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CHAPTER TWO



MORTGAGE PIPELINE RISK MANAGEMENT

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The role of secondary marketing in mortgage banking garners a tremendous amount of respect due to the complexity and requirements of the job. Most CEO's trust and rely on secondary-marketing executives to manage their company's market position. While pipeline management, in most cases, bears a lot of responsibility, the main objective is to consistently deliver profitable loans to the secondary market while minimizing risk to the company. This chapter will primarily discuss pipeline interest-rate risk management from the perspective of *how to measure performance*.

Webster's dictionary defines hedging as, "a means of defense or protection against financial loss." To a mortgage banker, hedging relates to the purchase or sale of financial instruments. Those financial instruments are designed to neutralize the risk of loss from interest-rate movement on the mortgage pipeline. The pipeline manager's objective is to preserve the profit margin inherent in each loan, without exposing the company to undue interest-rate, basis, and fallout risks.

TYPES OF RISK ASSOCIATED WITH HEDGING MORTGAGE PIPELINES

Interest-Rate Risk

Interest-rate risk involves the possibility that interest rates will rise once a rate lock has been committed to a borrower, but before the loan can be funded and sold to the end investor.

- Interest-rate risk is a direct result of timing delays that occur between setting the loan pricing with borrowers, and setting the loan sale terms with secondary market investors.
- The degree of interest-rate risk varies on a daily basis; as market interest rates fluctuate, pipeline loans are funded, and new locks are guaranteed.
- The key management objective is to balance the amount of exposure to these risks with the appropriate amount and type of coverage.

Fallout Risk

Fallout risk is the risk a borrower will not close on a loan after obtaining a rate lock commitment from the lender. Fallout is the percentage of price-protected locks that cancel, withdraw, or expire as a percentage of the total price-protected locks taken during a fixed period of time.

Several variables can affect a firm's fallout:

- Credit quality of the borrower
- Quality of the underlying collateral
- Change in current interest rates from the date of initial rate lock with the borrower

Basis and Other Risks

- Investor basis risk is whether the market value of a particular loan will respond as expected to changes in Market MBS TBA pricing
- Inaccurate information in the pipeline management system
- Inappropriate hedging strategy
- Pricing strategy and methods
- Control management

SECONDARY MARKETING REPORT CARD

It is important to consider volatility and potential risks when considering mortgage pipeline interest-rate risk hedge models, services, and techniques. Conventional wisdom in the industry maintains that most systems, methods, or techniques perform equally. Unfortunately, this is not the case in most circumstances because the movement or volatility in the market is never tested in a relatively flat interest-rate environment; therefore, the results become entirely dependent on what was priced into the loans initially, and a given system may not perform well during times of high volatility.

The *secondary marketing report card* illustrated below is designed to review secondary-marketing operations on an ongoing basis, and provides a reminder that secondary-marketing results need to be monitored and measured. As mentioned in the appendix to this chapter titled *Ways to Mess Up in Secondary Marketing*, there are a multitude of methods to underperform, and some are very creative; however, monitoring profitability leakage and keeping an eye on the goal should be every secondary-marketing manager's main objective.

There are people in the industry who believe all secondary-marketing systems, hedging services and tools perform equally without the possibility that any one method, system, or service might provide a competitive advantage. This belief is logical in a relatively stable market (as explained above); however, the performance of different systems and strategies is unpredictable in volatile environments. Even companies with the best secondary-marketing grades experience volatility beyond hedging or fallout error. P&Ls are often affected by income-recognition based accounting rules, excessive extension costs, and other issues.

REPORT CARD	RESPONSIBILITY	ACTIVITY	NOTES
1	Hedge Position Management	<ul style="list-style-type: none"> • OAS Analysis Tuned to current Forward Market • Hedge Optimization with VAR and Implied Volatility Probability • OAS Servicing Valuation imbedded in Mark to Market and Shocks • Synthetic Options Valuation • Float-Down Lock Pricing and Management • Position reconciliation on a static and OAS basis • Back-testing of Hedge Ratios • Incorporate Investor Caps and Fallout Progression • Data Clean – no expired and cancelled locks in pipeline 	
2	Fallout Analysis & Reporting	<ul style="list-style-type: none"> • Monthly Actual Fallout Measurement • Renegotiation tracking and fallout measurement • Daily weighted-average Forecast versus monthly actual Fallout 	
3	Timeline Analysis & Reporting	<ul style="list-style-type: none"> • Extension tracking • Days between status analysis and tracking • Info by source, branch, & loan officer • Lock Expiration Management 	
4	Best Execution Analysis	<ul style="list-style-type: none"> • Basis Risk Monitored and considered • All investor pricing modeled and readily available for analysis • Loan-Level versus pooled approach with Stips and Spreads • Investor Extension, Substitution, Pair-off, Roll and Early-Delivery Analysis 	

REPORT CARD	RESPONSIBILITY	ACTIVITY	NOTES
5	Trading	<ul style="list-style-type: none"> • Research and Analysis • Dealer & Conduit Account Maintenance • Executions: Securities, Options, Jumbo, Whole Loan, Servicing • Trade Confirmation Review • Margin-Call Management • Trade Tracking & Reporting • Commitment Tracking & Reporting 	
6	Loan Origination Support	<ul style="list-style-type: none"> • Product Development & Integration • Market & Product Training and Staff Development • Margin Analysis on Non-Hedged Loans 	
7	Lock Desk Management	<ul style="list-style-type: none"> • Pricing & Rate Sheet Distribution • New Locked Loan Spread Tracking • New Lock Review/Audit • Pricing Surveys • Lock Policies & Procedures • Alternate, Exception, and Extension Pricing Requests & Tracking • LO Comp/ Branch Margin Controls 	
8	Gain On Sale Profitability & Reporting	<ul style="list-style-type: none"> • Hedge-Cost Analysis • Settlement Management • Shipping Management • Designations & Securitization 	
9	Investor Relations	<ul style="list-style-type: none"> • Problem-Loan Resolution & Transfers • Investor Contract & Repurchase Negotiations • Audit Interface 	

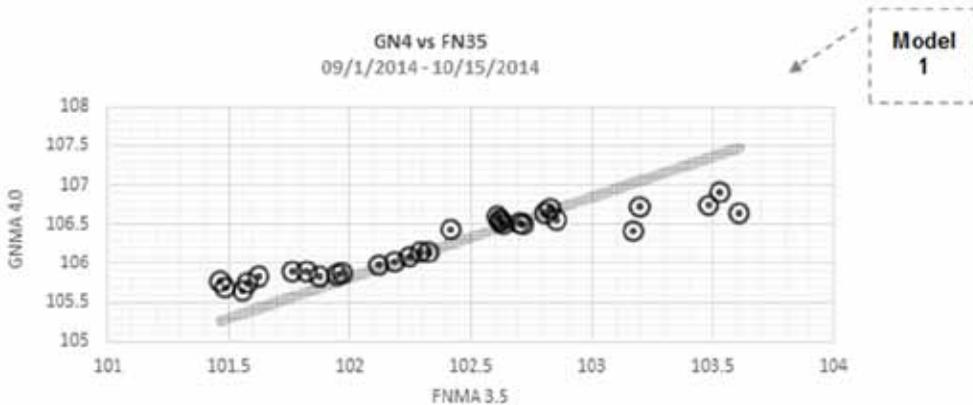
REPORT CARD	RESPONSIBILITY	ACTIVITY	NOTES
10	Miscellaneous	<ul style="list-style-type: none"> • Warehouse Capacity, Management & Review • Secondary Marketing Systems Administration • Secondary Marketing Policies & Procedures • Gestation Line capacity review and inception 	
Overall Assessment			

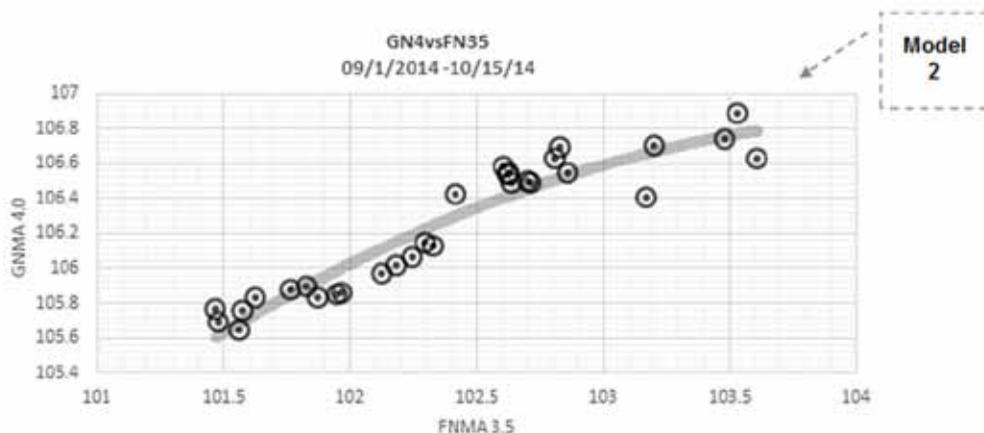
HEDGE POSITION MANAGEMENT

The first section of the report card is titled *Hedge Position Management*, and is meant to gauge the level of accuracy and effectiveness of the model used to hedge the pipeline of loans, and report the mark-to-market levels on a loan-level basis.

OAS Tuned to Current Forward Market refers to evaluating hedge ratios and mortgage valuations. Many firms use a model developed for longer-term holding periods than what is required. For example, if you were looking to value a servicing portfolio, you would use a long-term prepayment forecast with a longer-term holding period, versus one tuned to the forward market, like the sale of loans 60 days out. These assumptions, in conjunction with any forecasted price change, can generate large disparities in hedge-ratio levels and convexity.

Which hedge-ratio system appears to report with better accuracy?





Model 1 demonstrates a visually linear result without incorporating changes in hedge ratio, which produces a wider variance, leaving firms with too much or too little profit.

Model 2, the obvious answer, produces less predictive error, visually tracks changes occurring while demonstrating the convexity of market movement over that period.

The next item on the report card, *Hedge Optimization with VAR and Implied Probability*, relates to the fact that many hedge models attempt to optimize a position within a shock analysis, assuming the probability of a rate change is equal from the current market to the next shock level. In such systems, a 10 basis point yield change is equal in probability to a 50 basis point yield change in terms of probability and application of coverage to the firm's market position exposure.

