

Wizards of Odds

The US Sub-Prime Mortgage Crisis and
the Rating Agencies

Abstract

The last twelve months have brought American finance to the edge of the abyss. The main issue is now whether the global financial system will be able to recoil from the abyss, restore the shattered confidence of investors and perhaps launch a brave, new and scientific world of risk management. On the other hand, a distinct possibility exists that our leadership will fail the people once again and fall back into the feudal world of traditional corporate finance, leaving most of us behind.

The so-called sub-prime mortgage crisis has nothing to do with either mortgages or sub-prime borrowers, most of whom are normally called hard-working citizens in any event. Rather, it stems from a fundamental lack of understanding of the non-linear foundations of structured finance, something that until now had shed countless blessings on the world economy, most noticeably in micro-finance. Structured finance is the only viable and self-consistent mechanism *via* which the poor and dispossessed throughout the planet can access scarce financial resources at reasonable rates, as Grameen Bank and others have shown. The predicament in which securitization, the brainchild of the main US rating agencies, currently finds itself arose from their failure to understand their own creation from the ground up. As a result, we are now standing at a crossroads of financial history, a gigantic opportunity to make radical and momentous changes to the way capital is allocated around the globe. However, structured finance must first be reborn as freedom under control. How is this supposed to happen?

In this talk, we briefly sketch the obscure origins of the crisis and outline how the entire conceptual basis of structured finance needs to be rethought, in light of recent events, so finance can be placed on a stable orbit while continuing to serve the needs of all those who have the right to expect better from their appointed officials.

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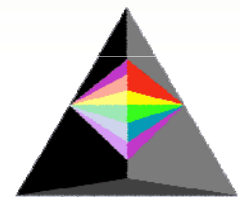
Structural Reasons for ABS Ratings Arbitrage

- **Fragmentation:** In today's market, the structuring, underwriting and surveillance of ABS are separate activities performed by "silos" within a financial organization, which
 - often have distinct, not necessarily convergent methods; and
 - are mutually unaware of what the other does.
- **Imperceptibility:** A mismatch in the allocation of resources to origination and surveillance of ABS is chronic and pervasive in all credit-granting institutions
 - Profitability is directly related to underwriting rather than after-market support
 - But, surveillance is analytically more difficult than structuring
- **Inertia:** Monitoring personnel are expected to close the gap between the initial rating assessment and current performance data using human judgment and ratio analysis.
This goal is patently unfeasible without a model.



A Market-Wide Misunderstanding

- The problem isn't that the future is hard to predict. The future is not hard to predict; the future is impossible to predict.
- The problem is that structured ratings are being used to do things for which they weren't designed.
- Whereas it is impossible to predict the future absolutely, it is still feasible to *refresh ratings systematically* using the rich data set contained in the servicer's report.

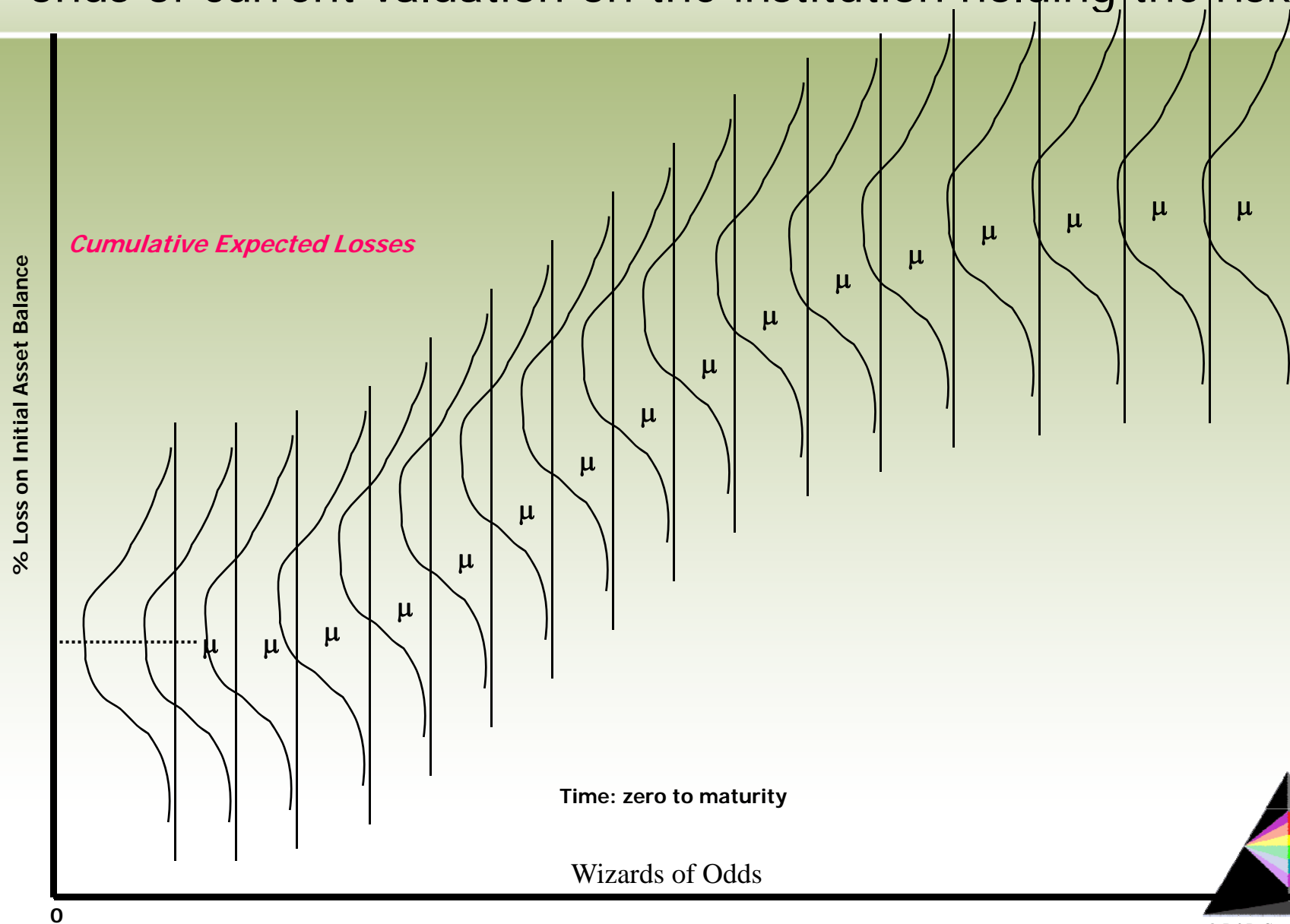


The Basics of Structured Security Valuation

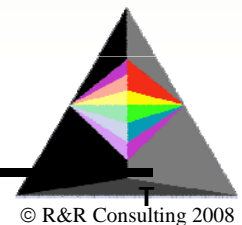
- **Transaction Input:** the main transaction document at our disposal for subsequent analysis is the prospectus. The legal document is the PSA, but the latter is normally not available to the general public. However, the good news is that valuation can be carried out without it.
- **Calibration:** each transaction needs to be calibrated to market reality. This is because, although two similar transactions might appear to have been underwritten with the same set of assumptions, in fact each one is slightly different and implies a slightly, and sometimes not so slightly, different unexpected loss estimate. Thus, calibration is a necessary step if one wants to ensure that the initial market-implied valuations and ratings are respected. This is the only way the system can remain self-consistent.
- **Monitoring:** Each month, the data contained in the target deal's servicer report are used to true-up the valuations of all securities within the transaction via a Monte Carlo simulation driven by updated figures for credit losses, prepayments and delinquencies.



