



Mortgage-Related Pricing Methodologies

Best practices for valuing loans and mortgage backed securities in the current market

Measuring other-than-temporary impairment of certain debt instruments

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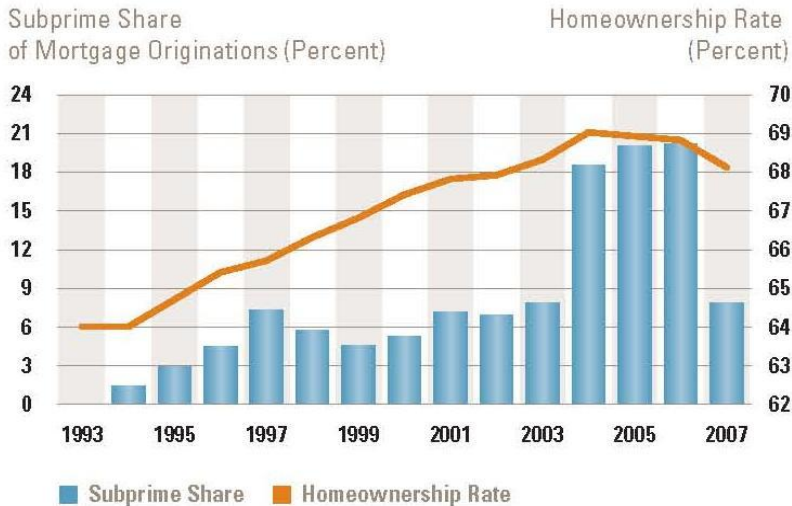
- Current State of the Valuation Environment
- Understanding Past Mistakes
- Developing a Valuation Framework
- Establishing a price
- Measuring other-than-temporary impairment of certain debt instruments

Markets dislocated,
Wide bid-ask spreads emerged,
Resulting in frequent pricing disagreements,
Which prevented organizations from being
able to value positions timely,
Creating collateral disputes,
Leading to fear of financial collapse and
collateral calls,
Leading to financial collapse.

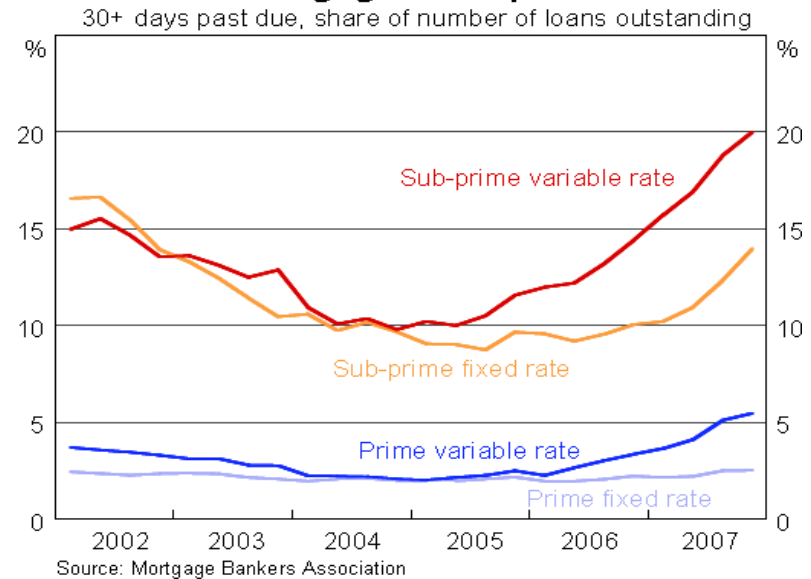
Self Fulfilling Prophecy – driven by fear

With a lack of performance history, internal credit models became less effective as risk-mitigation tools and compensating processes and controls were insufficient to compete with conflicting demand for earnings and market share.