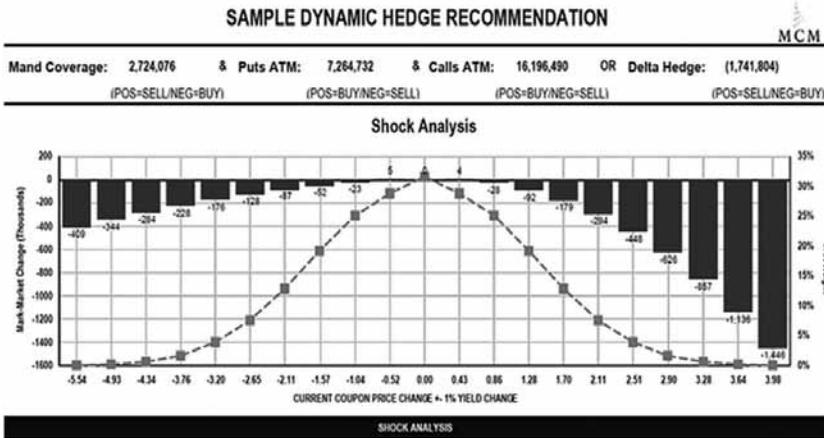
Other models optimize at a specific point along the shock curve — say, +/- 25 basis points — and construct a hedge position assuming an equal probability of market movement over this yield change, ignoring all other market price or yield shocks in their calculations. Still other models do not have the mathematics to deal with anything other than a general duration-weighted construction, wherein they calculate a risk position simply based on a fixed linear hedge ratio.

As you can see, there are many ways to make mistakes in market analysis and hedge construction!

Option-Adjusted Spread with Value at Risk

The best solution available for this issue is a model incorporating Option-Adjusted Spread (OAS) with Value at Risk (VAR), tuned to the current forward market, not a long-term model. The OAS- and VAR-based model incorporates a calculated probability of each potential shock yield change, using the market's assumptions for probability derived from the cost of options. This volatility level contains the market's expectation about the probability of a price change occurring, and therefore can be used to construct an optimal hedge position. Incorrect assumptions about how prices of various mortgage products move in relation to one another, and inappropriate price-change expectations may insure that large hedge errors are likely to occur during times of market volatility.

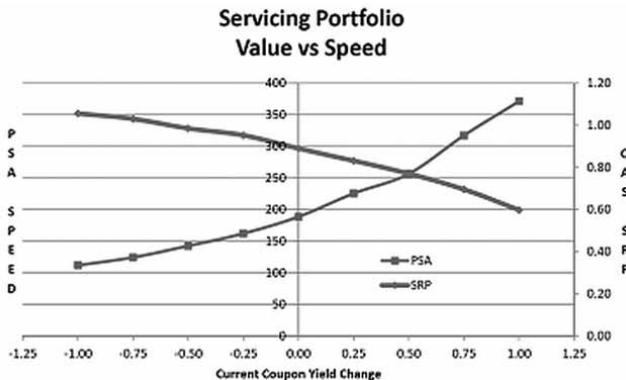
The following provides an example of how such a market shock can be constructed and visually displayed:



OAS Servicing Valuation

Incorporating OAS Servicing Valuation is critical to be able to accurately hedge a position which consists of both loans and the servicing rights associated with those loans. The change in the combined value of a loan and its associated servicing rights will not match the change in value of a TBA MBS forward-sale transaction for a specific yield-change assumption, because the assets have very different convexity profiles. For example, when the price of a FNMA TBA MBS 3.0 goes up 2 points, from 102 to 104, the underlying value of the note, excluding servicing on a loan in a pipeline, will also, in general, go up by two points; however, the value of the loan's servicing will go down. Suppose a loan's servicing value was initially worth 1.25 points; its value may fluctuate downward to 1.00 point after such a market move. Consequently, the unadjusted hedge position would suffer leakage by -25 basis points, even if everything else worked perfectly (assuming a poorly designed model was used that employed only duration-weighted hedge ratios to construct hedge positions).

Other related issues include static linear ratios, investor caps, static fallout ratios, etc. The graph below provides an example of how servicing values change with changes in market yield and expected prepayment rates:



Synthetic Options Valuation

Synthetic Options Valuation is important due to the current lack of availability of MBS TBA options for purchase by mortgage bankers from their respective broker dealers. In the rare instance that these options are available for purchase; they are often priced exceedingly high relative to equivalent CBT 10-year Treasury options.

In order to effectually hedge pipeline market value — especially wherein a high percentage of float-down locks exist, or for a pipeline governed by a lock policy that permits customers to get lower rates, after a market rally — it is necessary to go to the CBT or cash Treasury market and do so in a way that negates the basis risk between MBS Securities and Treasuries. This can be accomplished by using *synthetic puts* in a basis-neutral way, as explained in the appendix to this chapter, titled “Synthetic Puts.” This section is also used to gauge whether a company can use options in their hedge policy, whether they know how to value them, and whether or not they have options valuation as part of the hedge position and mark-to-market.

Float-Down Lock Pricing and Management

Float-Down Lock Pricing and Management is designed to detect how a firm utilizes float-down locks by confirming the options are priced correctly, risk managed appropriately, and whether they are used to originate builder-forward or spot commitment business.

A lock policy that allows the pipeline to be re-priced (given a specific market movement) also poses similar risk levels, and requires appropriate pricing and risk mitigation. The following table provides a sample of float-down pricing over specific periods of time, wherein customers pay for the option to float down upfront, with specific changes to maximum pricing set up-front.

Conforming 30-Year Float-Down Lock Pricing			
Upfront Fee	Period	Rate Adj.	Disc. Adj.
0.250%	90 day	0.250%	0.125%
0.375	120 day	0.250	0.25
0.500	180 day	0.375	0.125
0.750	240 day	0.500	0.250

Position Reconciliation on a Static and OAS Basis

Position Reconciliation on a Static and OAS Basis applies metrics to pipeline changes, including each component between Pipeline Risk Management and Position reports. The objective is to understand the nature of any change that occurs between reports. The idea is to always know how you got into the current position, and not be surprised from one position report to the next.

For example, consider a market position report that is the equivalent of being short \$2 million current-coupon MBS on a static basis, while dynamically flat, before a market movement of one point (with the base hedge ratio OAS derived, but not dynamically

calculated). Later, a new market-position report is issued, with the same pipeline data, but confirming the position to be short \$5 million statically, and \$2 million dynamically.

This outcome could be the result of not having enough option coverage, and would be easy to detect with reconciliation on both a static and dynamic basis.

Back Testing of Hedge Ratios & Fallout

Back Testing of Hedge Ratios & Fallout references two very important aspects of tracking secondary-marketing hedge performance. Hedge ratios are meant to predict the value change of one asset (loan note plus servicing) versus security instruments (e.g., TBA forward sales). The accuracy should be recorded daily and analyzed at least monthly, if not on a bimonthly basis. Daily monitoring and evaluation may still take place, but recent data should be measured monthly.

For example, daily hedge ratios used to predict the value change of FNMA 3.0 (the current coupon) versus GNMA II 3.0's would be very useful in cases where excess GNMA II 3.0 production is hedged with the FNMA 3.0 coupon. Here is a sample for a one-month period during January, 2015:

FNMA30	GN3
Actual Hedge Ratio	0.988
R-Squared	0.909
Average Hedge Ratio	1.029

In this example, the perfect hedge ratio during the period evaluated was .988 during the period. The average hedge ratio used by the model was 1.029, for a variance of .041, meaning, the GNMA 3.0 was .041 percent more volatile than expected. This condition would have resulted in hedge leakage or hedge gain of 4 percent depending on which way the market moved on average during the period for the volume of GN3's hedged with FN3's.

Another important fact to consider is that in any given set of market conditions, a company can be wrong twice and right once. Assume they have fallout error of negative 10 percent, (they close ten percent less loans than forecasted during the period reviewed), and their hedge ratios for closed and locked loans for the same period were off by 10%. This condition could have a positive result from a market change perspective during the period, but a negative result based on fallout and hedge ratios, and thus could be right overall since their wrongs counterbalanced their right market position. But counting on this balance to continue is foolhardy at best!

In addition to hedge-ratio back testing, periodic fallout-model back testing is required, typically during a firm's average lock period. The table below provides a reporting method that illustrates monthly performance of the fallout model on a quarterly basis:

SAMPLE FALLOUT REVIEW									
Month	Locks	Closings	Fallout	%	Reneg. Amt.	%	Actual Total Fallout %	WTD AVG Daily Forsc Ast	Variance
Jul	154,482,706	123,689,458	30,793,248	19.9%	3,543,683	2.3%	19.5%	18.5%	1.0%
Aug	141,346,521	113,043,168	28,303,353	20.0%	5,058,347	3.6%	21.4%	21.0%	0.4%
Sep	167,818,927	141,195,830	26,623,097	15.9%	4,813,504	2.9%	18.9%	18.7%	0.2%
	463,648,154	377,928,456	85,719,698	18.5%	13,415,534	2.9%	19.9%	19.4%	0.5%

This presentation calculates the actual total fallout experienced during a quarter on a monthly basis, and compares the result with the weighted-average daily forecast from the model used to hedge the firm's market position. Please note it includes renegotiated fallout, which measures the amount of fallout from renegotiated loans that close.

In this example, the client's average fallout variance was 0.5% during the period (given the market moved up, on average, due to the possibility of more sold loans at higher prices) causing positive hedge gains, albeit very few, just 0.5% more. The opposite is also true, given a negative market move on average during the period.

Incorporate Investor Caps and Fallout Progression

The question, does your model *Incorporate Investor Caps and Fallout Progression*, generally refers to the fact that investors do not pay more than a certain stated maximum level for loans. For example, a particular investor may have a maximum they are willing to pay an originating seller/servicer, and this level might be 107. Loans with rates and features that would normally be valued higher than this level are said to be capped, and may not have their value change even when market prices decline.

A basic duration-weighted hedge construction model (even one with OAS-based hedge ratios) would overstate the exposure on such loans since they do not fluctuate in value when the market improves or declines over a certain capped range. This behavior causes many models to be inaccurate, particularly when combining other non-linear functions associated with a mortgage pipeline like fallout ratios, mortgage backed security hedge ratios, etc.

