Reduce the interest rate to a step rate with an initial floor of 2% for the first five years
  - Extend the maturity date to a max of 40 years
  - Forbear up to 1/3 of the principal, but not more than enough to bring the interest bearing principal to 100% LTV
- If the target payment was reached, test the NPV
- If NPV positive, offer the borrower a trial plan

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The Intake Interview

(1) Breakdown of the Monthly Mortgage Payment

- You'll want to know principal & interest (P&I), taxes, insurance, and HOA fees (if any)
- A breakdown of P&I is not necessary, but you should ask if the current payment is an interest-only payment

(2) Estimate of Monthly Gross Income by Source

- "Gross-up" non-taxable income by 25% (multiply by 1.25)
- "Gross-up" any net income amounts by 25% (multiply by 1.25)
- "Gross-down" rental income by 25% (multiply by 0.75)
- P&L statements: income = profit + salary +/- certain adjustments
- Unemployment benefits are not counted

(3) Estimate of the Property Value

- A recent appraisal is best, but online tools such as Zillow can provide a rough estimate

(4) Unpaid Mortgage Balance after Capitalization

- If no statement is available, you can roughly estimate the unpaid balance as:

unpaid principal + (number of months delinquent) x (monthly P&I payment)

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Example #1 – The Simple Family

(1) Breakdown of the Monthly Mortgage Payment
- $2115 principal and interest
- $300 property taxes
- $75 homeowner's insurance
- **$2490** total monthly mortgage payment

(2) Gross income by source
- Ms. Simple's paystub shows: $2300/mo. gross income.
- Mr. Simple's SSDI: $1200.
- Because SSDI is non-taxable, gross Mr. Simple's income up to $1500/mo.
- Gross monthly income = **$3800**

(3) Estimate Property Value
- Zillow shows: **$225,000**

(4) Unpaid Mortgage Balance After Capitalization
- Original 30 year mortgage in May 2007 was $275,000 at 8.5% interest
- The Simples paid on time until November 2013, but are now six payments behind. The unpaid principal is $257,731 + $10,962 in unpaid interest.
- Total balance after capitalization would be **$268,693.**

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Estimating DTI and LTV

Calculate current DTI and post-HAMP P&I payment

- Debt / Income = $2490 / $3800 = 0.655 or 65.5% DTI
- Post-HAMP Total Payment: $3800 x 0.31 = $1178 / mo.
- Post-HAMP P&I: Subtract taxes and insurance

  $1178 - $300 - $75 = $803 / mo.

Calculate LTV after Capitalization

- LTV = Unpaid Balance / Property Value
- $268,693/$225,000 = 1.19 = 119% LTV

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Estimate the Monthly Payment of the "Best-Case" Loan Modification

- Where the borrower meets the HAMP eligibility criteria, use HAMP's program limits to test your "Best-Case" loan modification, by finding the lowest allowable monthly payment using a mortgage calculator or MS Excel formula.

- If you know in advance the borrower doesn't qualify for HAMP, for example if their DTI is already below 31%, use the program limits for the next best loan modification for which they could qualify, typically HAMP tier 2 or a Fannie/Freddie standard mod.
  - HAMP tier 2: Principal reduced to 115% LTV, 30 yr PMMS rate + 0.05% (4.25%), 40 years
  - Fannie Mae Standard Mod: Principal reduced to 115% LTV, 4.625% interest, 40 years

- The program limits for HAMP are 2% minimum interest rate, 40 year maximum amortization period, and lowering the interest bearing principal balance to the value of the property.

- For the Simples, we'll assume they are otherwise eligible for HAMP: 2% rate, 40 year amortization, $225,000 interest bearing principal

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Calculating a Monthly Payment

Microsoft Excel
Function for calculating a loan payment
=PMT(rate/12, years*12, -principal, -balance at maturity)
=PMT(.02/12,40*12,-225000,0)
$681.36

Using a Calculator
P: principal, J: monthly interest rate, N: number of months
M = P * (J / (1 - (1 + J)^ -N)).
225000 * ((.02/12) / (1 - (1 + (.02/12))^(-(40*12))
681.36

. . . or use one of the hundreds of mortgage calculators available for free online.

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Compare Results

- Compare the post-HAMP P&I to the payment under the best-case loan modification.
- If the best-case loan mod results in a payment which is **less** than your estimated post-HAMP payment, the borrower is within the range where they may qualify for HAMP. Again, assuming they meet all the other eligibility criteria.
- If the best-case loan mod is more than the post-HAMP P&I, then you can be reasonably confident the loan servicer will not be able to reach an affordable payment by modifying the loan and the borrower should consider other loss mitigation options such as a short sale.
- In the case of the Simples, the best-case loan modification could reduce their P&I payment to $681.36, HAMP only requires that the payment be reduced to $803. So, the Simples may be eligible for a HAMP modification if they meet the other eligibility criteria and the modification is Net Present Value (NPV) positive.