The National Homeownership Rate Peaked Before Subprime Lending Took Off



US Mortgage Delinquencies



- Valuation is a challenge due to the complexities of the accounting rules and the nuances imposed by FAS 157, but also because the subject matter expertise needed to value a broad range of products.
- Valuation errors can lead to restatements (and lawsuits). The accountants will be blamed for the restatement, not the operating units who provided the numbers.
- External auditors, who typically have less valuation data than the company, need to get comfortable. The accounts must provide a comprehensive valuation package to the auditors.
- Best practices including documenting the rationale, the approach, the assumptions, and capturing source documentation is *absolutely* critical and will minimize second guessing after the fact.

As long as the market remains in turmoil, finance professionals will be challenged to produce valuation data for financial reports

- Basic elements for predicting credit loss may not change
- However, the correlation between assumptions and the relative weight given to each will certainly change.
- Factors at the forefront of credit analytics are:
 - Over-reliance on FICO;
 - Debt-to-Income (under-rated);
 - LTV and CLTV (piggybacks);
 - Investor status (speculator loans);
 - Documentation standards;
 - House price appreciation;
 - Delinquency transition; and
 - Re-evaluation of our “worse-case” scenarios.

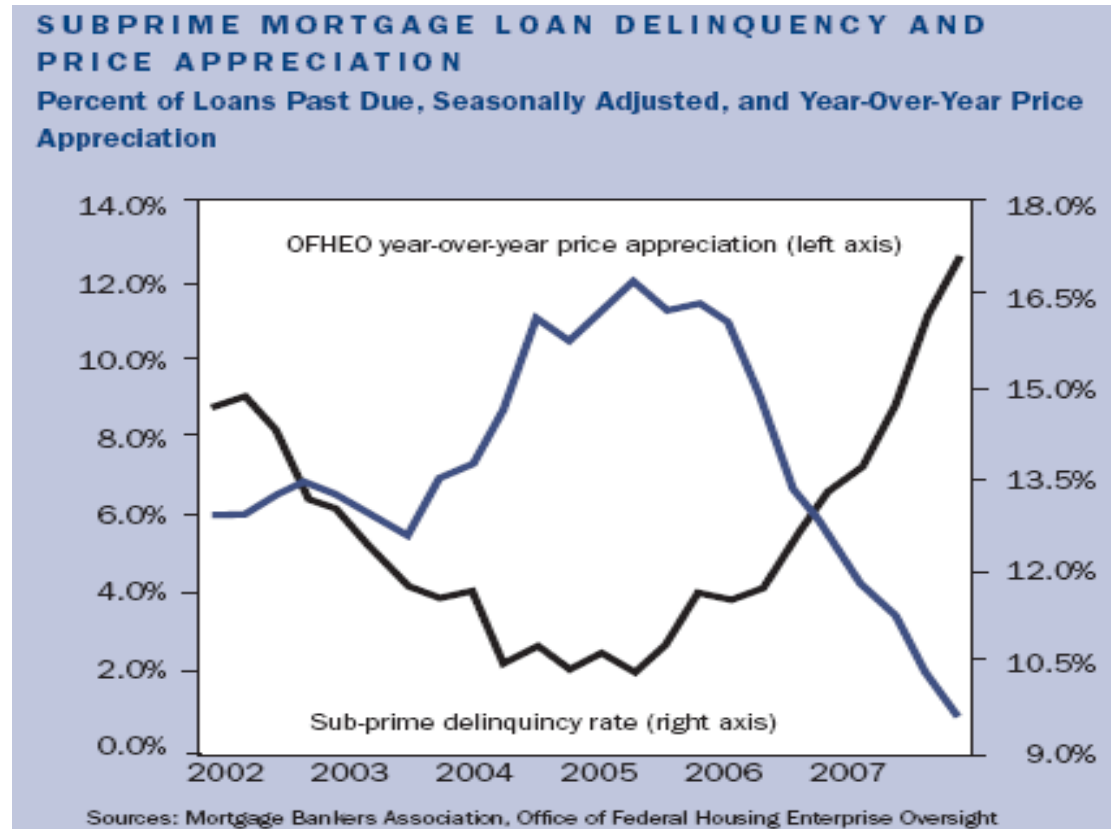
- Data in Table below suggests that a large percentage (33%) of borrowers were given loans with little or no down payment and more than half of such loans were further layered with stated documentation.
- Layered risk was thought to be compensated by higher FICO scores, yet the highest FICO (655) underperformed every other category.