Fallout progression refers to the adaptability of a fallout model on a loan-level basis, with loans moving between statuses and market-movement milestones. For example, loans in "approved" or "in process" status may both fall out after a given market movement; however, loans in "documents" status may not, under the same conditions. The "documents" status and market-change progression should be incorporated along with other time-in-status statistics to improve fallout prediction. Although the recent regulatory changes have put a dampener on fallout volatility, borrowers remain sensitive to changes in market pricing, and therefore are renegotiating and causing their loans

to fall out at higher rates when market prices rise, and close at higher rates when prices fall. Fallout is very source-dependent, policy driven, and varies between originators.

Data Integrity

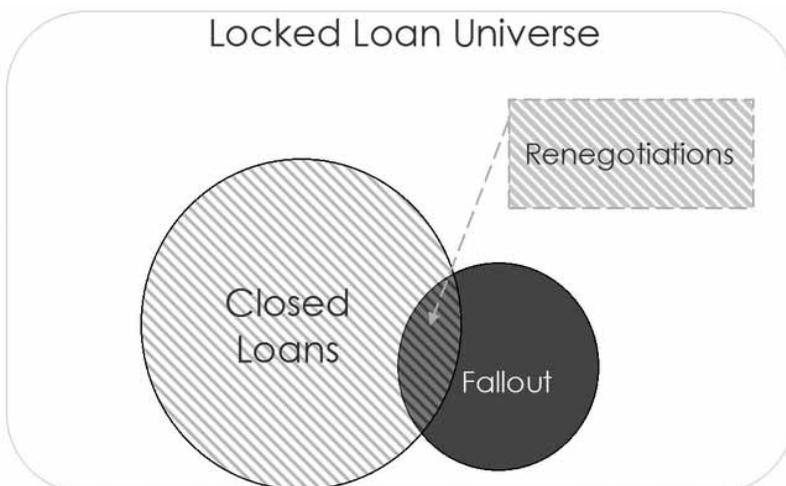
The last section of this area of secondary responsibility refers to *Data Integrity*, with no expired or cancelled locks in the pipeline. Bad information about your pipeline may become difficult and potentially impossible to manage; hedging loans that should be cancelled out or removed from the hedge equation is mandatory to avoid excessive profitability leakage.

This idea should be self-evident, but needs to be tested and verified on an ongoing basis. Basic data-integrity checks by various reporting methodologies, and testing through reconciliation on both a static and OAS basis should be constantly performed by the pipeline risk-management system used by a firm. Hedging loans that have bad data, not hedging loans that should be in the position, or hedging loans that should not be in the position could all result in bad outcomes.

FALLOUT ANALYSIS AND REPORTING

In the next section, *Fallout Analysis and Reporting*, we will discuss pipeline measurement, pipeline tracking, and pipeline reporting. Before one can measure it, one has to define it. Fallout has traditionally been defined as the dollar amount of price- and rate-protected loans that are cancelled, denied, or renegotiated, divided by the total dollar amount of price- and rate-protected loans originated over a specified time period. Loans not locked in with a customer (borrower or loan broker) do not qualify in either the numerator or denominator of the fallout equation, but are ignored, because loans that are not locked in do not cause interest-rate risk to the mortgage banker given any market movement.

Loans that are included are those loans that do contain interest-rate risk to the mortgage banker. The loans' values change according to changes in the secondary market, and therefore are hedged to maintain a targeted profit margin.

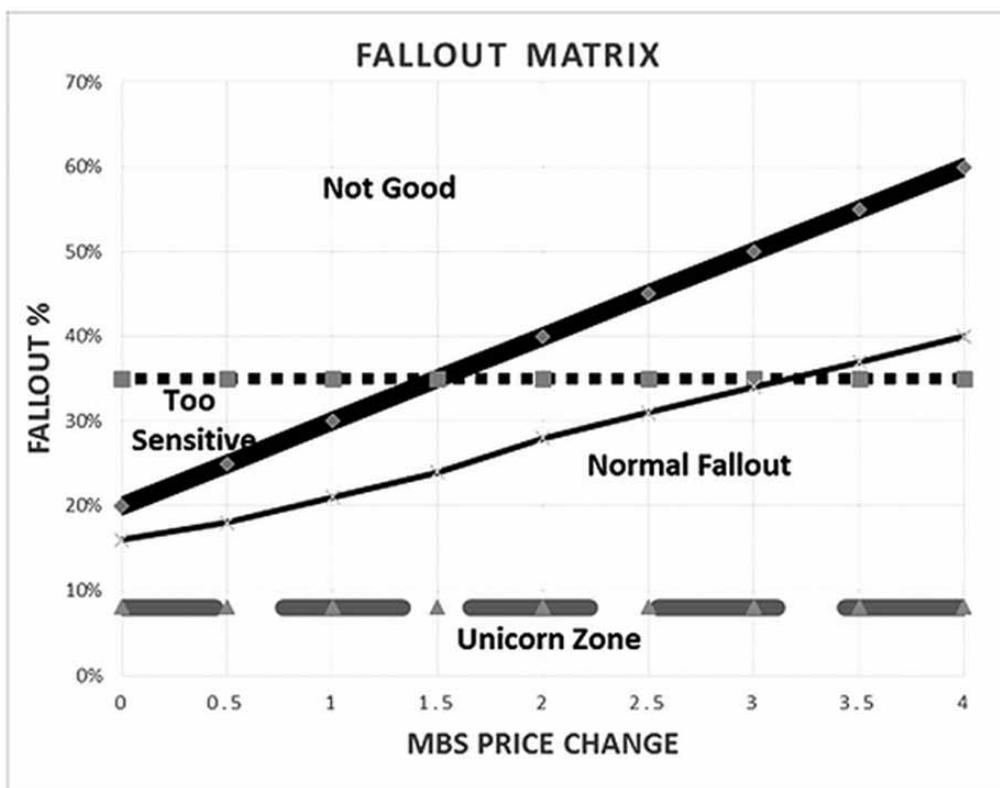


Monthly Actual Fallout Measurement

The *Monthly Actual Fallout Measurement* can be done by either tracking locks originated over a particular time period or locks expiring over a specific period, as long as the periods are discrete. Many firms use the last lock expiration date to group loans, because it is easier to base on this date than the lock date, and the results are quicker to come by for tracking and measurement purposes.

Renegotiation Tracking and Fallout Measurement

The *Renegotiation Tracking and Fallout Measurement* item from the report card is intended to determine whether renegotiations are part of fallout measurement and whether they are being done correctly. When a loan locks in @ 4.5% and -2 points for a particular loan program, then the market improves to where a company's rate sheet shows 4.00% @ -2 points, the potential for a renegotiation exists. If that loan's pricing were to be reduced to 4.00% @ -2 points - a full renegotiation would have deemed to have been executed and the total amount of the loan, although closed, should be counted as fallout. If the loan closes at 4.25% and -2 points, the loan is deemed to be 50% renegotiated, as the yield on the loan went down by 50% of the market move. Renegotiations must also be monitored and tracked for compliance reasons.



The chart above simplifies the fallout review a company might perform by comparing where they fall according to common industry levels as fallout levels change with respect to market movement. The “Unicorn Zone” is meant to depict an area usually not seen, because at least 6% of loans fallout no matter what as they are either denied or do not close. The “Not Good” area represents a pipeline that is too sensitive and would be very expensive to hedge; which, fortunately, is very rare.

Daily Weighted-Average Fallout Forecast

In order to figure out how well a fallout model performs, not only does the actual fallout level including renegotiations need to be tracked, but also a *Daily Weighted Average Fallout Forecast* for loans in the pipeline on a loan-level basis needs to be tracked. For example, every loan's daily fallout forecast needs to be stored so that the forecasted fallout versus the actual can be accumulated over the specific period evaluated. This seems simple enough, but when you get down to the details, a large database needs to be developed to monitor this activity, and must be maintained with very high integrity.

TIMELINE ANALYSIS & REPORTING

Timeline Analysis & Reporting refers to the fact that loans do not always meet their expected processing timeline, and need to have their lock periods extended in order to fund. In some cases, this becomes a borrower's problem when they fail to deliver required documents in a timely manner, but often it is the originator's problem because for whatever reason they failed to ask for the needed documents, or they have a bigger issue with too many loans in process that do not get the attention needed. In either case, the amount of time it takes to move loans from “in process” to “submitted” to “approved” and on to “documents” and “closed” should be tracked and measured.

Collecting information throughout the loan process gives the client better information about how well their processing centers work. It will also collect data that can be traced back to individual processors and loan officers. The information can then be used by a pipeline-management model to calculate expected fallout, measuring how long it takes, on average, for a firm to process loans from one status to the next. Timeline analysis and reporting mitigates risk associated with a loan stuck in one status beyond a normal period of time, causing increased likelihood that the loan will fall out. Extension Tracking, Days between Status Analysis, Info by Source, Branch, and Loan Officer, are all data points provided in a monthly branch-analysis report that looks like the following:

BRANCH ANALYSIS
 (CLOSED LOANS)


