

Dr. Andy Schell, Ph.D., CPA, CMB
Managing Partner

Theresa Marie, CIO
Managing Director



MORTGAGE BANKING
SOLUTIONS

Hedging for Accountants Summary

Confidential
Not for Distribution

From MBS-Team.com Website v.6.22



Dr. Andy Schell, Ph.D., CPA, CMB

Brief Bio:

- 35 years in Mortgage Finance
- Ph.D., CPA, CMB (MBA.org)
- Hedged T-Bonds & MBS in 1984
- Traded Bills & Bonds for Dallas Bank
- Attended University of Chicago Option training
- Freddie MBS in 1988 - MIDANET
- Hedging TBA Settlement for Bank of America
- Hedge Model Validating for FDIC / OCC
- Teach CPAs about hedging
- Advise mortgage lenders across the country



Managing Partner
Mortgage Banking Solutions

“The Profit Doctor”
on Lykken on Lending



Theresa Marie, CIO

Brief Bio:

- 30 years in Mortgage Lending
- Taught Calculus at 16
- Programmed BOLTS at 24
- Chief Information Officer at 28
- Delivered MBS via MIDANET to FHLMC
- Raised Capital on Wall Street
- Designs Algorithms and Programs SQL
- Configures and Programs Encompass
- Leads LOS Implementation Projects w/hedging



Managing Director
Technology & Operations
Metric Banking Solutions



The Hedging Objective is to Preserve Gain on Sale

Hedging Looks Backward to Look Forward
Using Predictive Behavioral Algorithm

Caution: Math and Accounting is Complicated – give yourself time

Today, We Explore HEDGING...



Purpose of Hedging

Preserving the Secondary Margin

Volatility

Interest rates fluctuate on a moment by moment basis

Value Sensitivity

The locked pipeline (IRLC) and warehouse (LHSF) are exposed to interest rate risk from when a loan is lock until it is sold

Margin Preservation

Save the Gain on Sale (Best Efforts or TBA Short)

Hedge

The purpose of a hedge transaction is to create an offsetting financial event that has the direct inverse reaction to the value change of the underlying hedged asset



Hedging Off-Set

- The hedge transaction:
 - Establish a financial transaction that possess the same sensitivity to changes in the interest rate environment
 - But behaves with the opposite impact from rate changes
- LONG IRLC and a LHFS have an inverse movement to rate changes
- SHORT Selling an TBAMBS has a positive correlation to changes in rates. Rates go up, the value of the "short" position goes up
- Being Long and Short in the same transaction offsets the value change impact from changes in the interest rate environment
- Selling a TBA/MBS (SHORT) creates the hedge that preserves the value of the underlying asset. To Be Announced (TBA) Mortgage Backed Security (MBS)



Hedge Activity Measurement

Hedge Reports

The hedge reports present the estimated pipeline profit and loss over a range of interest rates:

- factoring expected changes in market prices and
- pipeline fallout at each level of interest rate movement

Rate Shock Analysis

- Graphically presents position gain or loss across a range of interest rates
- The impact of new locks, canceled locks, loan sales and price movement impact the calculation of this net position

Accountants must understand the shock report!!!



Hedge Complexity

The well known Black-Scholes formula [2] for European call option on underlying assets paying no dividends is

$$c_{BS} = S N(d_1) - X e^{-r\tau} N(d_2) \quad (1)$$

where:

$$d_1 = \frac{\ln(S/X) + (r + \sigma^2/2)\tau}{\sigma\sqrt{\tau}}$$

and

$$d_2 = \frac{\ln(S/X) + (r - \sigma^2/2)\tau}{\sigma\sqrt{\tau}} = d_1 - \sigma\sqrt{\tau}.$$

In the above equations:

c_{BS} is the theoretical price of a European call option on a stock,

S is the stock price,

X is the striking price,

r is the continuously compounded rate of interest,

τ is the time to option expiration,

σ is the volatility (standard deviation of the instantaneous rate of return on the stock),

$N(\cdot)$ is the cumulative standard normal density function.



Inside the Hedging Black Box

Volatility: A range of interest rates options is probability-adjusted based market-implied levels of interest rate volatility

Monte Carlo Simulation: Computes the probability of various interest-rate movements over thousands of occurrences

Statistics Structure: In a normal distribution the greater number of standard deviations the higher the probability

Gain or Loss: Each probability weighted Gain or Loss is then squared and weighted by the probability of the related interest-rate scenario

Downside Risk Adjusted Performance: DRAP is achieved when the Target Gain or Loss is identified and used for the position adjustment



Hedging Position Recommendation

Optimal Balance:

The hedge coverage position recommendation identifies the forward sales of TBA-MBS that will produce the optimal balance of risk and return over a wide range of various interest rates scenarios given the predicted behavior of the IRLC, the LHFS, mandatory commitments and the Open TBA-MBS short position.