Segmenting 2006 Subprime Originations

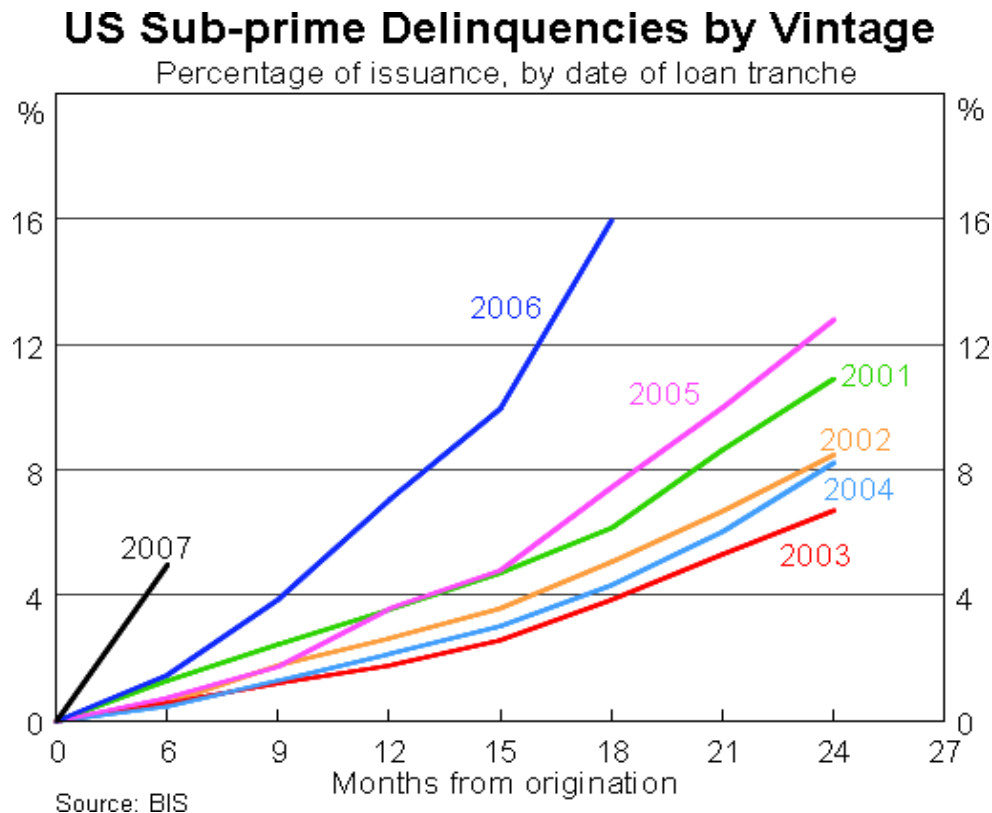
Comb. Loan-to-Value Ratio	Loan Purpose	Balance (%)	Avg. FICO	Avg. CLTV	% Stated Doc.	%60+ DQ. @ WALA 12
CLTV > 90	Purchase	33%	655	99	52%	16.6
CLTV <= 90	Purchase	11%	638	83	54%	13.5
CLTV > 90	Refinance	11%	643	97	37%	13.2
CLTV <= 90	Refinance	45%	606	77	38%	9.3

Source: LPS

- Underestimate of the covariance of home price trends across regions and geographic diversity would mitigate risk.
- Stress tests were not adequate where “worse case” scenarios held HPA flat and down turns were rarely modeled.



- Improving surveillance – a process that measures performance relative to expectations – is a key focus of every credit investor in the country.
- Tighter feedback loop for untested products and risk layering critical.