BRANCH	# of Locks	Total Amount	% of Closed Pipeline	Avg Orig Lock Period	Avg Final Lock Period	# of Extensions	Avg Extensions	Avg Days To Close	Avg Days IP to Approved	Avg Days Approved to Docs	Avg Days Docs to Closed
BREMERTON BRANCH	131	\$32,442,177.00	2.96%	25	28	30	10	21	6	10	5
CARMEL BRANCH	234	\$70,188,309.00	6.41%	37	40	76	13	34	14	11	8
CHARLOTTE BRANCH	96	\$18,763,574.00	1.71%	25	27	18	10	18	5	9	4
CHICO BRANCH	179	\$37,547,482.00	3.43%	33	38	82	11	34	18	9	6
ELK GROVE BRANCH	342	\$74,652,568.00	6.82%	36	39	133	9	33	19	8	6
EUGENE BRANCH	320	\$61,069,882.00	5.58%	35	39	130	14	34	17	11	6
HAWAII BRANCH	41	\$14,749,163.00	1.35%	42	45	9	15	36	17	12	7
LAS VEGAS BRANCH	157	\$25,893,624.00	2.37%	19	20	17	10	15	2	6	6
LODI BRANCH	311	\$61,038,744.00	5.58%	34	36	73	15	29	12	11	7
MICHIGAN BRANCH	433	\$74,002,938.00	6.76%	28	29	72	15	20	9	8	3
NORTH CAROLINA BRANCH	177	\$31,024,484.00	2.84%	34	37	51	18	30	16	10	4
PORTLAND BRANCH	44	\$8,068,843.00	0.74%	32	38	19	18	31	16	11	4
REDDING BRANCH	135	\$23,231,756.00	2.12%	39	45	56	15	39	18	14	7
RENO BRANCH	277	\$51,789,181.00	4.73%	40	43	71	13	33	17	9	6
ROSEVILLE BRANCH	236	\$72,162,229.00	6.60%	40	46	101	14	41	26	8	7
SACRAMENTO BRANCH	759	\$179,303,915.00	16.39%	33	37	272	14	31	13	10	7
SANTA BARBARA BRANCH	290	\$106,891,418.00	9.77%	37	39	115	7	34	15	11	8
SANTA ROSA BRANCH	96	\$29,208,391.00	2.67%	33	37	34	14	29	13	9	8
SPOKANE BRANCH	20	\$3,522,487.00	0.32%	32	40	16	10	37	25	9	3
VALLEJO BRANCH	105	\$22,736,626.00	2.08%	36	39	37	18	34	19	8	7
VIRGINIA BRANCH	192	\$42,339,719.00	3.87%	34	40	61	18	33	17	11	5
WALNUT CREEK BRANCH	165	\$53,557,364.00	4.89%	28	30	36	11	23	9	8	6
TOTALS:	4,740	\$1,094,184,874.00	100.00%	33	37	1509	13	30	14	10	6

BEST-EXECUTION ANALYSIS

The *Best-Execution Analysis* section gauges the effectiveness of the loan-sale aspect of secondary-marketing and pipeline risk management, i.e., how efficiently and profitably loans are sold into the secondary market. Some firms mistakenly believe that best-execution analysis is done by using a third-party pricing model that looks up a price for each loan based on the loan's criteria and qualifications. This approach results in best price for the data available "at the time" for an individual loan, but ignores other possible executions, and is usually not accurate due to timing.

The table below depicts such an analysis; however, the analysis also includes a comparison to a Bulk sale and AOT with the lack of pair-offs on the securities used to hedge the position. One FNMA30 loan from the group is sold without a LLPA for high balance resulting in a higher overall total price for the group of loans:

PROGRAM	LOAN AMOUNT	RATE	PURPOSE	LTV	INTENT	PROPERTY	STATE	DOCUMENTATION	FICO	CLTV	IMPOUNDS	M/I	LLPA's	BESTx	PRC 1	NEXTx	PRC 2
FNMA30	358,748	4.125	REFINANCE	89.7	00	SFR	CA	FULL DOC	766	89.7	Y		N	-0.25 Investor B	104.396	Investor A	103.14
FNMA30	417,000	4.125	REFINANCE	71.8	00	SFR	CA	FULL DOC	808	71.8	Y		N	-0.25 Investor B	104.646	Investor A	104.55
FNMA30	315,000	4.250	PURCHASE	27.3	00	SFR	CA	FULL DOC	758	27.3	Y		N	0 Investor B	105.548	Investor A	105.15
FNMA30	324,000	4.250	PURCHASE	80.0	00	SFR	CA	FULL DOC	772	80.0	Y		N	-0.5 Investor B	105.048	Investor A	104.85
FNMA30	382,500	4.250	PURCHASE	90.0	00	PUD	CA	FULL DOC	706	90.0	Y		Y	-1 Investor B	104.173	Investor A	104
FNMA30	395,910	4.375	PURCHASE	90.0	00	PUD	CA	FULL DOC	737	90.0	Y		Y	-0.5 Investor B	105.13625	Investor A	104.96
FNMA30	398,000	4.375	CASHOUT	80.0	00	SFR	CA	FULL DOC	810	80.0	Y		N	-1.375 Investor B	105.01125	Investor A	105
FNMA30	518,400	4.500	REFINANCE	80.0	00	PUD	CA	FULL DOC	765	80.0	Y		N	-1.5 Investor B	104.45	Investor A	104.33
FNMA30	417,000	4.500	REFINANCE	42.4	NOO	PUD	WA	FULL DOC	819	42.4	Y		N	-2.125 Investor B	104.418763	Investor A	104.33
FNMA30	388,000	4.500	PURCHASE	80.0	00	2 UNITS	WA	FULL DOC	762	80.0	Y		N	-1.5 Investor B	104.918763	Investor A	104.625
FNMA30	417,000	4.625	PURCHASE	80.0	00	CONDO	CA	FULL DOC	783	80.0	Y		N	-1.25 Investor B	105.8605	Investor A	105.625
FNMA30	417,000	4.750	PURCHASE	95.0	00	SFR	CA	FULL DOC	640	95.0	Y		N	-2.75 Investor B	105.84	Investor A	105.5
FNMA30	339,150	4.750	PURCHASE	85.0	NOO	SFR	CA	FULL DOC	773	85.0	Y		Y	-4.375 Investor B	105.86	Investor A	105.625
GNMA30	254,000	3.500	REFINANCE	96.4	00	SFR	CA	STREAMLINE	668	96.4	Y		Y	-0.875 Investor B	103.685	Investor A	103.325
GNMA30	361,041	4.000	REFINANCE	73.2	00	SFR	CA	STREAMLINE	774	73.2	Y		Y	-0.125 Investor B	106.84125	Investor A	106.75
GNMA30	608,770	4.000	PURCHASE	96.5	00	SFR	CA	FULL DOC	642	96.5	Y		Y	-1.5 Investor B	105.46625	Investor A	105.4
GNMA30	245,217	4.000	CASHOUT	71.9	00	SFR	CA	FULL DOC	651	71.9	Y		Y	-0.5 Investor B	106.34125	Investor A	106.1
GNMA30	583,790	4.000	CASHOUT	84.4	00	SFR	CA	FULL DOC	711	84.4	Y		Y	-0.875 Investor A	105.59125	Investor C	105.25
GNMA30	402,573	4.500	PURCHASE	96.5	00	SFR	CA	FULL DOC	647	96.5	Y		Y	-0.5 Investor B	108.5	Investor C	107
GNMA30	540,038	4.500	PURCHASE	96.5	00	SFR	CA	FULL DOC	671	96.5	Y		Y	-1.5 Investor B	107.5	Investor C	107
GNMAI130	160,765	3.875	CASHOUT	37.6	00	SFR	CA	FULL DOC	668	37.6	Y		Y	-0.5 Investor A	105.8990313	Investor C	105.35
GNMAI130	234,671	3.875	PURCHASE	96.5	00	SFR	CA	FULL DOC	685	96.5	Y		Y	0 Investor A	106.2740313	Investor C	106.15
GNMAI130	410,256	3.875	REFINANCE	97.8	00	SFR	CA	FULL DOC	617	97.8	Y		Y	0 Investor A	106.1490313	Investor C	106.05
GNMAI130	234,945	3.875	PURCHASE	100.0	00	SFR	CA	FULL DOC	641	100.0	Y		N	-0.65 Investor A	106.2740313	Investor C	106.22
GNMAI130	424,297	3.875	REFINANCE	71.9	00	SFR	CA	STREAMLINE	665	71.9	Y		Y	-1.875 Investor A	105.8990313	Investor C	104.6
GNMAI130	390,449	3.875	REFINANCE	82.5	00	SFR	CA	STREAMLINE	679	82.5	Y		Y	-0.875 Investor A	106.8990313	Investor C	105.7
GNMAI130	279,837	4.125	PURCHASE	96.5	00	SFR	CA	FULL DOC	721	96.5	Y		Y	0.25 Investor A	107.4089413	Investor C	107
GNMAI130	345,267	4.125	PURCHASE	100.0	00	SFR	CA	FULL DOC	648	100.0	Y		N	-0.65 Investor A	107.1589413	Investor C	107
GNMAI130	613,679	4.125	PURCHASE	96.5	00	SFR	CA	FULL DOC	643	96.5	Y		Y	-1.5 Investor A	105.9089413	Investor C	105.5
GNMAI130	279,837	4.250	PURCHASE	96.5	00	SFR	CA	FULL DOC	653	96.5	Y		Y	-0.5 Investor A	107.33522	Investor C	107.115
GNMAI130	206,196	4.250	PURCHASE	96.5	00	SFR	CA	FULL DOC	642	96.5	Y		Y	-0.5 Investor A	107.33522	Investor C	107.115
GNMAI130	119,746	4.250	PURCHASE	85.6	00	SFR	CA	FULL DOC	733	96.5	Y		Y	0.25 Investor A	107.83522	Investor C	107.66
GNMAI130	610,253	4.250	REFINANCE	92.3	00	SFR	CA	STREAMLINE	801	92.3	Y		Y	-1.125 Investor A	106.71022	Investor C	106.625
GNMAI130	184,594	4.250	PURCHASE	96.5	00	SFR	CA	FULL DOC	683	96.5	Y		Y	0 Investor A	107.58522	Investor C	107
GNMAI130	302,421	4.250	PURCHASE	96.5	00	SFR	CA	FULL DOC	796	96.5	Y		Y	0.25 Investor A	107.83522	Investor C	107
GNMAI130	142,373	4.375	PURCHASE	96.5	00	SFR	CA	FULL DOC	705	99.5	Y		Y	0.125 Investor A	107.7626375	Investor C	107
GNMAI130	521,500	4.375	CASHOUT	100.0	00	SFR	CA	FULL DOC	675	100.0	Y		N	-1.95 Investor A	106.7626375	Investor C	106.5
GNMAI130	367,740	4.375	PURCHASE	100.0	00	SFR	CA	FULL DOC	669	100.0	Y		N	-0.65 Investor A	107.7626375	Investor C	107
GNMAI130	186558	4.375	PURCHASE	96.5	00	PUD	CA	FULL DOC	687	96.5	Y		Y	0 Investor A	107.7626375	Investor C	107
	14,098,521														106.0109		105.6804 (0.3304)
			AOT Price														
GNMA II 30	6,015,384	106.7576															
GNMA 30	2,995,429	106.4138															
FNMA 30	5,087,708	105.2169															
AOT Sale	14,098,521	106.1285															
Difference	\$ 16,587.58	0.1177															

The “at the time” qualification comes in because the pricing-based best-execution systems employed may not have received pricing from the investor or group of investors reviewed for many hours (many investors only change pricing periodically or when they need to, and the prices that are posted to automated systems do not require them to purchase loans at these posted prices — they are indications). Hence, much of what is used in these systems is old information and not reliable for execution purposes. In addition, alternative-sale executions are not evaluated and a total sale comparison not performed.