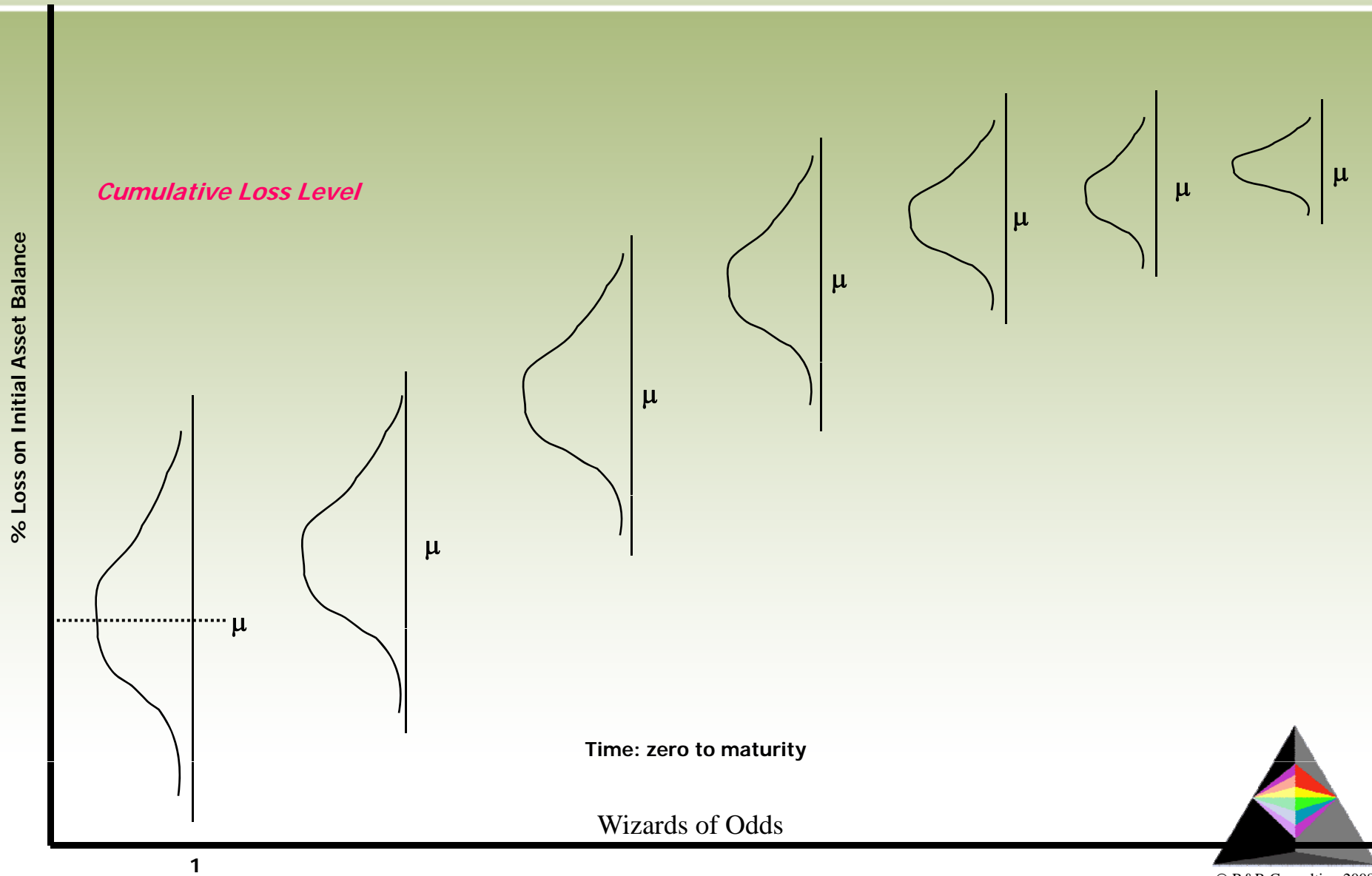
Credit ratings assume a static loss distribution, which places the onus of current valuation on the institution holding the risk.