In developing a valuation framework, the following reports and committee recommendation should be considered:

- Group of Thirty recommendations
- Federal Reserve Trading & Capital Markets Examination Manual
- Comptroller of the Currency, Risk Management of Financial Derivatives
- Bank for International Settlements – Basel committee on Banking Supervision
- Recent Reports (and probably more to come!)
 - Committee of European Banking Supervisors – “Report on issues regarding the valuation of complex and illiquid financial instruments”. *June 18, 2008*
 - Committee of European Securities Regulators – “Fair Value measurement and related disclosures of financial instruments in illiquid markets. *July 2008*
 - Final Report of the Advisory Committee on Improvements to Financial Reporting to the US SEC. *Aug 1, 2008*
 - Containing Systemic Risk: The road to reform - The Report of the CRMPG III (Counterparty Risk Management Policy Group III). *August 6, 2008*
 - **Bank for International Settlements - “Supervisory guidance for assessing bank’s financial instrument fair value practice” *November 2008***

While there are emerging recommendation papers, the industry is clamoring for clear actionable guidance from the policy boards and regulators

- Ultimate responsibility for the determination of the fair value included in the financial statements resides with the CFO.
- Sufficient segregation of duties should exist between the front/middle office and function responsible for valuation
- Valuation and verification methodologies, with emphasis on judgments and assumptions should be vetted with Auditors, prior to, or as near as possible after, implementation.
- A senior management group should have responsibility for the oversight of control and valuation policies and procedures. This group should report the results of its work directly to the board of directors or the audit committee
- Current environment demands independent analysis and review to validate internal analysis and assess risks not captured in internal processes. Independent valuation auditors must be qualified enough to stand their ground with traders and portfolio managers
- Any valuation approach must be **consistent** and **reasonable**

Transparency into judgments and assumptions, buttressed by solid controls, all independently verified are critical to the accuracy of the financial statements!

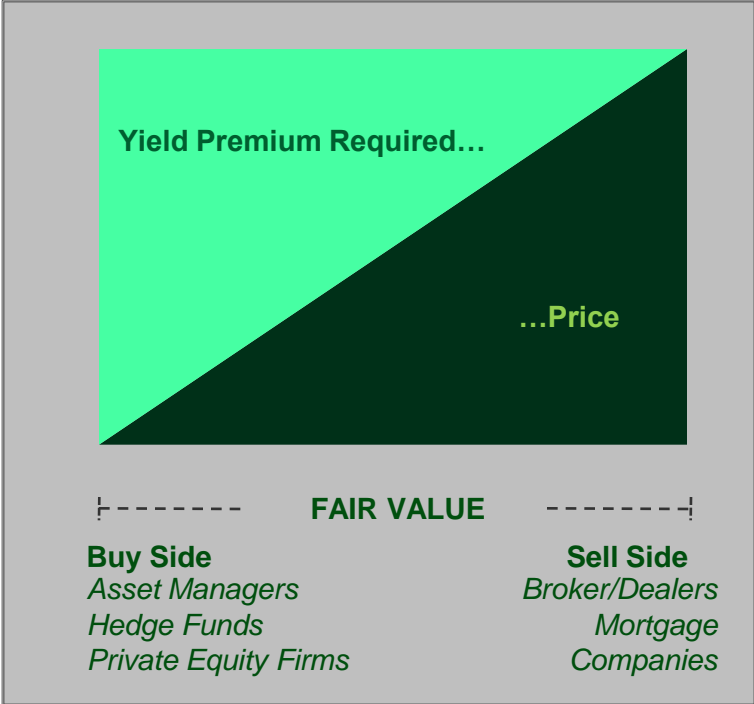
An entity-wide approach with clear responsibilities