The proper method for best execution would be to gather all pricing simultaneously for all investors on both a loan-level basis and for pools of loans constructed to minimize certain LLPA features to avoid pricing adjustments like high loan balances. This also applies to bulk sales, where sometimes all loans are priced, or just the bulk package. In addition, if the firm in question can form stipulated pools, anticipated gains from the increased MBS pricing for these pools should be used in pricing, on a conservative basis. After gathering all of this information, a goal-programming based methodology should be employed to maximize the total sale for the day if it is determined to be a “good” day to sell. It is also important to check whether a best execution is done on the outlier loans: high or low coupon, 15yr, 20yr and so on, to make sure that the last 10% of loans also are being sold at maximum profitability.

Other considerations regarding best execution have to do with whether or not it is a “good day” to sell to investors, as their appetite for product varies every day, as shown by the spread between investor prices and the current coupon TBA MBS price, even after adjustment for the OAS value of servicing. If loans are sold over-the-counter to the agencies, they also vary in terms of their competitiveness on a daily basis. Only those securitizing their product avoid the basis risk between the value of their loans and the TBAs used to hedge them. This “good” *day* qualification can turn into *minutes* in a fast-moving market! The following graph illustrates this basis risk to the average originating firm that does not retain and securitize its loans:



TRADING

Does the firm conduct trading in mortgage-backed securities in the forward TBA market, hedging the mortgage pipeline during market hours? This requires traders to be at work or at least connected during those hours, which start at 5:15 AM on the west coast and end at 2:00 PM PST. This timeframe is out of sync with the rest of the organization on the west coast, but generally works since locks are given after-market hours and need to be covered as soon as the market opens.

- *Research and Analysis* is a general activity all traders should be performing and may include spread analysis between products and coupons, OAS yield-curve rich-cheap analysis, diffusion analysis, which investors have an axe on which products, which are paying up for stipulated pools and what the levels are for each, etc.
- *Dealer and Conduit Account Maintenance* refers not only to keeping records accurate, but also to making sure pool information is given and trades are tracked all done on a timely basis, as well as wires on settlement.
- *Executions* encompass how effectively the company trades and who makes the decision to trade, what to trade, how it will be done, where the trade will be done, why it will be done, and who it will be with. Things like counterparty risk and trade concentrations and capacity utilization should also be monitored to reduce risk. Also, someone outside of secondary marketing must insure that no kickbacks

or non-transparent fees are paid to outside parties for executed trades and that all trades and reporting must be clearly identified on position reports. A trader who just picks up the phone and calls the friendly broker-dealer he or she talks to every day without thinking and analyzing is not doing the job.

- *Trade Confirmation* happens after trades are complete from the counter party. It should be reviewed by someone outside of the trading group, e.g., someone in accounting.
- *Margin Call Management* can be a big deal for firms with limited amounts of capital compared to the amount of business they are doing. In such cases it is much better to proactively trade and manage the margin position, rather than be forced to turn over large sums of money that are held until settlement.
- *Trade Tracking and Reporting* is an important activity that also includes the double-checking by traders of the information entered into the secondary-marketing system for accuracy, and whether it was entered at all. This all needs to be completed on an ASAP basis so the next pipeline-risk-position report run in the hedge model includes the activity. Basically, a significant amount of work must be constantly performed in order to maintain an accurate picture of the hedged pipeline so when things change rapidly a manager can respond accordingly. Nothing is worse than trading on inaccurate information or having no information about the pipeline to be hedged.

LOAN ORIGINATION SUPPORT

The concepts in the section *Loan Origination Support* are often overlooked by secondary-marketing staffs; however, it can turn out to be the one area that determines the longevity of their career; to ignore it imperils your job security. The secondary-marketing manager and staff should make every effort to work effectively with the rest of their mortgage company's departments. Specifically, they need to make sure they are constantly communicating with underwriting, product development, marketing, production, accounting, and other areas to ensure that they lead the loan-origination effort when it comes to having what they need to sell out in the field, whether that means a new loan program, alternative lock period, investor, or long-term float-down lock. This also should include periodic presentations by secondary staff to loan officers about how things work on the secondary side, what happens to locked loans after they are taken, how loans are delivered to the secondary market, how loans are priced, etc. Not only will accurate market intelligence from the field's perspective be relayed, new ways of doing things for the company and customer will surface.

LOCK DESK MANAGEMENT

The section *Lock Desk Management* refers to the critical methods, tools, policies, and procedures used to manage the pricing, tracking, distribution, and requests that

come from the loan-origination staff and customers. This may include when pricing is accomplished, when pricing is changed, and how often pricing is updated. If your target margin is 75 basis points, having a policy that allows current pricing to linger after a market decrease of 25 basis points will impact your profitability.

Pricing & Rate Sheet Distribution

Pricing & Rate Sheet Distribution could be considered one of the most important aspects of the pipeline risk-management role. Pricing levels and products priced well, where they are intended to be sold at time of origination, and by what method, should all be carefully managed and executed by secondary.

For example, if a company used a best-efforts pricing source, and sold on a mandatory basis using a spread above the best-efforts price to get a targeted margin, this margin will often result in a realized spread that is either too high or too low, because they are not tied directly. Hence, when best-efforts spreads tighten in weak markets, (best-efforts investors improve their pricing), the resulting spread upon sale by the company will be lower. It is always better to price loans that are targeted to be sold in the secondary market on a mandatory basis, whether securitized or sold on an AOT basis, with the prices available for the intended execution. The primary reason is to achieve consistency of execution and measurement of secondary-marketing operating results. Basis risk occurs otherwise, and is a two-edged sword! We have seen plenty of firms price to a source they thought would be following the MBS TBA market, only to find out later that it didn't work out because the source was artificially improving their price to drive volume, only to back off that level when it came time to deliver loan product. Investor and execution basis risk is real; one should try to avoid it.

New Locked Loan Spread Tracking

New Locked Loan Spread Tracking's importance should be self-evident because without it, how would anyone ever know how well the secondary group performed, or how well a particular hedge model or service performed, or what should be expected from the profitability of originations? The secondary group must measure the exact expected profit for each loan originated at time of lock so the expected mark-to-market reflects the company's profit expectations and execution. Using the wrong barometer can leave secondary looking like they are super stars, when in fact, they may be falling significantly short in terms of margin preservation and management due to too high of an originated margin that is not visible to the company and management. Things like expected pickup from pooling loans in a manner that produces more profit should be incorporated into the margin expectations, i.e., pooling high-balance loans to avoid the LLPA hit is just one example. In addition, firms that retain servicing and do not have the same LLPAs that other investors charge should adjust their yardstick appropriately, so accurate originated margins can be obtained. This goes for expected gains from stipulated pools as well. Lastly, each product type and lock period should have expected hedge costs associated with the lock originated.

For example, a 15-day "Documents-Ready" retail FHA loan should have a significantly lower hedge cost compared to a 60 day "In Process" wholesale-originated high-balance conforming loan. In each case, the correct hedge cost should be applied when

calculating the originated margin. Every day new loans originated should be reviewed to determine whether the expected profit level is being achieved through the pricing and lock system New Lock Review/Audit.

Pricing Surveys

Usually, it is secondary marketing's responsibility to gather, or at least work with origination staff to gather *Pricing Surveys* used to monitor the competitive pressure in each significant market. The data collected would reveal the actual pricing levels in each significant market, and how the company's posted prices compare. Leaving this to outside firms or origination staffs can lead to many problems, and should be done by the secondary-marketing area.

Lock Policies & Procedures

Lock Policies & Procedures can have a significant impact on how well an organization runs, how profitable they will be, as well as how much business the company receives. These policies and procedures need to be compliant with regulatory requirements, but also must reflect secondary-market realities. For example, if a firm does not allow extensions on locks and simply cancels them after expiration, they would miss a significant amount of business. Likewise, if they charge too much for extensions, they might also lose business. The correct policy would have extension costs reflect the actual roll market, and give extensions to customers whose loan-processing timelines dictate that need. There are many examples in this area to avoid, such as giving renegotiations to all locked loans after a market rally. Mistakes such as this can be reviewed in the appendix to this chapter titled *Ways to Mess Up in Secondary Marketing*.

Pricing Requests and Exception Tracking and Reporting

Alternate Pricing Requests, Exception Pricing Requests, Extension Pricing Requests, Locked Loans and Exception Tracking and Reporting are all tied together, in as much as each firm needs to price, track, and execute them correctly to be in compliance and to capture the correct originated pricing spread. A loan that is extended by 30 days, and is charged nothing, does not maintain its original pricing spread; the originated spread should be reduced by the roll cost in the market plus a bid-asked spread, to be fair. Exceptions need to be tracked, as well as the purpose and reason associated with the exception, so compliance will have a reasonable explanation for giving one borrower a better deal than another borrower, as well as for margin-tracking purposes.

GAIN ON SALE PROFITABILITY & REPORTING

Gain on Sale Profitability & Reporting is usually done outside of the secondary marketing area, but should be coordinated with secondary from an expected income-recognition basis. For example, given the current rules for recognizing income from sales versus hedge accounting, vast swings in recognized gain-on-sale could occur when loan sales are booked relative to when pair-offs are booked into the general ledger. For instance, when loans that are sold into the secondary market, even when hedged with the correct coverage in terms of price change and delivery month, a situation could occur where

loan purchases are delayed by the investor and pair-offs are booked. This could result in either too high or too low an income level for the month in question, depending on the market move during the period. This can occur even with month-over-month booking of changes in value in the position components. If the market improved during this scenario, too much loss would be booked with not enough income, since the loans did not settle, but the trades with losses did. Conversely, if the market had sold off during the period, too much income would have been booked, and loan sale losses will show up in subsequent months. The primary reason this area is noted is because loan sales and pair-offs should be tracked by secondary marketing on a designation basis, so actual expected profit can be tracked, not just booked profit levels. In addition, it is usually very helpful for secondary to show the expected profit from loan sales, pair-offs, or pooling so that purchase advices and account reconciliations by accounting can be done efficiently. In addition, without pairing these items up at time of designation, *Hedge Cost Analysis & Tracking* becomes difficult if not impossible.