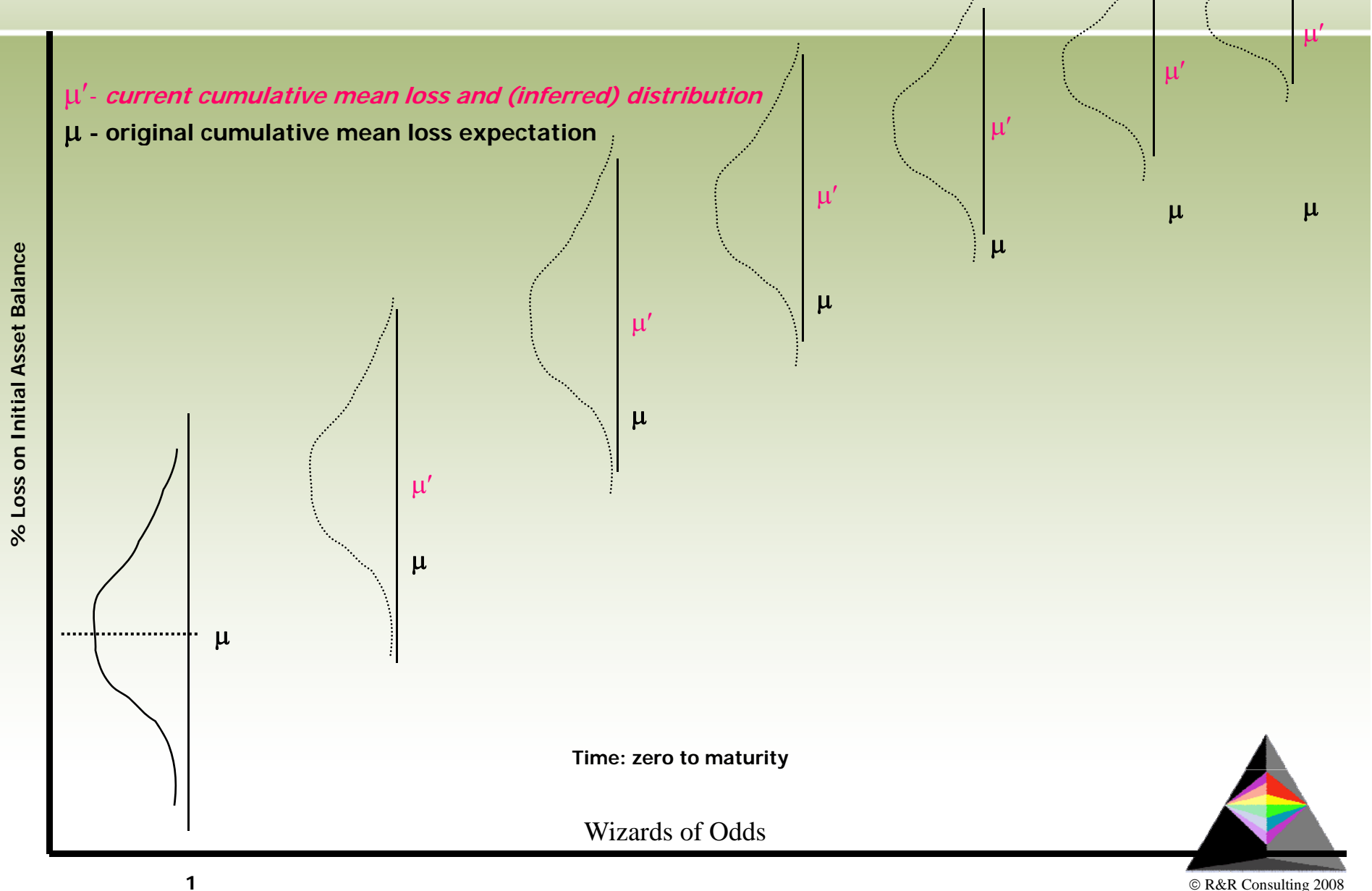
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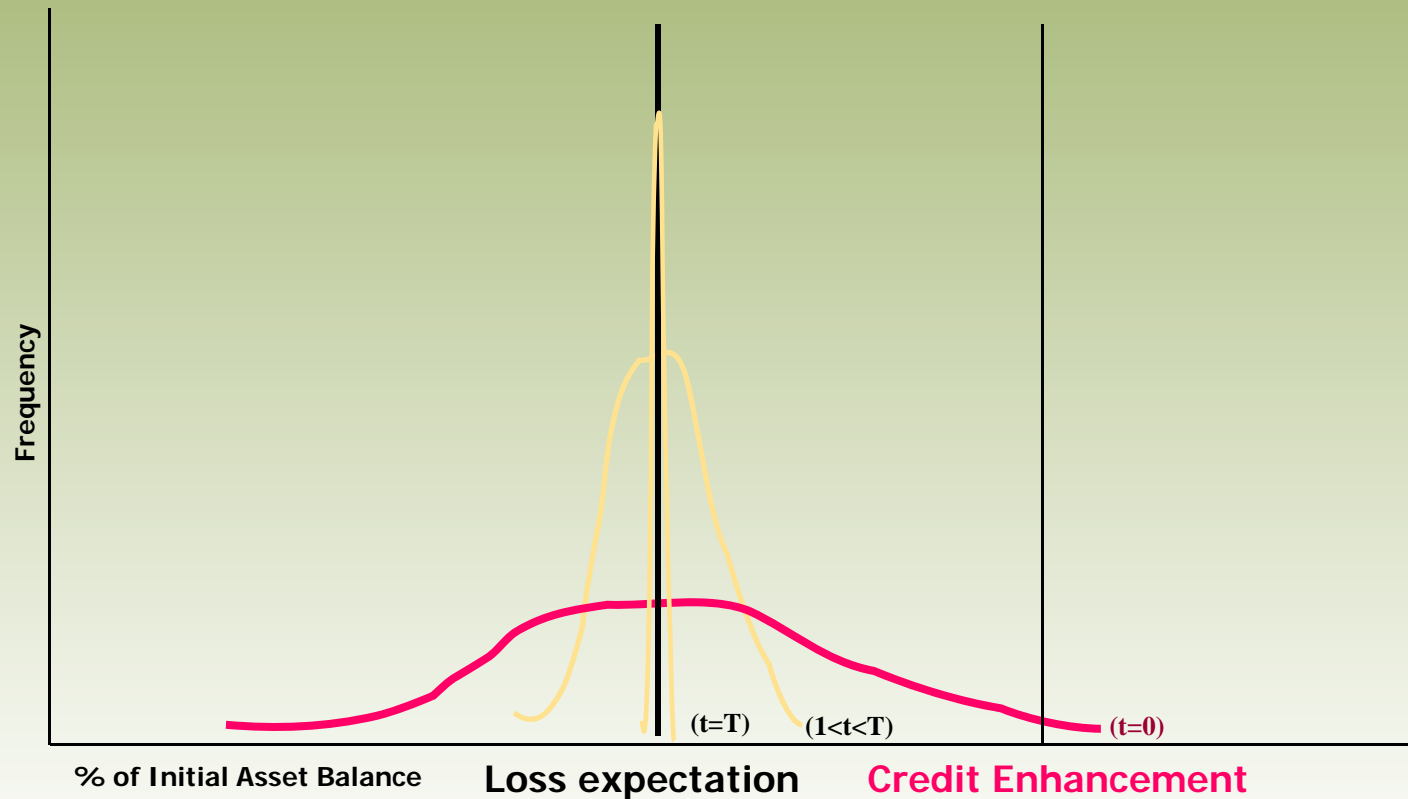
The passage of time provides an invisible dimension of extra protection to *all* transactions properly-structured at origination.



However when credit deterioration exceeds the original allowance, the security is impaired. Its price *must* be marked down.

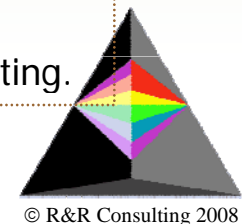


Waste-reduction: the case for continuous monitoring/upgrading.