Accounting Policy	Modeling/ Analytics Oversight	Operations/ Middle Office	Business Unit	IPV	Valuation Advisory Committee
<ul style="list-style-type: none"> • Defines fair value accounting framework and related policies, e.g., de Minimis • Defines external reporting requirements 	<ul style="list-style-type: none"> • Approve use of new models or model applications • Resolves disputes regarding financial statement Model and Analytics usage and appropriateness • Review and approve the controls framework and significant changes to process and controls for models 	<ul style="list-style-type: none"> • Executes pricing methodologies • Validates data accuracy and completeness • Validates that approved methodologies are applied as designed 	<ul style="list-style-type: none"> • Review prices for reasonableness • Recommends valuation methodologies 	<ul style="list-style-type: none"> • Provide secondary and independent verification of fair value prices and valuation inputs • Valuation process and control oversight • Determine tolerance thresholds by which to identify valuation exceptions. • Reviews valuation methodologies. 	<ul style="list-style-type: none"> • Management oversight and control of valuation policies • Resolution of disputes or exceptions between business unit and IPV functions • Review all new and changed significant valuation methodologies and assumptions • Approve the valuation controls framework and significant changes to processes, controls and valuation practices • Make the ultimate judgments relating to fair value estimates.

- Be reasonable, it should show in your assumptions and judgment
- Calibrate models regularly, the velocity of market change isn't slowing down anytime soon
- Keep methodologies current, and your staff more current,
- Get your auditors involved, early and often,
- Know your vendors, if you haven't met them at their site in the last 12 months, you should do so immediately
- Be consistent, reduce confusion
- Obtain and document market color and current data - leverage senior level market practitioners
- Use plenty of common sense, investors will love you for it.

Your determination of Fair Value may be complicated by your view of IRR.

There are a many “right” prices!



At the same time, there are a many “wrong” prices!

The reality is that you can probably support a fair value price almost anywhere along the spectrum.

The valuation source used is driven by the type of instrument, the availability of the source and operational expedience. Firms typically use multiple valuation sources

Level 1

FAS 157

Valuation Source	Description	Advantages	Considerations
Dealer Price/Spread Quote / Volatility Quote	Direct price, spread or volatility is received from third-party reputable dealer(s) on each CUSIP requested	<ul style="list-style-type: none"> - Accurate (dealers make markets in a variety of products) - Quick to respond to changing markets - Skilled at pricing complicated products - Easy to Audit 	<ul style="list-style-type: none"> - Takes longer to obtain - Dependent on dealer and trader - Can't price large volumes of CUSIPs in a timely manner - Many dealers no longer providing indicative bids
Dealer Prices proxy instrument or Grids	Dealer prices proxy instruments or fill s out grid with prices, spreads or volatilities for proxy bonds and that information is used to price a larger population of CUSIPs	<ul style="list-style-type: none"> - Instrumental in pricing a large number of like CUSIPs - Produces reasonable results - Easier for the dealer 	<ul style="list-style-type: none"> - Requires judgment of bucketing, aggregation, and selection of grids. The granularity of each can have some impact on pricing. - Grids require changes to reflect the changing nature of markets and the portfolio composition - More complicated to audit than dealer quotes
Third-Party Pricing Services	Price quotes obtained for requested CUSIPs from independent, third-party pricing services	<ul style="list-style-type: none"> - Timely and automated - Industry standard - Easy to audit 	<ul style="list-style-type: none"> - Lack of transparency - Not as reliable as dealer quotes for pricing complicated products - Can be slow to react to market changes
Model-Based Pricing	Models are used to calculate a price using economic information but without a strong tie to market pricing of similar instruments	<ul style="list-style-type: none"> - Automated, efficient and the only method available to price some illiquid securities or loans - Inputs and assumptions behind models are known 	<ul style="list-style-type: none"> - Subjectivity around models and inputs - No direct third-party price driver - More difficult to audit
Model-based Using Dealer Proxies	Dealers provide spreads or volatilities on proxy bonds	<ul style="list-style-type: none"> - Reasonably accurate for pricing large populations of less homogeneous securities - Model calculates difference in price between proxy and individual securities. Limited impact on resulting price. - Consistent pricing period over period that adjusts with market pricing of proxies - Inputs and assumptions behind models are known 	<ul style="list-style-type: none"> - Some embedded underlying assumptions in models can effect results - More complicated to audit given nature of models and that the final price is not entirely externally produced - Choice of proxies and mapping of individual CUSIPs