Originated and Booked Margin

Weighted-Average Originated Margin versus expected *Booked Margin Reconciliation* at time of designation should be reviewed monthly and examined quarterly to get an idea of how well secondary is performing. As mentioned above, the correct after-hedge-cost originated margin should be captured for every loan in addition to the actual expected profit for each loan, after pair-offs and trading expenses are captured to arrive at the actual variance. Too much positive variance means either the originated margin was higher than what was tracked, or the company took on additional risk during the period. A negative variance could mean a low originated margin versus expectations, or an inefficient hedge system, or both.

Shipping and Settlement Management

Shipping and Settlement Management refers to the fact that delays in operations getting loans to investors will cost the organization money due to late-payment penalties or rolls to later months. Shipping should be working on stacking order and potential pool delivery well before loans are sold in whatever form of execution and sent for settlement, as loans are usually sold in a similar fashion one month to the next, given a firm's execution and investors. Keeping information flowing between departments is necessary, and shipping should be well informed of possible activity before it becomes a month-end crisis.

Designation and Securitization P&L

The *Designation and Securitization P&L*, as shown in the sample below, provides secondary with a tool needed to prepare accounting and the CEO with expected profit margins in the future, and for tracking YTD performance:

Sample
Designation Gain on Sale Estimate
 03/21/12

PROGRAM GROUP	MONTH TO DATE				YEAR TO DATE			
	CASH	EXCESS	SRP	TOTAL	DESIGS	MKT%	SRP%	TOT%
FHA/VA 30YR	192,851	0	106,541	299,392	10,010,056	1.93%	1.06%	2.99%
FHA/VA 15YR	4,562	0	424	4,985	251,389	1.81%	0.17%	1.98%
FHA/VA 1YR CMT	0	0	0	0	0	0.00%	0.00%	0.00%
CONV 30YR	186,284	0	(7,177)	179,107	14,184,250	1.31%	-0.05%	1.26%
CONV 15YR	(539)	0	8,448	7,909	1,031,000	-0.05%	0.82%	0.77%
CONV 7YR	0	0	0	0	0	0.00%	0.00%	0.00%
CONV 5YR	0	0	0	0	0	0.00%	0.00%	0.00%
CONV ARM	0	0	0	0	0	0.00%	0.00%	0.00%
JUMBO 30YR	0	0	0	0	0	0.00%	0.00%	0.00%
JUMBO 15YR	0	0	0	0	0	0.00%	0.00%	0.00%
JUMBO 5 YR	0	0	0	0	0	0.00%	0.00%	0.00%
JUMBO ARM	0	0	0	0	0	0.00%	0.00%	0.00%
OTHER	0	0	0	0	0	0.00%	0.00%	0.00%
SUBTOTAL	383,157	0	108,236	491,393	25,476,695	1.50%	0.42%	1.93%
ADJUSTMENTS:								
OPTION FEES								(89,688)
MARK TO MKT CBT OPTIONS								0
COMMITMENT FEES								0
PAIROFFS			(43,789)					(949,618)
CURRENT DISCREPANCIES			0					0
SETTLEMENT DISCREPANCIES			0					(48,928)
MISC TRADING FEES			0					0
OTHER BUY UP/DOWN FEES			0					0
PHLMC BUYUP/DOWN FEES			0					0
FNMA/PHLMC NON OWNER OCCUPIED FEES			0					0
INTEREST INCOME CREDIT			0					0
OTHER			0					0
SUBTOTAL ADJUSTMENTS			(43,789)					(1,088,234)
TOTAL PROFIT (LOSS)				447,604	25,476,695	1.33%	0.42%	1.75%
								6,967,071
								450,710,266
								0.88%
								0.67%
								1.55%

INVESTOR RELATIONS AND MISCELLANEOUS TOPICS

The last two sections in the Report Card, *Investor Relations* and *Miscellaneous*, contain very important but often overlooked elements of the secondary-marketing responsibility area. How well a firm negotiates with investors, tracks down missing documentation, resolves problem loans — i.e., avoids or fixes loan defects — can often lead to long-term success or failure. In addition, *Warehouse Capacity, Management, and Reviews* should be performed in order to have enough capacity when growing or, when adverse markets appear, avoiding excess capacity, which can lead to inferior service or insufficient attention from line partners. Good *Secondary Marketing Systems Administration* and *Policies and Procedures* are necessary, and the more quality documentation, the better.

In grading each area of responsibility, it is important to remember, “A”-level performance in the past will not necessarily suffice in the future. Mortgage banking is a dynamic business that demands professionals to keep their game up to date. In addition, grading should be done on a curve to account for the variation of responsibilities for each individual; not all areas listed here necessarily apply to one person.

CONCLUDING THOUGHTS

As mentioned in the introduction, this chapter has discussed pipeline interest-rate risk management from a measurement perspective, covering a wide and detailed subject area. By no means was this an all-encompassing review of the subject matter; however, we have discussed many topics and pointed out many issues that confront the pipeline manager. Many of the concepts discussed require in-depth review on exactly how the strategy needs to be implemented, as tactics in many instances play a vital role in the overall scheme.

Another important concept to recognize is that if you are in the mortgage business, you are in the options business, as the borrowers who receive a lock have the *option* to close. Even though these options are not perfectly exercised by your borrowers, enough usually do on average, and subject your pipeline to fallout volatility that can only be effectively hedged in volatile markets by the correct amount, type, and strike-priced options to offset that risk. I like to refer to pipeline interest-rate risk management as comparable to a bow-hunting excursion — it is often preceded by long periods of constant work (target practice, tuning, scouting, preparation for the trip, and searching for a target). The outcome depends on not just how lucky you are, but how well prepared you are.

APPENDIX ONE: SYNTHETIC PUTS

The use of options as a tool to hedge a mortgage pipeline is nothing new. Options can be an effective tool to reduce risks associated with residential mortgage loan fallout or renegotiations due to market movements. They can also be effective for extended-term locks and float-down locks. There are two main choices for the type of option instrument to use: options on Mortgage Backed Securities (MBS options) and options on Treasury securities, either Futures or Cash. For this review, we will only consider the 10-year Treasury futures contract options; however, MBS options are preferred if available and fairly priced.

Option contracts come in the form of puts and calls. As with any transaction, there is a buyer and a seller. This holds true for option contracts as well; the pipeline manager or hedger could be a buyer (option holder) of puts or calls, or they could be a seller (writer) of them, but this is never recommended because it opens the door to an unlimited amount of market movement — something no mortgage banker should take on.

An Option can be defined as a financial derivative that represents a contract sold by one party (option writer) to another party (option holder). By the way, MBS TBA sales are also derivative instruments! The contract offers the buyer the right, but not the obligation, to buy (call) or sell (put) a security or other financial asset at an agreed-upon price (the strike price) during a certain period of time or on a specific date (exercise date). The price paid for the option by the holder is called the option “premium”.

Call options give the option to buy at certain price, so the buyer would want the price of the underlying security to go up in order to receive a return on the premium paid. Put options give the option to sell at a certain price, so the buyer would want the price of the underlying security to go down in order to receive a return on the premium paid.

For utilizing puts and calls to hedge a mortgage pipeline, the hedger should want to limit exposure to the company. This is best achieved by being a buyer of the contracts rather than a seller (writer) of the contracts. One might think of it like paying a one-time premium for an insurance policy. A premium is paid to protect against a risk that may occur. If risk occurs and there is reasonable price movement, the contract can be acted upon to recover the loss. If risk of loss never comes to pass, then the hedger

is out the premium only. If one is the writer of the option contract, then one has the exposure of unlimited market movement, and is responsible for paying for the loss that may occur.

A locked loan in a mortgage company pipeline represents a form of a free put contract to the borrower, or, stated another way, the borrower has the right to take the loan, but not the obligation. Because the borrower does not have to close the loan with the lender, and there is usually a relatively low cost to apply for a loan, the lock agreement leaves the mortgage company at risk to market price changes associated with a TBA MBS hedge. While fallout can be statistically measured based on past performance, the cost of buying after a rally and selling after a downturn leaves many chasing their tails or being “whipsawed” by the market. This has significant costs in a volatile market. Put contracts and synthetic put contracts are utilized to absorb the changes in a firm’s pipeline position from fallout associated with these market movements. For example, when the market sells off, a put contract increases in value and provides more coverage, allowing the hedger to not have to sell after a downturn, and decreases in value and coverage amount when the market rallies.

A synthetic put can be defined as the sale of a TBA MBS in conjunction with the purchase of a call contract on the like instrument, either the like TBA MBS or the 10-year Treasury futures contract. This acts the same as a put contract given a constant spread relationship, correct amount to sell, and accurate hedge ratios. A put contract protects or gains value when the value of the underlying loses value. In the case of a synthetic put, the financial instrument (MBS) is sold short and a call contract is purchased on the financial instrument. If the market value drops, the underlying financial instrument will gain in value and the call option would expire worthless. In the event of a market rally, the call will pay for the losses on the additional MBS short and provide a buffer against having to pair off additional pipeline coverage. In the case of the put contract, you are long loans and short MBS and own a put contract. If the market sells off, the MBS will gain in value by an amount relatively the same as the loans change in value sans servicing value, but the fallout will decline on the loans causing a higher percentage of loans to close. The change in fallout on those loans results in a larger long position which is exposed to poorer prices. The correct amount of put contracts, whether synthetic or actual puts, will make up that difference created by the fallout change.

A secondary-marketing system must calculate the changes that occur due to market movements and provide the recommendations based on those movements for the amount of optional coverage to add to protect against the potential reductions in the mark-to-market value of a given pipeline. This hedge position optimization is provided to show how much option coverage would be required to effectively neutralize potential mark-to-market value changes associated with market movement and the changes in fallout.