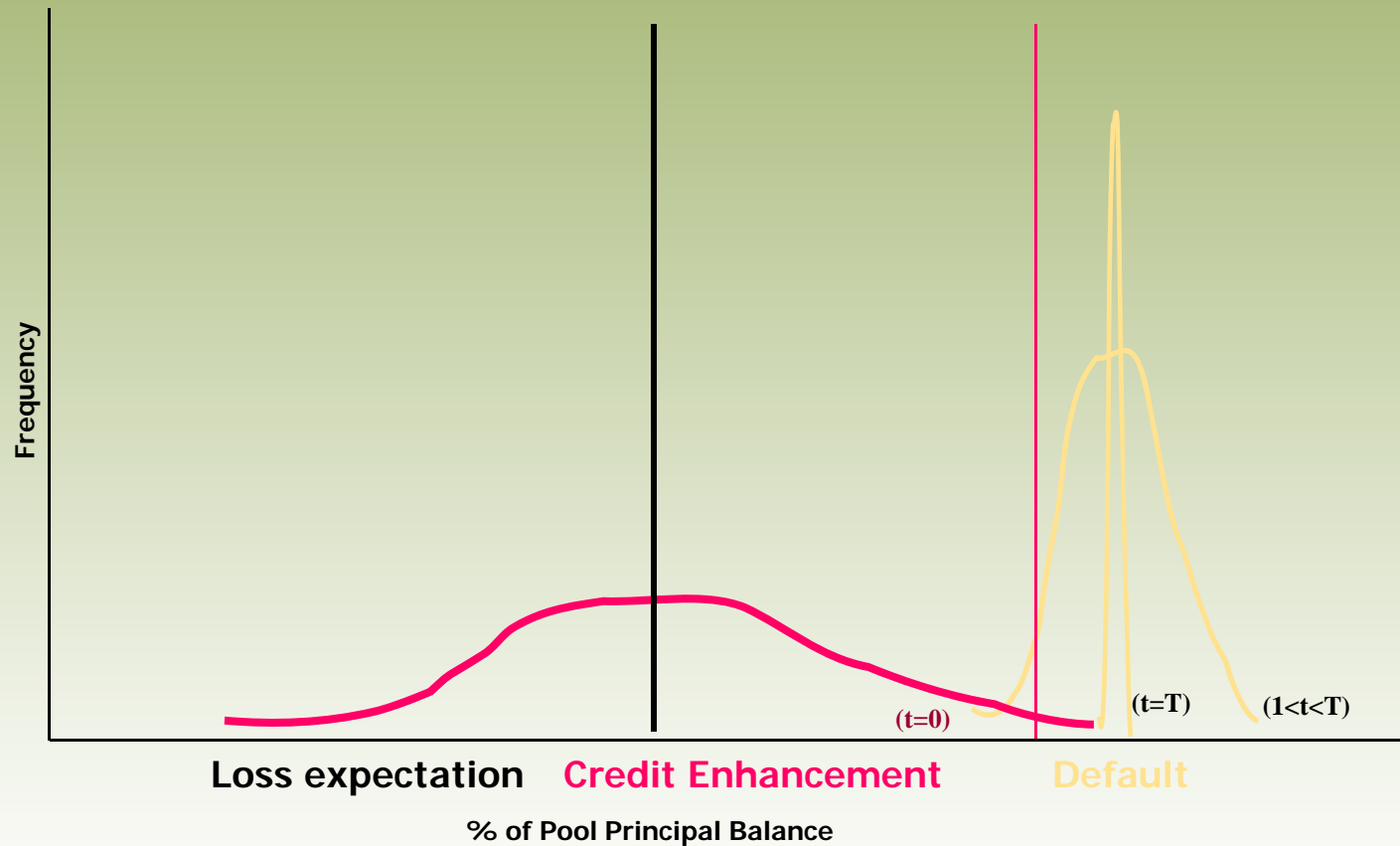


1. Security losses occur to the right of the intersection of CE and the Loss Distribution. The area under the curve to the right of the dotted line is the implied loss on the security.
2. Updated analysis shows this tranche to be excessively collateralized relative to its original rating.

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Shock-avoidance: the case for timely monitoring/downgrading.



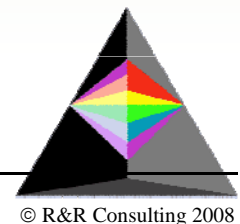
1. Security losses occur to the right of the intersection of CE and the Loss Distribution; the area under the curve to the right of the dotted line is the implied loss on the security.
2. Updated analysis shows this tranche as severely under-collateralized relative to its original rating.

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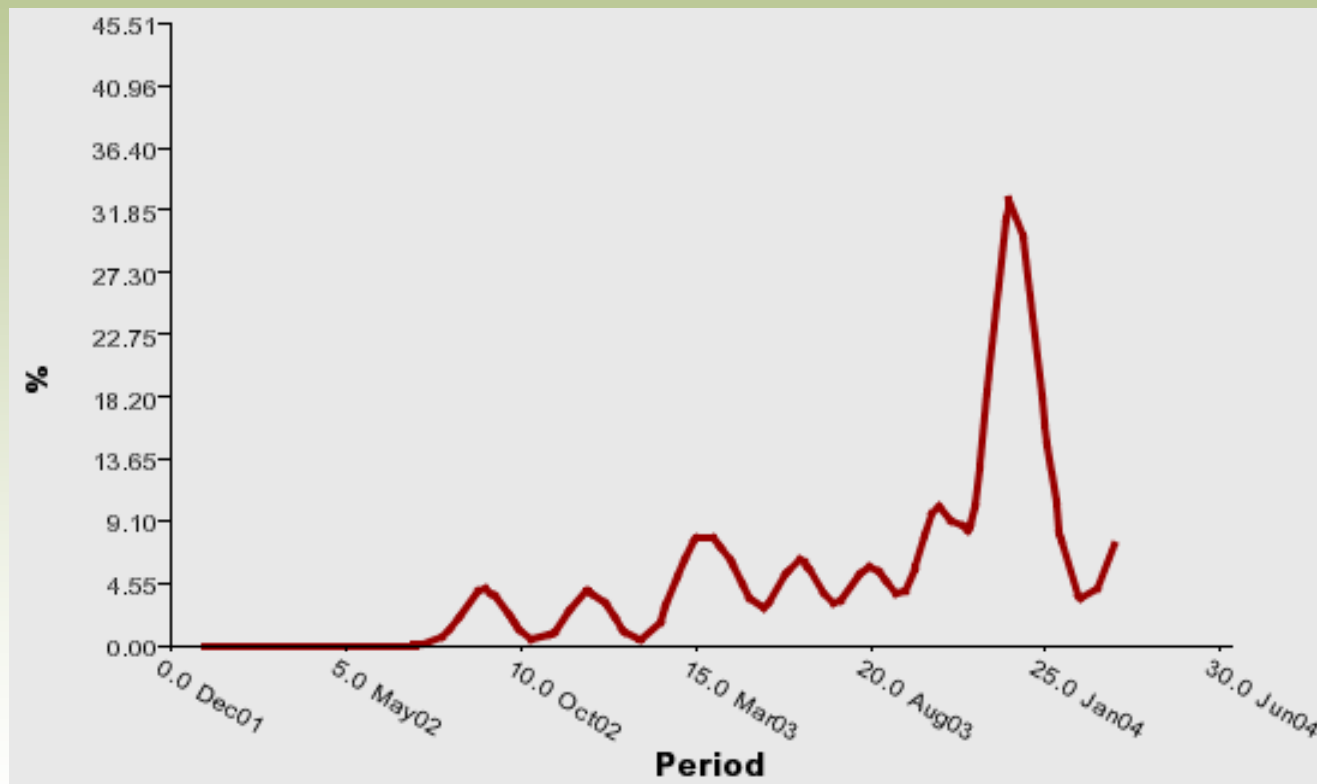
The Original Sins: Arrogance and Ignorance

1. The root cause of the sub-prime crisis is not the greed or arrogance of Wall Street banks, something that has always existed, even when markets were stable. Bank-robbers rob banks and will continue to do so.
2. Rather, it is the ignorance and arrogance of rating agencies, the “policemen” of the capital markets. The cops did not stop the bank robbers. How could they?
3. In turn, this follows from a widespread misunderstanding of value in structured finance as opposed to corporate finance. Structured ratings are **dynamic**; corporate ratings are **static**.
4. Unless and until this is understood and explicitly brought to light, we will not be able to launch structured finance onto a stable orbit. There will be more crises, just when we thought it was safe to go back to the trading floor!