Level 3

Liquid



Illiquid

Verification Technique	Definition	Advantages	Constraints
Tolerance band Analysis	Deriving an acceptable range bound by a minimum price and a maximum price based on vendor or benchmark data to assess the price	<ul style="list-style-type: none"> - Acknowledges reasonable market trading conventions - Coupled with a materiality threshold, promotes focusing on the Material Exceptions 	<ul style="list-style-type: none"> - Trade off between number of tolerance margins established vs. number of different instruments
Benchmarking	Deriving a price based on an established benchmark	<ul style="list-style-type: none"> - Reasonably accurate for valuing large populations of homogeneous securities 	<ul style="list-style-type: none"> - Need to be mindful of subtle differences in structures which may result in significant valuation differences
Re- Performance	Deriving a price using the methodology (or similar)	<ul style="list-style-type: none"> - Expedient - Ensures proper execution of pricing, “second set of eyes” - Used when no alternative processes are available 	<ul style="list-style-type: none"> - Requires acquisition of similar tools and/or models
Analytical Review	Performing additional analysis, including examination of source documents, additional dealer information, cash flow analysis and utilizing tools and models to corroborate valuations.	<ul style="list-style-type: none"> - Evidenced based 	<ul style="list-style-type: none"> - Time consuming, may be manually intensive. - May Require acquisition of similar tools and/or models - With a large portfolio, should be used only on Material Exceptions
Methodological Review	Review methodology used for pricing. Particularly useful for highly illiquid products	<ul style="list-style-type: none"> - Expedient - Doesn’t require technology - Ensures proper methodology documentation 	<ul style="list-style-type: none"> - Requires significant product knowledge to perform proper assessment

Optimally, the sources used for verification should be different than those used for pricing

Firms should focus on material exceptions, and develop a controlled resolution process to facilitate Accounting close timelines

Step 1 – Assess if “adverse change” occurred in estimated cash flows

A. Compare PV of remaining cash flows estimated at initial transaction date (or last revised estimate) to

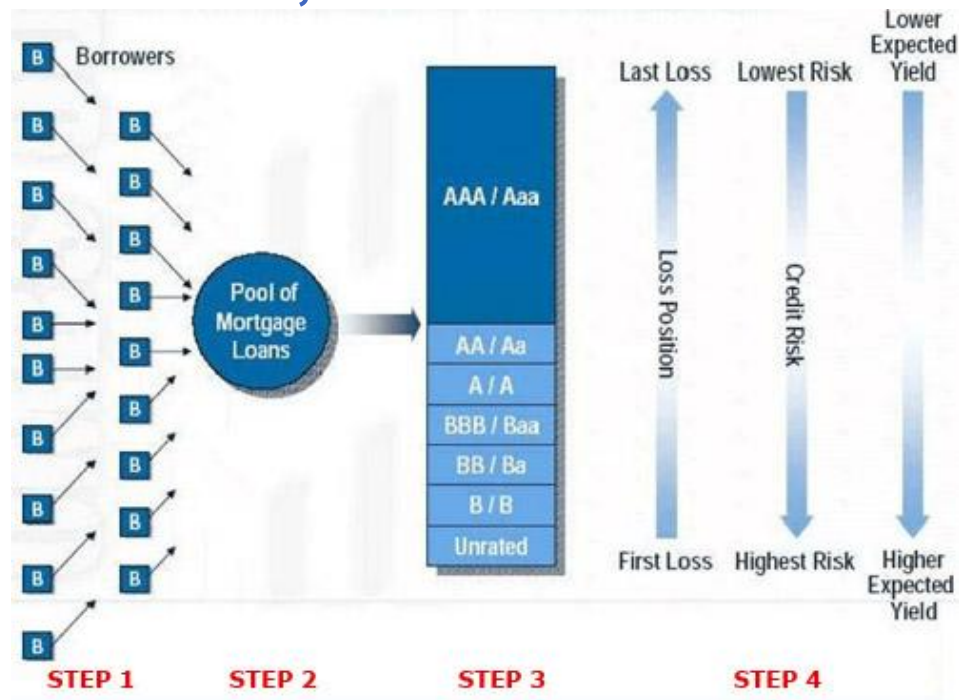
B. PV of current “best estimate” of cash flows to be received