MBS options are very good instruments to use, because they are derived from the securities that are used to price mortgages and to hedge the mortgage pipeline. Much

like other markets, there are good times to buy and sell and not so good times to buy and sell. In the case of option contracts, the cost of the option premium is higher when volatility is elevated, and the cost recedes when volatility is low. In addition, the hedger would want to pay attention to the spread between the current coupon yield of the underlying MBS compared to the yield of the 10-year Treasury contract on an OAS basis. This is important to allow the hedger to derive the most value possible out of the option contracts purchased. History tells us that the yield spread between these two instruments are not constant, but that they do correlate, with mean reversion being a powerful tool. When the spread is wide between the two and has stopped getting wider, this may mean that the price of the MBS has lagged the price of the 10-year Treasury OAS adjusted, which is what happened in early 2008, when spreads reached historic levels. That trend tends to reverse itself, and the spread will narrow, all things being equal, through mean reversion. By recognizing that this occurs and by tracking the OAS spread, the hedger can get a good view and consequently a good understanding whether to be a buyer of Treasury put contracts versus a buyer of call contracts with TBA MBS sales (synthetic puts). However, if you do not want to take on the basis risk or potential spread movement, one should use an equal coverage value amount of Treasury puts and synthetic puts — dollar, OAS hedge ratio, and strike-price adjusted.

So what are some examples of causes of spreads widening or narrowing?

Widening:

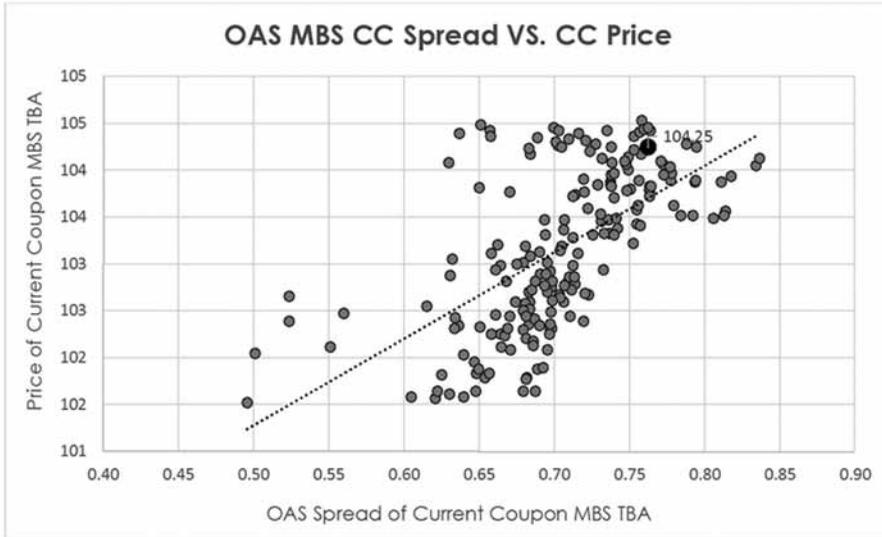
- Investors response to the housing crises
- Supply and demand imbalances
- Large sales of MBS product by loans originators
- The end of an investors large purchases of MBS Product
- Political and economic turmoil sends investors to safe havens

Tightening:

- Fear of war dissipates or political conflicts go away
- Lack of price volatility in financial markets
- Fear of economic collapse dissipates or economies stabilize.
- Supply and demand imbalances
- Large purchases of 10-year Treasury securities by investors

While these events do not seem like they may occur frequently, the fear or speculation that something may happen *does* tend to happen more frequently, causing spreads to widen and narrow in short periods of time. During the 2008 housing crisis, investors shunned MBS securities, as demonstrated by the spread widening that occurred.

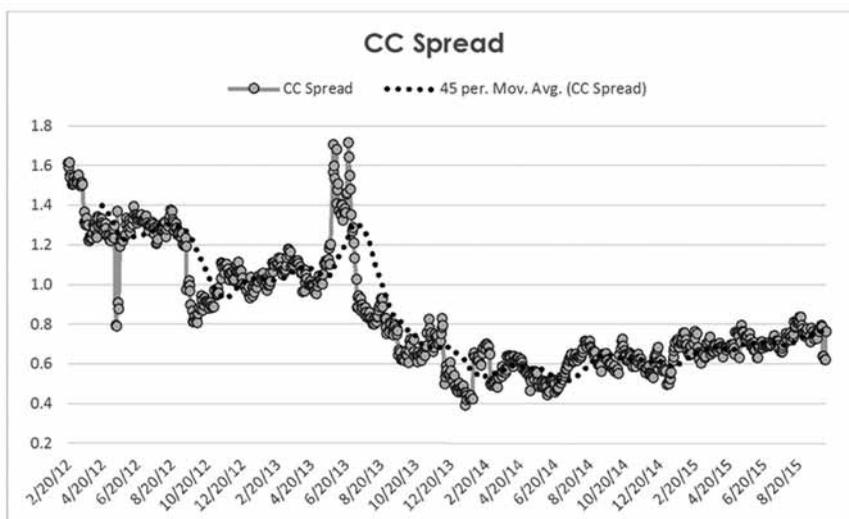
For example, below is the spread between the current-coupon Fannie Mae MBS security OAS yield and the 10-year Treasury contract OAS Yield with the corresponding MBS price level in an XY graph presentation:



One can see that the spread is relatively wide at above 70 basis points in yield and relatively low below that level for the period depicted in the graph. Also of interest is to know where the price level of the MBS security is at any given point in time relative to the OAS spread. If one focuses on the black dot as the most recent price, the regression line indicates that given a price level of 104.25, the OAS spread is relatively low and would otherwise be over 80 BPS given the price level. So, at current market prices, the OAS spread is slightly on the tight side. This indicates that one might expect the spread to widen, or prices of the FNMsA30 3.5 to reduce relative to the price of the 10-year Treasury futures contract, OAS hedge-ratio adjusted.

Let's assume low volatility for the purposes of the following example, thereby offering us lower-priced option premiums. In the market represented above, where spreads are tighter than would be expected given the current price level and history, one would want to buy synthetic puts since we expect spreads to widen, thereby gaining from Treasury calls gaining in value faster than expected, given no change in MBS price level. Had the spread been wide, we would then be more motivated to buy Treasury put contracts, as we would expect the price yield spread to tighten, e.g., MBS stays flat and US 10-year prices decline. This balancing act of managing the basis risk when purchasing Treasury puts and/or creating synthetic puts requires an active-management philosophy and the ability to measure risk and react relatively quickly. In order to avoid this basis risk, one should actively seek to balance the amount of Treasury-put and synthetic-put coverage to minimize overall risk or stick to the preferred options; options on TBA MBS securities. However, the risk from the synthetic-put options strategy is not so high (compared to being the writer of a call or put) that one should not consider the use of synthetic puts when combined with Treasury puts; and, if managed correctly, the cost of hedging will go down during volatile markets. If markets remain flat there would have been no need for any options; but looking back provides 20/20 vision.

One of the downsides to MBS options in today’s market is that there are very few dealers that make a market in these instruments relative to historical norms. This tends to cause illiquidity, resulting in higher premiums or the inability to trade the MBS option contracts at all, especially for smaller firms. In addition, they are traded in \$1,000,000 trade amounts, which can create less than optimal option positions for smaller firms. This is where 10-year Treasury options come in. Because there is a correlation between the two instruments, one can use the 10-year Treasury contract just as one would an MBS option to protect the pipeline. The advantages of 10-year Treasury options are that they are liquid, priced competitively, can be paired off at any time, and they are traded in \$100,000 increments. The risk of buying 10-year Treasury options can be described by the graph below that indicates the OAS spread movement over a longer period of time that requires accurate and active management:



In the case of utilizing 10-year Treasury option contracts, if spreads are wide for the period reviewed, one would expect the spread to narrow or the price of the 10-year Treasury to over-perform relative to the price of the current-coupon MBS when rates rise, or MBS securities to outperform relative to 10-year Treasuries when rates fall. The movement of spread can be from either positive or negative movements of price or rate levels.

Perceived Market Condition:

Wide Spread	=>	Buy 10-year treasury futures puts options
Narrow Spread	=>	Buy synthetic puts (10-yr calls plus MBS TBA sales)
Basis Neutral	=>	Buy equal amounts of each (OAS HR, Strike, and \$ adjusted)

By utilizing the strategy described above, you can limit the basis risk associated with Synthetic 10-year Treasury Options hedge. This will optimize their use in effectively neutralizing fallout risk due to market movement. Ultimately, the use of these contracts will help in stabilizing profit margins that the company has priced to make on the loans they hedge, costs from renegotiations, and float down locks. By not using options, one is expecting the market to be flat and/or the fallout volatility in the pipeline to be flat. In either case, no options would be required, to avoid excessive hedge costs.

To further reduce the effects of basis risk, one should keep the amount of OAS hedge-ratio adjusted coverage provided by both Treasury Puts and Synthetic Puts (Treasury Call purchases with MBS TBA forward sales) equal, thereby keeping the effects of spread widening or tightening on either side of the equation equal.

APPENDIX TWO: WAYS TO MESS UP IN SECONDARY MARKETING:

“Great companies are similar in a lot of ways; poor companies are unique in their own way.”

The difference between a highly profitable and a mediocre mortgage lender often comes down to the methods and tools used to minimize risk and decrease liability. There are many ways to run your secondary-marketing operation, and knowing the difference between the most and least effective is a key differentiator.

Operations

1. Set up secondary marketing as a profit center.
2. Compensate the secondary-marketing manager solely from gain-on-sale profitability.
3. Pressure secondary-marketing manager to make a certain amount of profit above the priced-in gain on sale target.
4. Don't measure the effectiveness of the secondary marketing department.
5. Don't have a clear policy for managing pipeline interest-rate risk — let manager “bet” the market.
6. Make secondary-marketing staff work beyond their capacity or area of expertise.
7. Don't clearly state your lock-extension policy in your policy manual.
8. Allow originators the ability to broker locked-in loans for better pricing.
9. Allow production staff the ability to lock loans directly with investors.
10. Allow the pipeline risk-position manager to sleep in — the market is always improving.
11. Let the shipping manager decide when loans are to be delivered to an investor.
12. Let the loan-origination manager decide what pricing levels should be.
13. Allow loan officers to back-date locks.
14. Allow loan officers to manage loan data.
15. Don't cross-train secondary marketing staff — the manager of secondary has been here for xx years.
16. Allow loans that have been “In Process” to lock with the previous days pricing after the economic data for the day has been released.
17. Hide trading, pricing, delivery, and other mistakes so nobody will notice.
18. Don't fully commit to changing the way you do business when moving from a best-

- efforts execution strategy to a hedged mandatory-delivery strategy.
19. Outsource the lock desk, pricing, trading, and pipeline risk-management functions of secondary marketing without oversight and/or management.
 20. Don't calculate what each channel of business, branch, and loan officer brings to the table from a total-contribution analysis perspective.
 21. Don't track P&L expectations from loan sales, because accounting will always get the number right eventually.