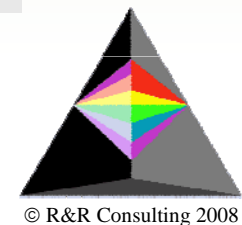


Ameriquest Mortgage Securities 2001-3

Annualized Periodic Defaults

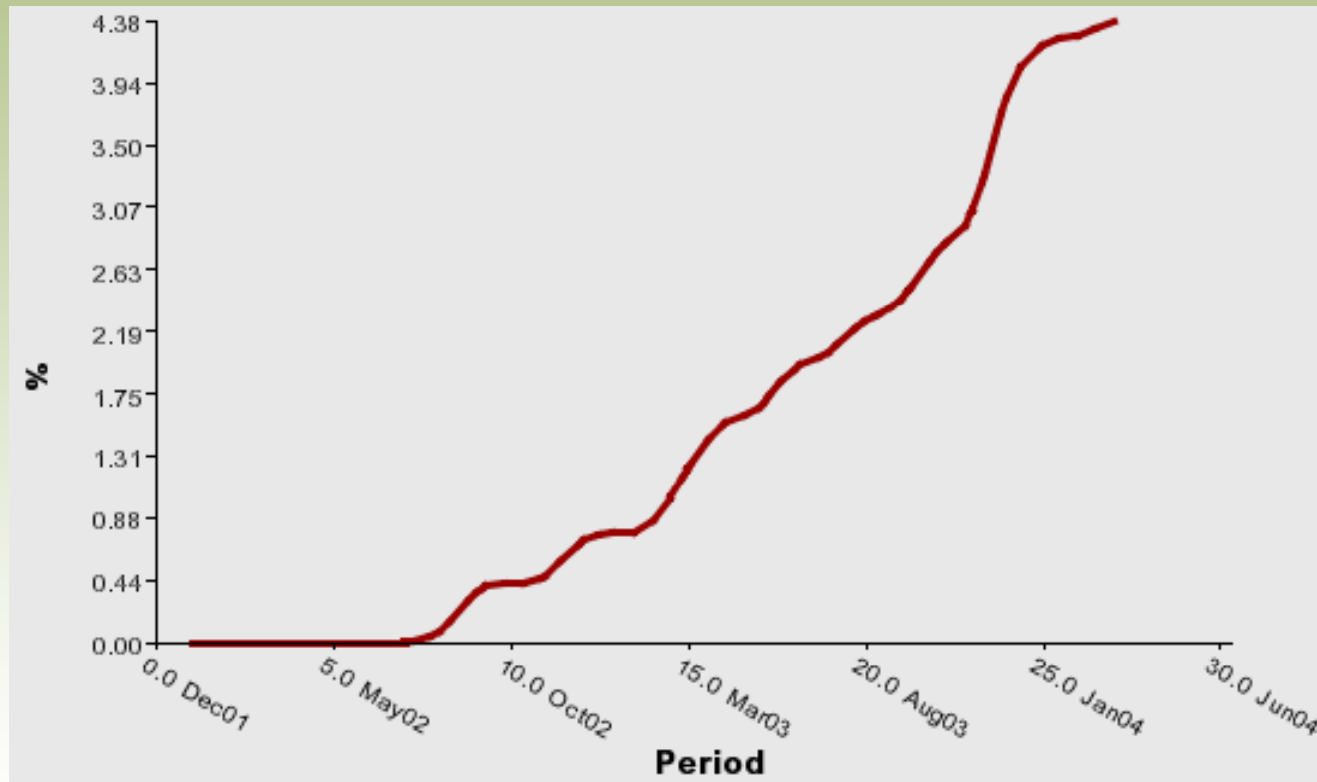


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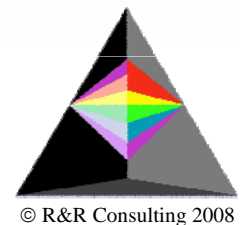


Ameriquest Mortgage Securities 2001-3

Cumulative Defaults

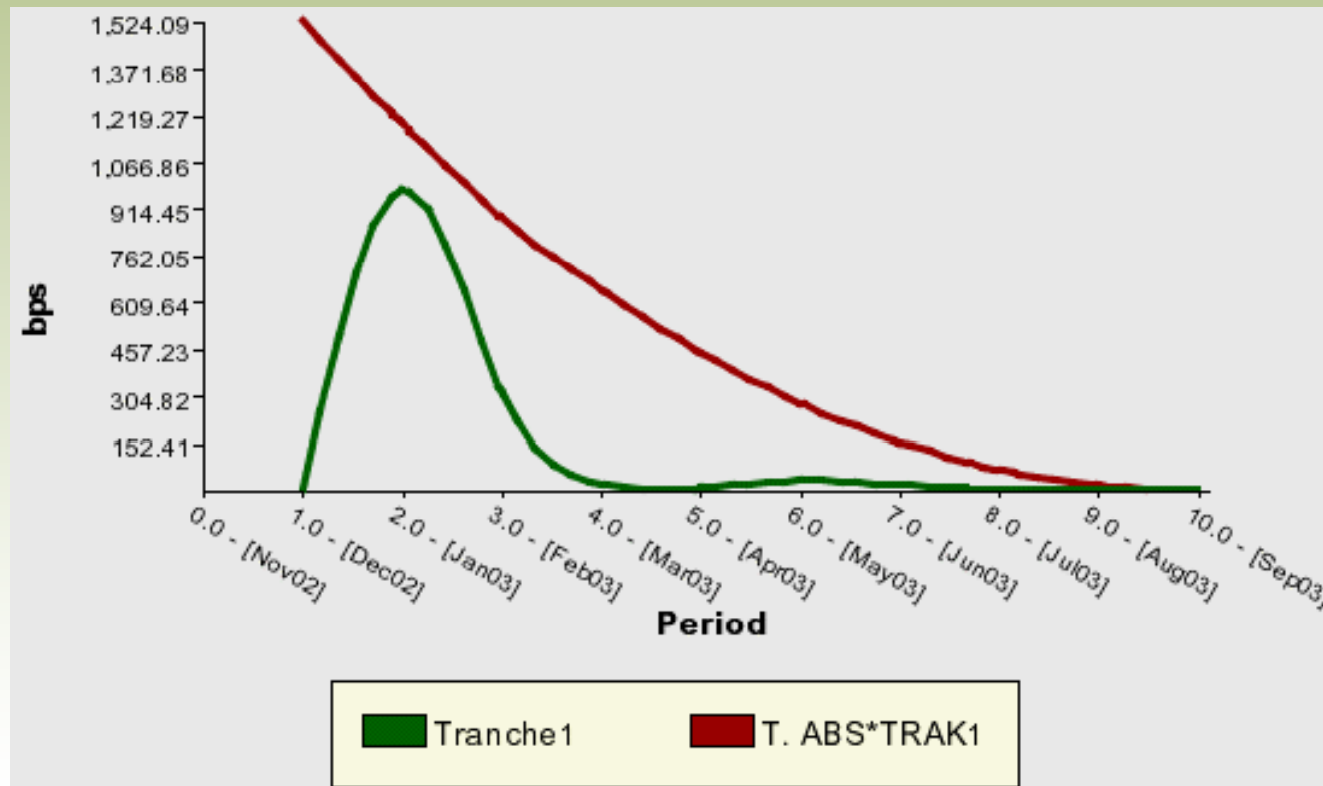


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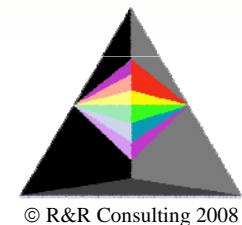