What if the predicted behavior changes?

Reading: <https://www.mbs-team.com/education> - Hedging for Mortgage Banking

Hedging is complicated. Hire a competent hedge advisor



What CPAs Need to Know

Reference Tools

Scales of Balance & UnBalance



Scales of Coverage - Balanced

No Adjustment Needed



Pull-Thru Adjusted
Outstanding
Interest Rate
Lock Commitments

Current TBA-MBS
Hedge Coverage



Scales of Coverage - UnBalanced

IRLC **more** than Hedge
Sell more TBA-MBS



Pull-Thru Adjusted
Outstanding
Interest Rate
Lock Commitments

Current TBA-MBS
Hedge Coverage



Scales of Coverage - UnBalanced

IRLC **less** than Hedge
Pair-off TBA-MBS



Pull-Thru Adjusted
Outstanding
Interest Rate
Lock Commitments

Current TBA-MBS
Hedge Coverage



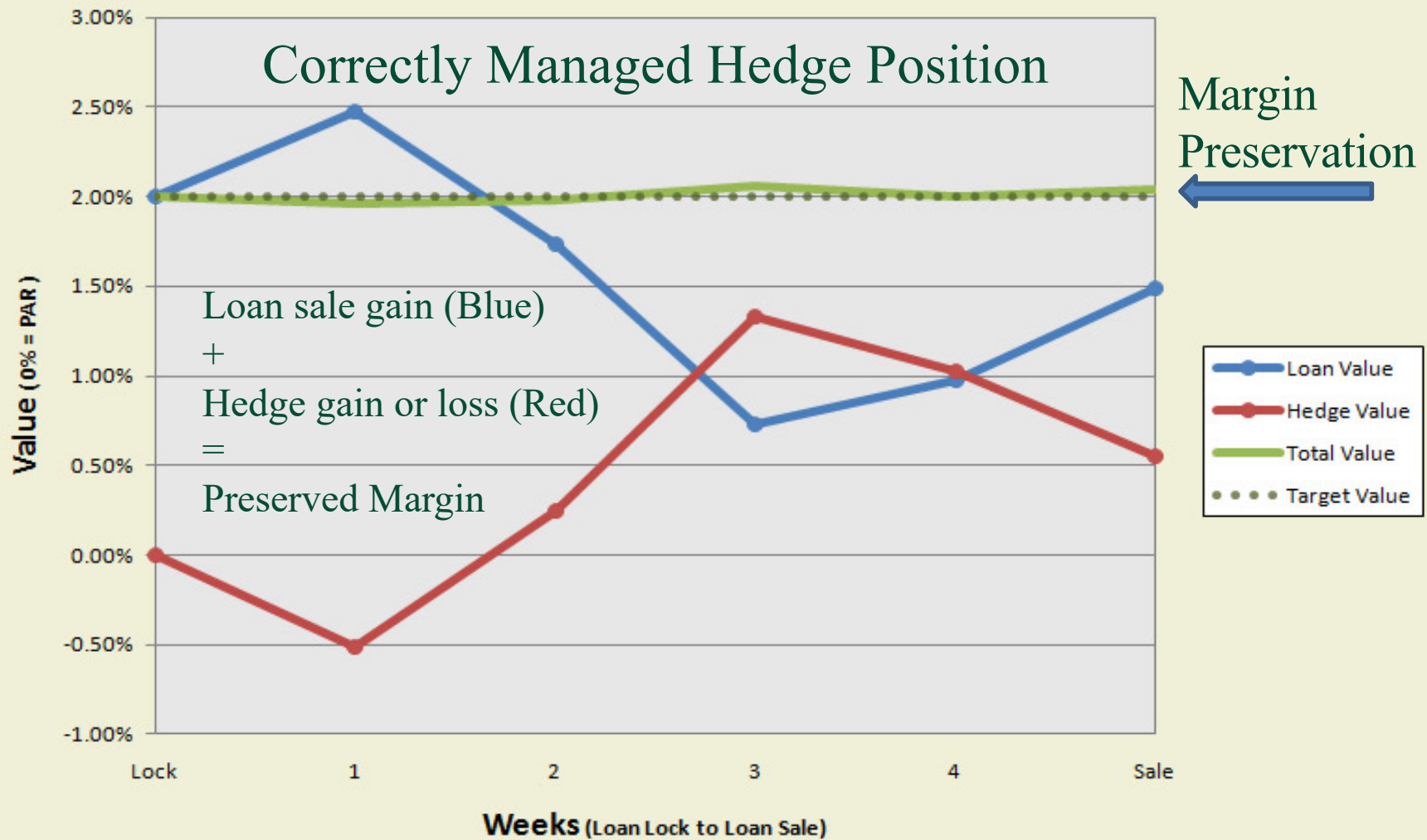
The Perfect Hedge

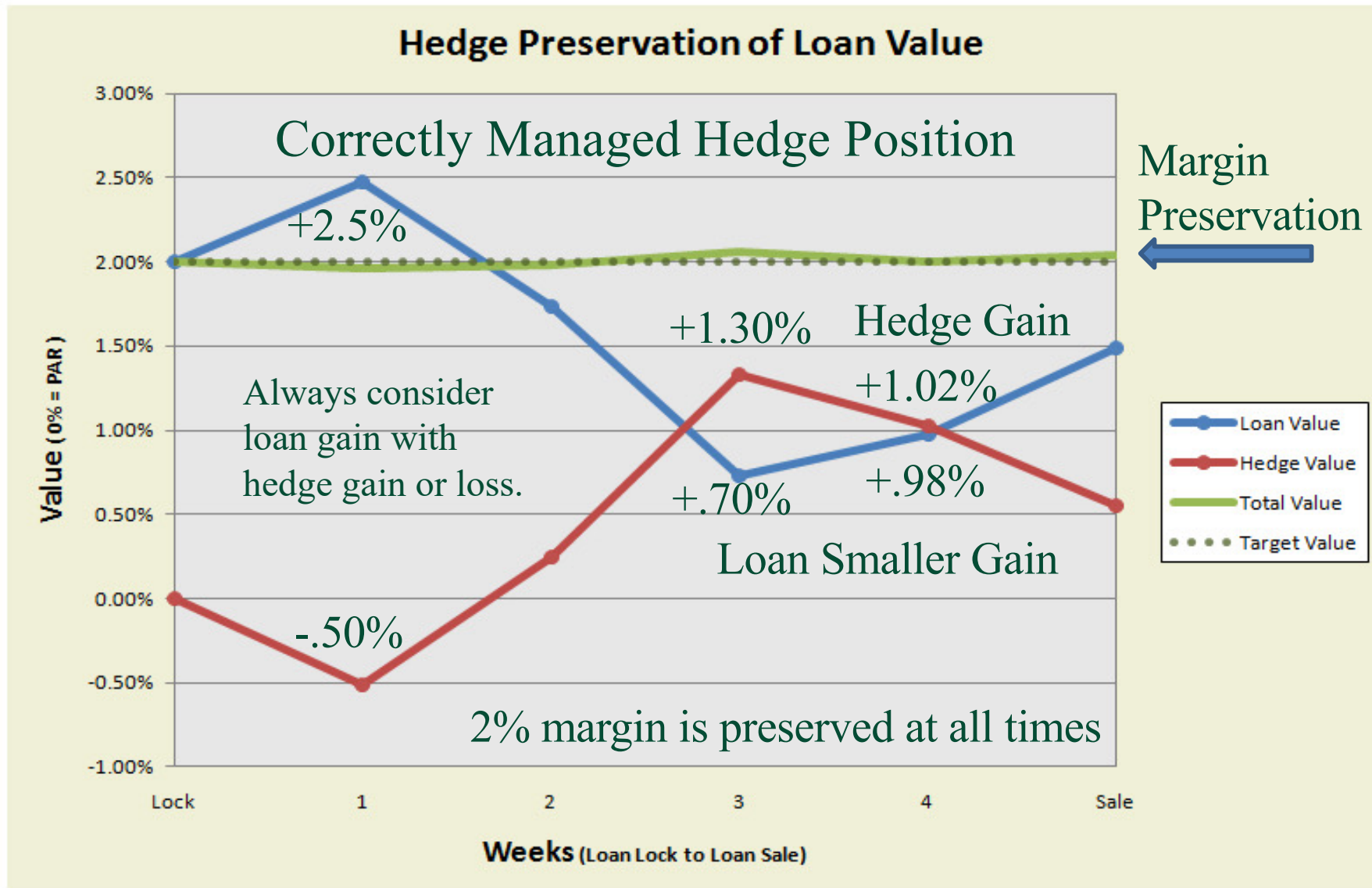
When it all works

If you walk away with two points,
this should be one of them



Hedge Preservation of Loan Value







Hedge Precision



Hedge Model Validation

- The FDIC Bulletin 2011-12 requires a risk model validation report prepared by an independent group.
- We have valuated many hedge models for banks
 - Most well structured models can protect the value at risk
 - If there is accurate pull-thru data
 - And a sophisticated hedge advisor
- Any Model is only as good as:
 - the data
 - the algorithms and
 - the assumptions
- Black Scholes – Option Pricing Model - University of Chicago
 - Assumed Rational Markets



Hedging Reconciliation

- Best Efforts lock registration gain tracking is 1 to 1.
- Hedging is not a loan to loan relationship but a pool of interchangeable loans hedged by a pool of interchangeable commodity transactions.
- The procedure to reconcile the hedging activity to cash is significantly complex and not usually implemented.
- MBS recommends reconciliation via Hedge Advisor reports and a gain tracking procedure.