- “Best estimate” = those used by a market participant
- Adverse change = when A exceeds B

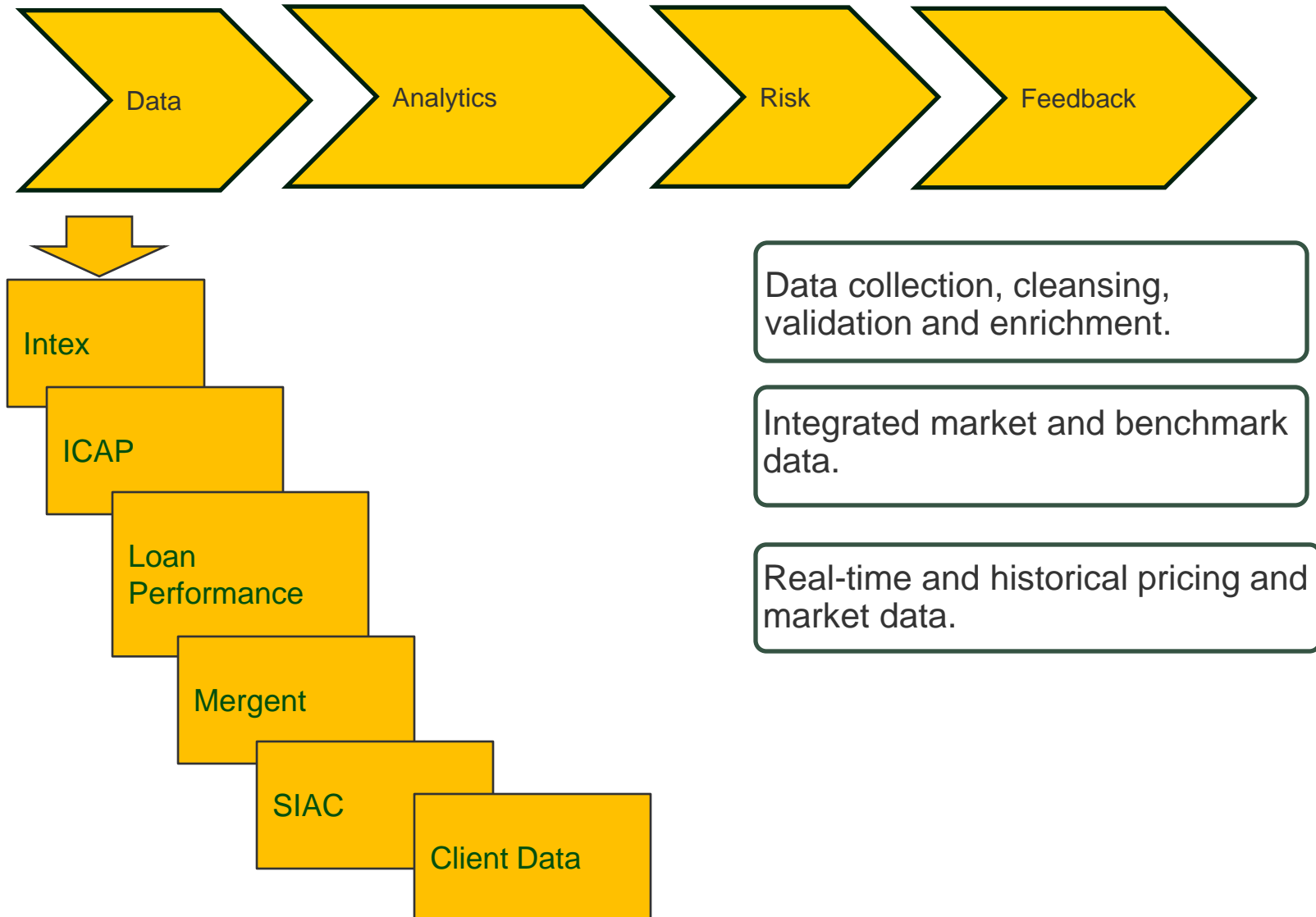
Step 2 – Determine if FV is below current carrying amount