Locks

22. Extend locks well beyond their lock periods — take too much time to close loans.
23. Leave locked loans that don't move through the normal processing stages to stagnate; i.e., leave them in the risk position until they expire.
24. Let Loans locked in a "No Application" status to be in the pipeline for the entire lock period.
25. Allow funding to close loans on locks that have expired or don't match what has been locked.
26. Don't check the accuracy of your pricing engine lock system, because you don't expect things to change once programmed.
27. Delete locks that don't close in your loan-tracking system, so fallout numbers are incorrect.
28. Commit locked loans to mandatory trades in excess of the amount expected to close; you can easily substitute fallout from new production.
29. Don't review the profit margins on newly locked loans to verify pricing and potential delivery issues.
30. Hedge long-term locks the same way you would short-term locks.
31. Hedge float-down locks and builder commitments the same, or the same as long term locks.
32. Provide borrowers with long-term locks without knowing what the closing percentages will be in the event rates drop.
33. Allow loans that have no chance of showing up with a 1003 to be locked.

Investors

34. Close and sell loans to investors that do not meet with investor requirements and expectations.
35. Refuse to negotiate with investors on problem loans, or just accept what an investor states in their buyback request.
36. Don't negotiate pricing with investors; they always give you their best price.
37. Expect investors to renegotiate and provide better pricing when rates fall.
38. Expect investors to extend locks without a cost when it takes longer than expected to close a loan.
39. Let investor-suspended loans linger.
40. Don't allow enough time for the warehouse bank to forward note to investor.
41. Ignore reasons a new investor's loans get suspended.
42. Only sell loans to the best-priced investor.
43. Don't follow-up with your investor's request on post-closing docs.
44. Don't keep a trade blotter to track trades with broker-dealers and investors.

45. Don't reconcile purchase advices; investor's never make a mistake.
46. Only use one investor for each product.
47. Expect investors to rationally price every rate and delivery period available with the assumption one spot fits all.

Pipeline

48. Don't use options when a pipeline source or renegotiation policy dictates their use is necessary.
49. Don't keep pipeline data clean – let users abuse the tracking system.
50. Hire the wrong firm or model to manage your pipeline risk position.
51. Let loans floating in the pipeline lock in with prior day pricing after the market has opened the next day.
52. Don't back up your loan pipeline or secondary marketing data.
53. Expect closing-rate characteristics of a pipeline will never change.
54. Don't reconcile pipeline risk-positions between reports and/or days.
55. Hedge your pipeline with the 10-year Treasury futures contract or the 10-year swap.
56. Assume that you can always add more trading capacity if and when your pipeline coverage needs or pipeline grows.

Pricing

57. Price loans on a best-execution basis to deliveries that are not available when loans close.
58. Let borrowers change loan programs at will without regard to pricing or execution.
59. Ignore loan changes that impact pricing changes, especially ones that have disparate impacts to LLP's.
60. Price loans on a mandatory basis and deliver them on a best-efforts basis.
61. Switch loan-processing or pricing-engine systems without testing the impact to secondary marketing data files and positions.
62. Don't update pricing when the market improves or sells off.
63. When losing money on the sale of loans into the secondary market, improve pricing so you can make it up with volume.
64. Rely on pricing surveys to set your rate sheet pricing; competitors always post accurate pricing for you.
65. Price loans using your best execution and expect the same profitability level when loans must be sold to a different investor due to documentation or underwriting criteria.
66. Allow loans to renegotiate to current market at will without pricing and hedging them with the use of options.
67. Don't centralize your pricing, lock, and trading desks.

Trades

68. Don't independently verify and confirm trades done in secondary marketing.
69. Don't confirm the details of trades with dealers; neither party ever makes a mistake.
70. Allow for a disproportionate amount of trades to be concentrated with one dealer or investor because they are too big to fail.
71. Forget to pair off trades after selling inventory late in the day.

72. Refuse to post margin on a trading account; there are plenty of dealers you can trade with.
73. Don't reconcile your trading accounts for mark to market accuracy, trading capacity, or settlement details.

Hedging/Forward Builder Commitments

74. Sell builders aggressively priced forward commitments without the ability to securitize the product.
75. Sell builders forward commitments expecting less than the dollar amount sold to be delivered.
76. Price all forward builder commitments the same based on market conditions and the term of the deal.

Market activities

77. Grow company originations beyond the capability to process, fund and hedge the production.
78. Cross-hedge risk positions without the need to do so, e.g., sell FNMA 15 yr. 3.5's to hedge GNMA 30 yr. 3.0's.
79. Go long or short within product types or delivery months without the need to do so.
80. Assume you won't get more than 10% of your loans in as High Balance.
81. Always rely solely on your market-data service provider to give you an accurate picture of the current market and its movements.
82. Assume that if you sell loans on a best efforts basis your risk is fully transferred to the investor.

Miscellaneous

83. Create duplicate loans in your loan tracking system without regard to the impact to your fallout calculations.
84. Rely on just one warehouse lender.
85. Jump on the bandwagon and create a loan program for everything that could possibly be available.
86. Don't explore alternative sale executions, because an AOT to investor "XX" has always been your best execution.
87. When selling a servicing portfolio, expect that its value will be same a year from now.
88. Create new loan programs before production, processing, underwriting, compliance; IT, funding, and shipping are ready. "Ships are best built after setting sail..."
89. Bet which way spreads between mortgage coupons/products will move; as long as you are flat overall nobody will notice.
90. Don't audit note inventory to loans sold to the Agencies.
91. Don't pay attention to cash flow of loans sold versus pair-offs because your company has plenty of cash to maintain margin accounts.
92. Use an MBS prepayment model designed and tuned for a long-term holding period to set hedge ratios on a 45-60 day pipeline.
93. Assume that your Agency guarantee fees will not change.
94. Count extensions as fallout when calculating your pullthrough percentages.

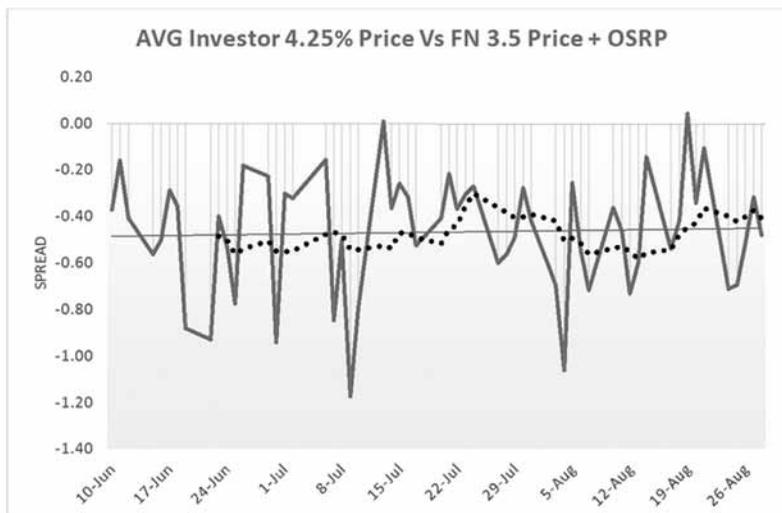
95. Assume that loans still in processing stages of “No Application”, “In Process,” or “Submitted” will close at the same rate after exceeding your company’s normal time line in that status, but before expiration of the lock.
96. Assume all wholesale brokers are the same from all perspectives.
97. Assume all correspondents are the same from all perspectives.
98. Assume all branches and loan officers are the same from all perspectives.
99. Don’t track your margin requirements on TBA dealer accounts.
100. When hedging, assume the probability of each shock increment is equal when constructing your hedge position.

While we have listed above at least 100 ways to “Mess up in Secondary Marketing,” we are sure there are many more unlisted. The purpose of the list is to give secondary-marketing professionals a guideline for reference. In addition, for every one way to mess up, there are probably a hundred more things to do, correctly, in order to prosper.

APPENDIX THREE: INVESTOR BASIS RISK

Many people in our industry fail to recognize one very important element when managing pipeline interest-rate risk on a daily basis: *investor basis risk*. Most who don’t know they have a problem will say they do not have any basis risk, since they use MBS TBA trades to hedge their pipeline (hedge ratio of choice adjusted); and, that may be true if they are able to securitize the pipeline into MBS securities and retain servicing. However, if they are like most mortgage bankers, then at least some if not all of the pipeline is subject to the basis risk between the daily price changes of the mortgage originated as priced by the targeted investor’s pricing and the TBA MBS security used to hedge. For example, regardless of whether loans are sold through loan-by-loan individual sales, bulk, AOT, co-issue, and so on, all of the loans are being priced by investors with their own individual appetites on a given day. It is not mandatory that they price according to the movement of the MBS market — they simply price according to what they want to make on a daily basis given the amount of business and backlog they have. They may consider competitive pressures and the market, but they definitely are not tied to either market movements or competitive pricing in the short run.

The graph below shows the average spread between the pricing available from eight different investors, tracked daily through various executions available, and the current coupon FNMA 30-year-fixed security price plus effective OAS servicing value. Even when the OAS value of servicing and its changes are removed from the equation, one can clearly see that some days it just does not pay to sell, and some days everything should be sold. When individual investors are tracked on this basis, you can clearly get an idea of who wants business, who does not, and how sensitive they are to market movements.



ABOUT THE AUTHOR

Dean Brown is the founder and CEO of Mortgage Capital Management. Since 1994, MCM has effectively helped mortgage bankers maximize profitability, decrease earnings volatility and powerfully manage their risks. Dean is one of the longest-running risk-management providers in the industry. Since 1984, he has held positions including Senior Vice President of Secondary Marketing for First Interstate Bank, Vice President of Secondary Marketing at The Hammond Company, and Assistant Vice President of Asset and Liability Management with Security Pacific Bank. Dean's extensive knowledge of the industry resulted in him personally conceptualizing MCM's unique offerings of pipeline and interest-rate risk management services and tools. He is an active member of the Mortgage Bankers Association. Dean has a Bachelor of Arts degree in Economics/Computer Science from Claremont McKenna College and a Master's in Business Administration in Finance from the University of San Diego. Dean also has held his California real estate broker's license since 1991.