When Things Don't Work as Expected

When rates rise,
the value of the loan and IRLC falls and
the value of the hedge and the MSR rises and PT improves

But,
what happens when rates rise quickly and the hedge short
coverage reacts less quickly than the long value decline?

Mandatory delivery gains shrink and PO gains don't cover shortfall.

Asymmetric value change may occur in times of high volatility.



Hedging is Complicated

If you are confused:

- read the slides again and
- read Dr Schell's blog (doctorschell.com)
 - Hedging Explained
 - 10 Steps to Launch Hedging
 - CFO Guide to Hedging

If you have more questions:

email Andy@MBS-Team.com

Hedging For Accountants



MORTGAGE BANKING
SOLUTIONS

Andy@MBS-Team.com
512-501-2812

Theresa@MBS-Team.com
512-501-2804

www.MBS-Team.com



WE'VE GOT SOLUTIONS

Client Login

MBS provides Advisory Services in Mortgage Finance

HOME

SERVICES SUMMARY

MBS TEAM

WHAT WE BELIEVE

ARTICLES & VIDEO

CONTACT US

SUCCESS STORIES

Austin, Texas

De Novo Mortgage Lending



- Start a Mortgage Lending Platform
- Implement a Strategy and Find your Purpose
- Position for Excellence
- Address Operational Discord
- Define Values and Build Cooperation
- Implement Goals
- - MORE -

Merger & Acquisition



- Perform Valuation Assessment
- Locate Acquisition Target
- Support LOI and DA
- Coordinate Due Diligence
- Negotiate Deal Points
- - MORE -

Money & Profit



- Make FACT based decisions, not only feeling
- Enhance Profitability - Profit per Loan
- Implement KPI Accountability
- Forecast Profits
- Teach Accounting to CPAs
- - MORE -

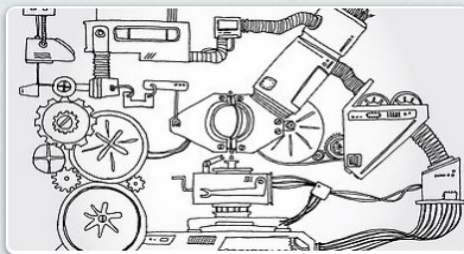
Credit Risk Assessment



MBS helps Commercial Banks evaluate the performance of a mortgage company trying to borrow funds for a warehouse line or MSR financing.

- [MORE](#)

FDIC / OCC / CFPB



Regulatory Compliance is Mandatory

- Mortgage Servicing Rules
- Fair Lending, BSA/AML
- Hedge Model Validation [VIDEO](#)
- Sub-Servicer Verification
- -MORE -

Technology Management



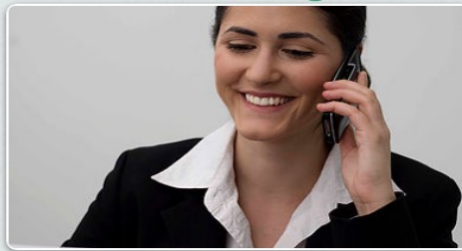
- Accounting Conversion: LVision, AMB, QB
- LOS Negotiation and Deployment
- Comprehensive Project Management
- Regulatory Vender Management
- - [MORE](#) -

Secondary Marketing



- Per-Hedge Assessment
- Launch Hedging Project Management
- Hedge Model Validation [VIDEO](#)
- Hedge Advisor Selection
- Pricing Strategy
- - [MORE](#) -

Loan Servicing



Loan servicing is highly complex and usually undervalued; one of the best kept secrets...

- Servicing vs Sub-Servicing
- Sub-Servicer Validation Requirements for TPM
- Release Servicing or Retain Decision Modeling
- MSR or SRP Accounting
- - [MORE](#) -

Bookkeeping



- Track Loan Level Profit by LO, Product, etc
- MBS Bookkeepers enter your data
- Quickbooks Configuration & Training
- NMLS Report Creation and Submission
- CPA Auditor Interface for lower fees
- - [MORE](#) -