Salomon Smith Barney Auto Deal 2001-1

Theoretical vs. Actual B-1 Tranche (A)

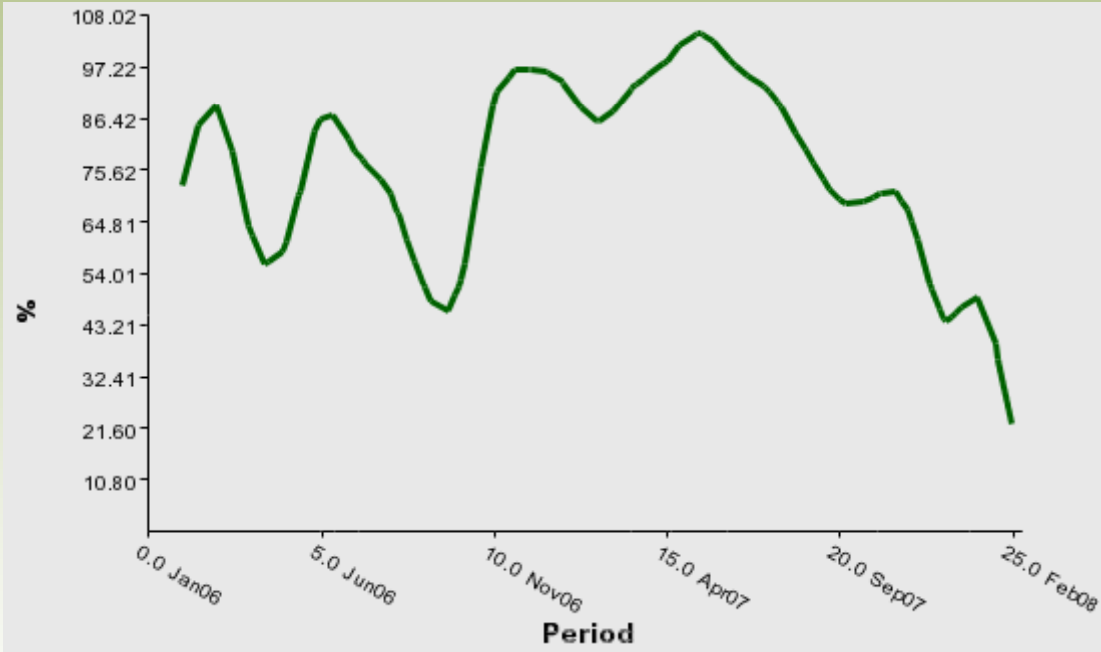


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Bear Stearns Asset Backed Securities I Trust 2006 EC1

Class M1 Fair Market Value

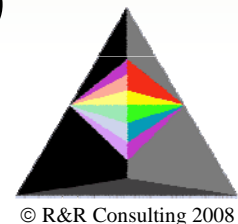


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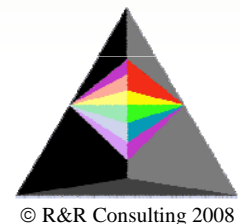
Cursory Review of Attitudes vis-à-vis the Truth from Famous People in History

1. “Aircraft flight is impossible” (Lord Kelvin, ca. 1880)
2. “A nice, intelligent woman would not want to vote” (US President G. Cleveland, ca. 1890)
3. “The Titanic is unsinkable” (CEO, White Star Lines, ca. 1911)
4. (Babe) “Ruth made a grave mistake when he gave up pitching” (T. Speaker, ca. 1920)
5. “We pretty well know how to price mortgage risk” (Countrywide Financial, ca. 2005)
6. “Our actions in the sub-prime market have been fully consistent”, (Standard & Poor’s, ca. 2007)
7. “I’m a steamroller” (Governor Elliot Spitzer, ca. 2008)



How are We to Understand the Nature of Risk?

1. A risk is not a fact, i.e. defaulted bonds and Treasuries are both risk-free securities, but for opposite reasons.
2. Credit risk is stochastic and non-linear (stable)
3. Market risk is statistical and linear (unstable)
4. Value comes first, price second = there is an unavoidable asymmetry. Wall Street does not know this.
5. Q: Why not? A: The Chicago School of Economics
6. Primary market valuation keeps the system (market) stable. Otherwise, any disturbance will grow unchecked.
7. In the USA, a liquidity crisis is impossible since 27 December, 1913. What we now have is a valuation crisis.
8. The solution to the risk management dilemma: eliminate it
9. The resolution: cybernetics (Wiener; Plato)



Do you know the three big lies of NYC?

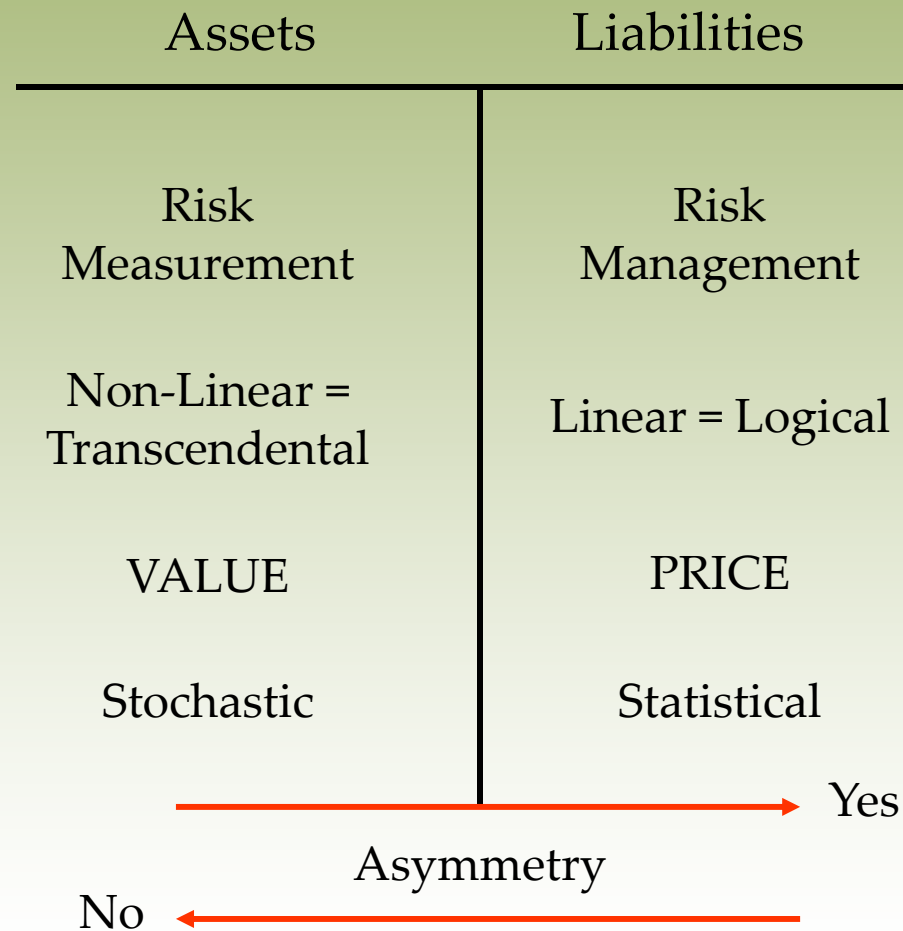
“I love being single.”