- May result in write down to its current FV
- New cost basis is established
- Accrete future income based on updated cash flow projections

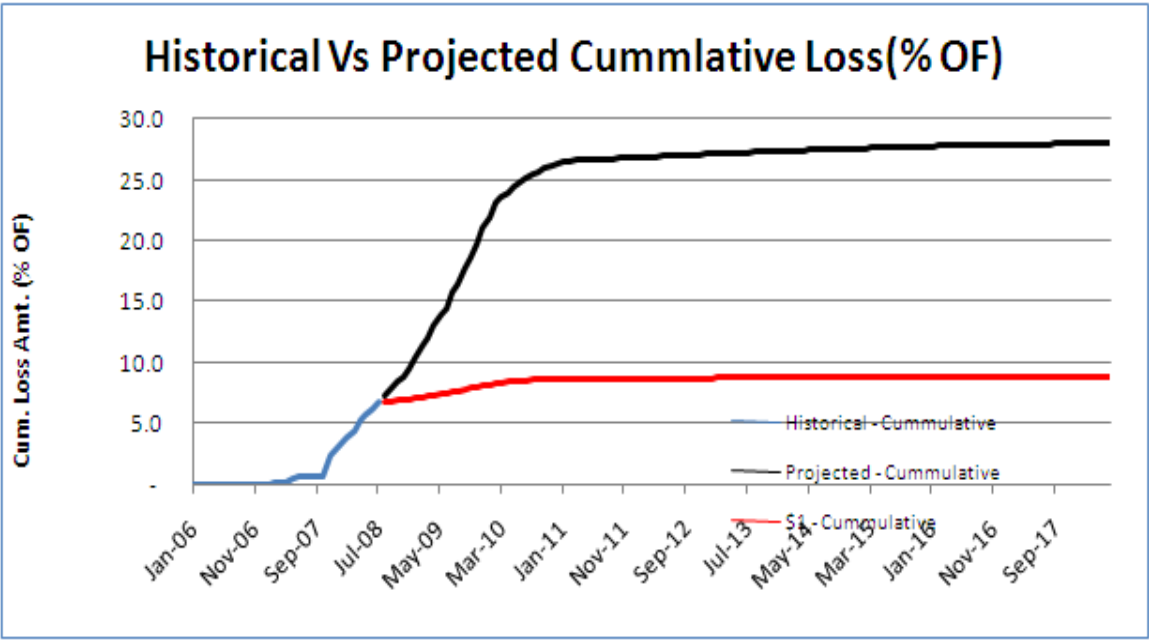
MBS is not the most complex financial structure to value, BUT



Source: http://www.urbandigs.com/mortgage_dos_donts/



- Loan level characteristics will drive performance, delinquencies and roll rates (the percentage of loans that move from one stage of delinquency to another).
- Roll rates drive estimates of the percentage of delinquency and foreclosure or charge-off.
- Conventional spreadsheets are not up to this task; estimating the effects of impairment at this level requires sophisticated financial modeling.



- Loan Loss Reserving is a valuation allowance that reflects the estimate of credit losses.
- Reserve levels determined using a systematic methodology and should be adequate enough to absorb probable credit losses.

Excessive reserves
reduce capital
utilization



Inadequate reserves
put capital at risk

— Rising Delinquencies

- Larger reserve bases
- Estimated loss reserve provision for pipeline delinquencies

— Frequencies and severities will rise sharply

- Especially for 2006 and 2007 origination years
- Especially in certain regions (Florida, CA, etc.)
- Especially in certain products/purpose (IO/certain ARMs/Investor Loans)

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