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The Net Present Value Test

- Compare the present value of the proposed modified loan for the investor against the present value of the probability weighted returns to the investor if the loan was not modified.

- Neither the HAMP guidelines nor the GSEs require servicers to disclose all of the inputs used in their NPV tests.

- For homeowner's with "certain mortgages" who are entitled to receive a Right to Request a Modified Mortgage Loan under M.G.L. Ch. 244 s. 35B, state law and regulations require the creditor to conduct a compliant NPV analysis, provide the borrower with the servicer's anticipated recovery at foreclosure, and provide a summary of the NPV analysis along with any denial.

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NPV Factors

Positive Impact on NPV
Higher Credit Score
Decrease in Property Value

Scenario

No re-default -> Present value of the new modified loan

Re-default -> loss from escrow advances and loss from foreclosure

Positive Impact on NPV
Affordability of modification

-

No Modific

Negative Impact on NPV
Lower Credit Score
Increase in Property Value
Borrower Equity

Loss from Foreclosure

Reinstatement

Negative Impact on NPV
Likelihood of reinstating the loan

= NPV

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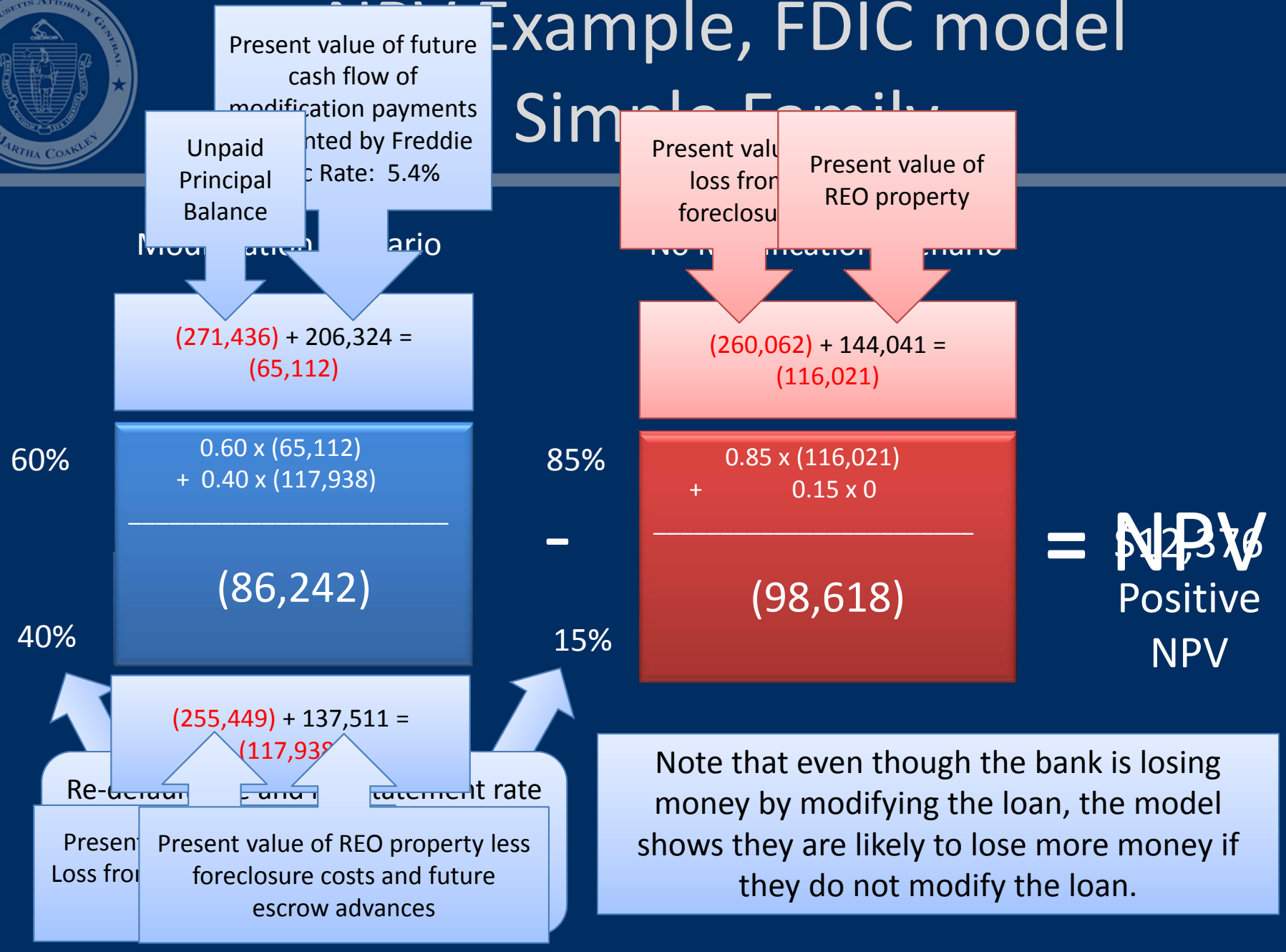
NPV Example, FDIC model Simple Family