“Your table will be ready in 5 minutes.”

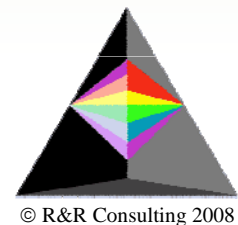
“We always hedge.”



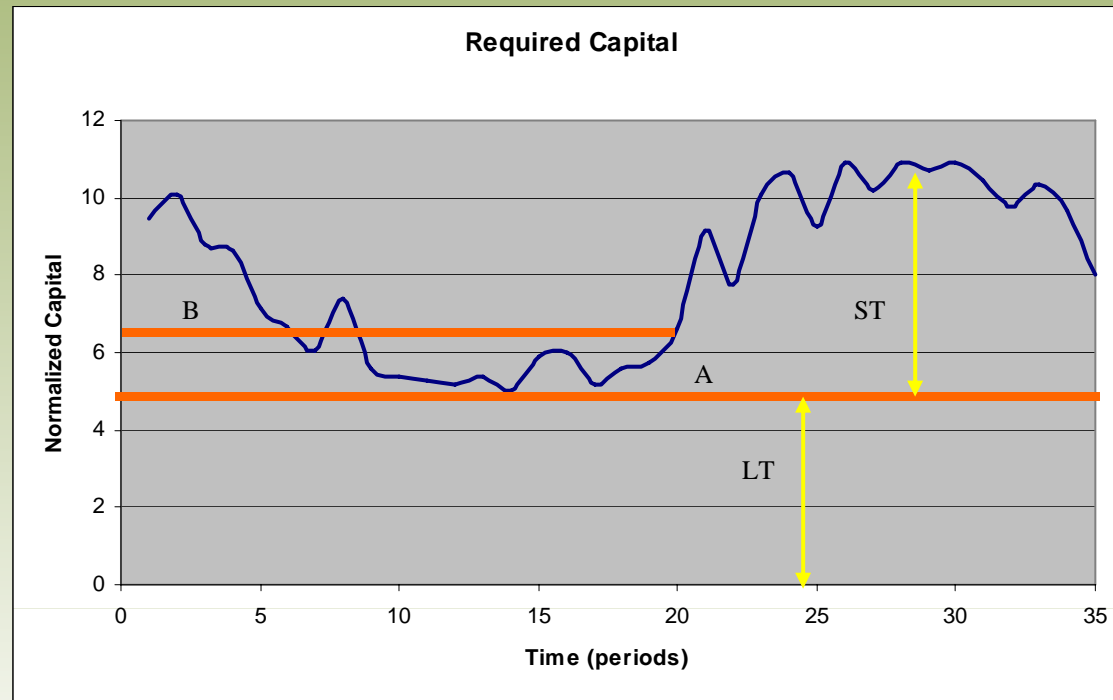
A Primer of Credit Risk Analysis



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A Rational Risk Management Framework



A Partitioning of Total Required Capital in Two Portions: LT and ST

$$C_0^{opt} \equiv v_0 + \sum_{n=1}^{\infty} v_a^n \cos \left[\frac{p_l n \pi}{p_s 2} \right]$$

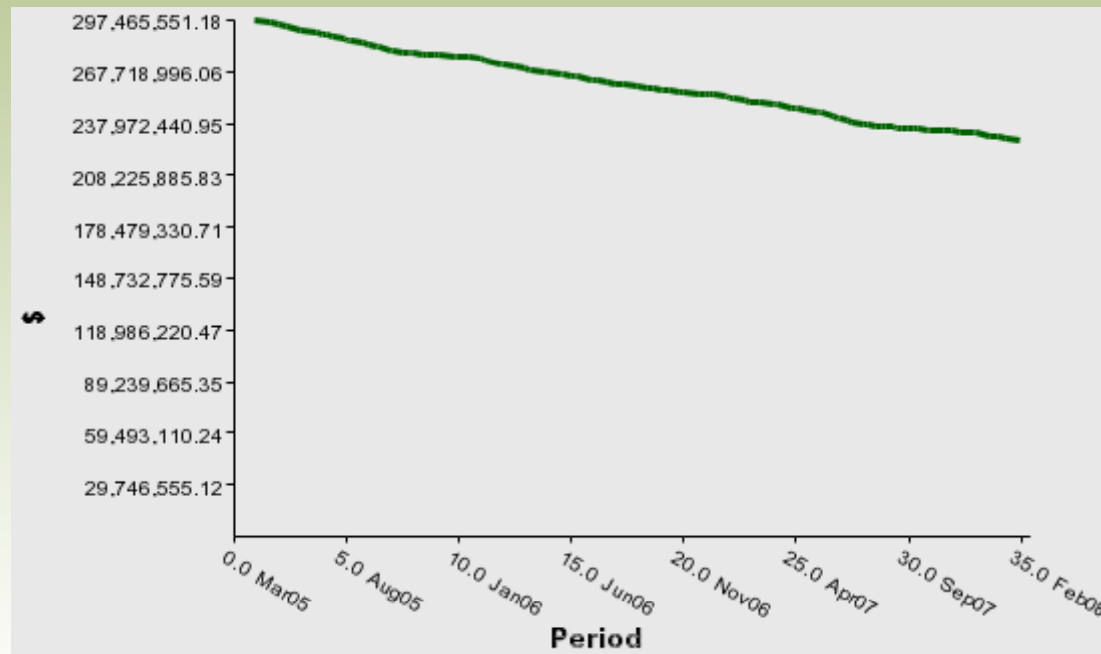
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Target Deal: Countrywide MBS 2005-10

CLASS	FITCH RATING	MOODY'S RATING	TYPE
Class A-1	AAA	Aaa	Senior
Class A-2	AAA	Aaa	Senior
Class A-3	AAA	Aaa	Senior/NAS/Super Senior
Class A-4	AAA	Aaa	Senior/NAS/Support
Class PO	AAA	Aaa	Senior/Principal Only
Class A-R	AAA	Aaa	Senior/Residual
Class M	AA	NR	Subordinate
Class B-1	A	NR	Subordinate
Class B-2	BBB	NR	Subordinate