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Understanding an Offer—Amortization

- Amortization
  - It's important to understand whether the modified loan payments will completely pay-off the loan by the maturity date. This is called a "fully-amortized" loan.
  - One way to confirm this, is to calculate the fully amortized payment by using the interest bearing principal as the loan balance, along with new interest rate and new maturity date.
  - If these inputs result in a payment that is higher than the proposed modified payment, then the loan does not fully amortize and there will be a balloon payment due at the maturity of the loan. This balloon payment will be in addition to any payment due as a result of principal forbearance.

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Understanding an Offer—Amortization Example

Using a Calculator
P: principal, J: monthly interest rate, N: number of months
M = P * (J / (1 - (1 + J)^ -N))

Example Modification Offer:

$225,000 interest bearing principal, remaining $43,693 forbearance
3.0% fixed interest
30 years
The proposed P&I payment is a fixed payment of $897/mo.

Given these terms the fully amortizing payment should be:

M = P * (J / (1 - (1 + J)^ -N))
M = 225000 * ((0.03/12) / (1 – (1 + (0.03/12))^(-1*(30*12)))
M = $948.61

So, if the Simple's accepted this modification. In 30 years, at maturity there would still be a portion of the interest bearing principal unpaid, in addition to, the $43,693 of principal forbearance.

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Example #2 - Intake

(1) Breakdown of the Monthly Mortgage Payment
- $2015 principal and interest
- $280 property taxes
- $85 homeowner's insurance
- **$2380** total monthly mortgage payment

(2) Gross income by source
- Borrower #1 paystub: $4200/mo. gross income.
- Borrower #2 P&L statement: $200/mo. loss, but draws a $3200/mo. salary
- Rent one bedroom for $900/mo. Rental income grossed down: $675
- Gross monthly income = $8075/mo.

(3) Estimate Property Value
- Zillow shows: **$375,000**

(4) Unpaid Mortgage Balance After Capitalization
- Original 30 year mortgage in June 2006 was $425,000 with an ARM that adjusted to 11%
- Family previously fell behind and had the loan modified to a new balance of $400,000 at 5% interest but have recently fallen behind again.
- Recent statement shows the new balance after capitalization of delinquent interest and third-party fees would approximately $413,000.
- The loan is not owned by Fannie Mae or Freddie Mac

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Example #2 - Analysis

Calculate current DTI and post-modification P&I payment

- Debt / Income = 2380 / 8075 = 0.295 or 29.5% DTI
  - At this point you know that it's unlikely this family will qualify for HAMP tier I because their DTI is already below the target payment
  - However, given the uncertainty with how the underwriter might treat the borrower's profit and loss income, or the rental income, it may be helpful to evaluate the family under both tiers 1 and tier 2 of HAMP.

Calculate LTV after Capitalization

- Unpaid Balance/Prop. Value = $413,000/$375,00 = 1.10 = 110% LTV

Estimate the "best-case" loan modification

- Using HAMP tier 2 program limits: 4.25%, 40 years, reduce principal to 115% LTV

  =PMT(rate/12, years*12, -principal, -balance at maturity)

  =PMT(.0425/12,40*12,-413000,0)

  =1790.85 / mo. is the estimated payment under HAMP tier 2

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Example #2 - Results

- For HAMP tier 2, instead of comparing to the 31% target payment, you want to confirm there was at least a 10% payment reduction and that the post-modification DTI is between 10% and 55%. Post modification DTI includes taxes, insurance, and HOA fees.

- Payment reduction:
  (Prior Payment – Modified Payment) / Prior Payment
  (2380 – 1790) / 2380 = 0.25 = 25% payment reduction

- DTI range:
  10% DTI = 0.10 x $8075 = $807.50
  55% DTI = 0.55 x $8075 = $4441.25
  $1790 P&I + $280 taxes + $80 insurance = $2150
  $2150 is well within the acceptable post-modification DTI range.

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Questions

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