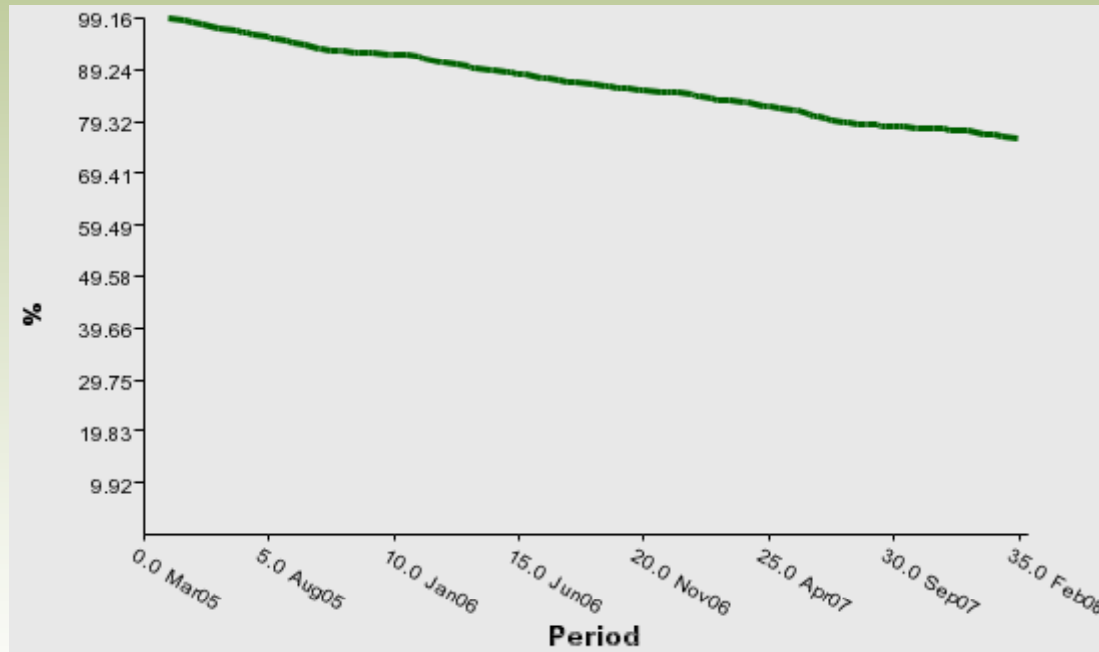
Pool Balance



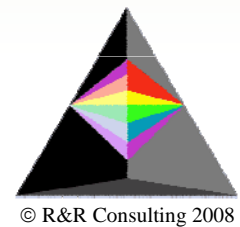
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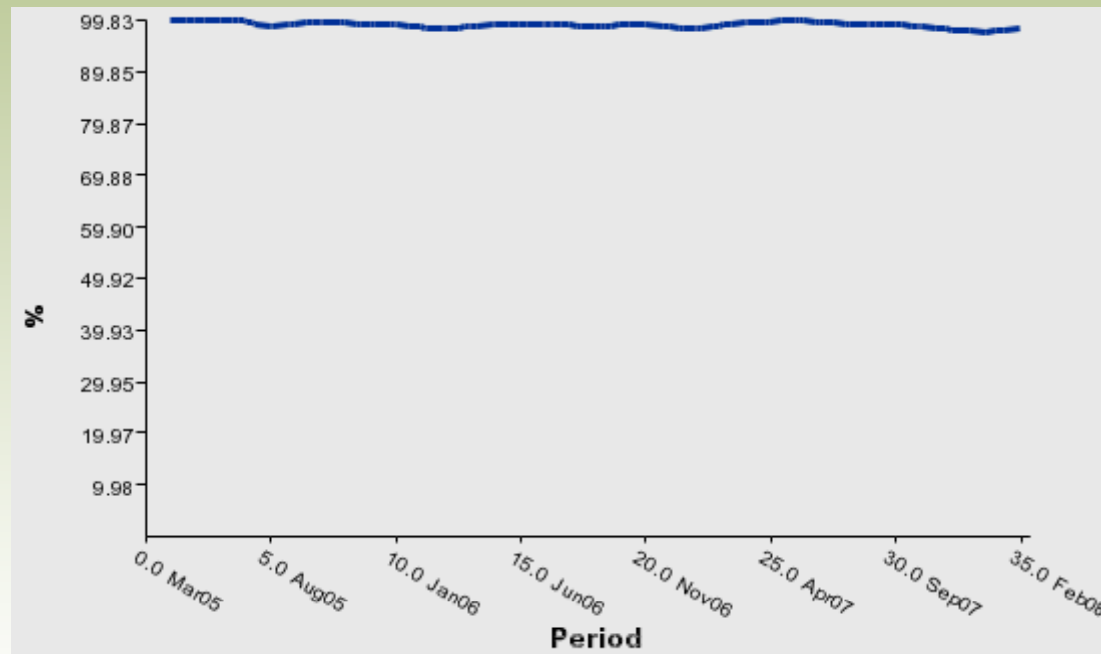
Pool Factor



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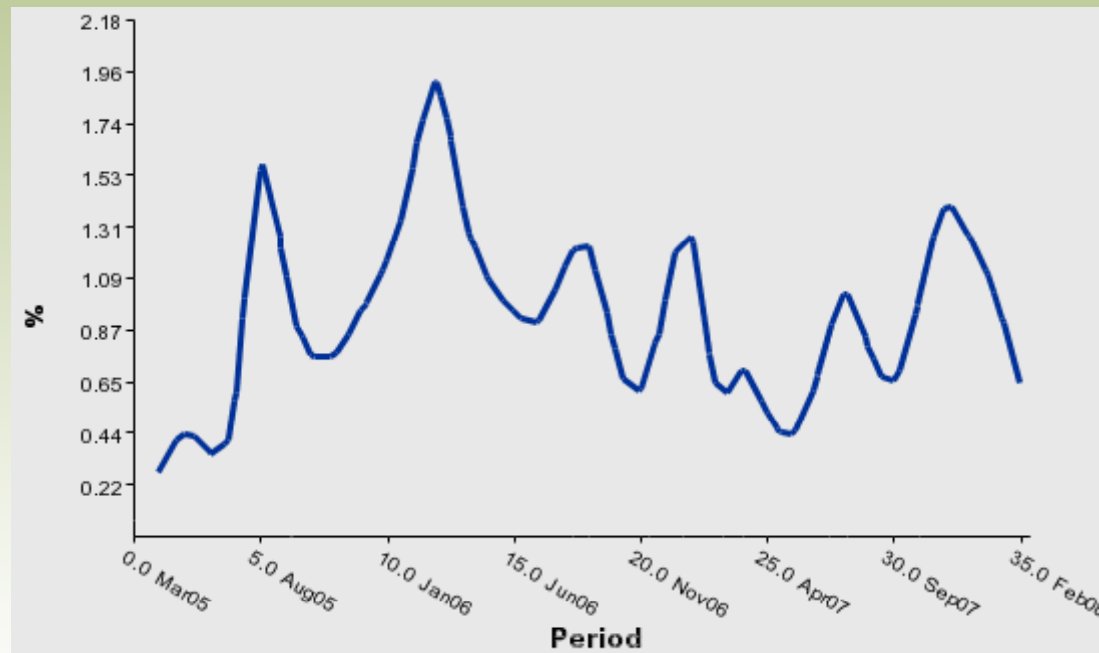
Current



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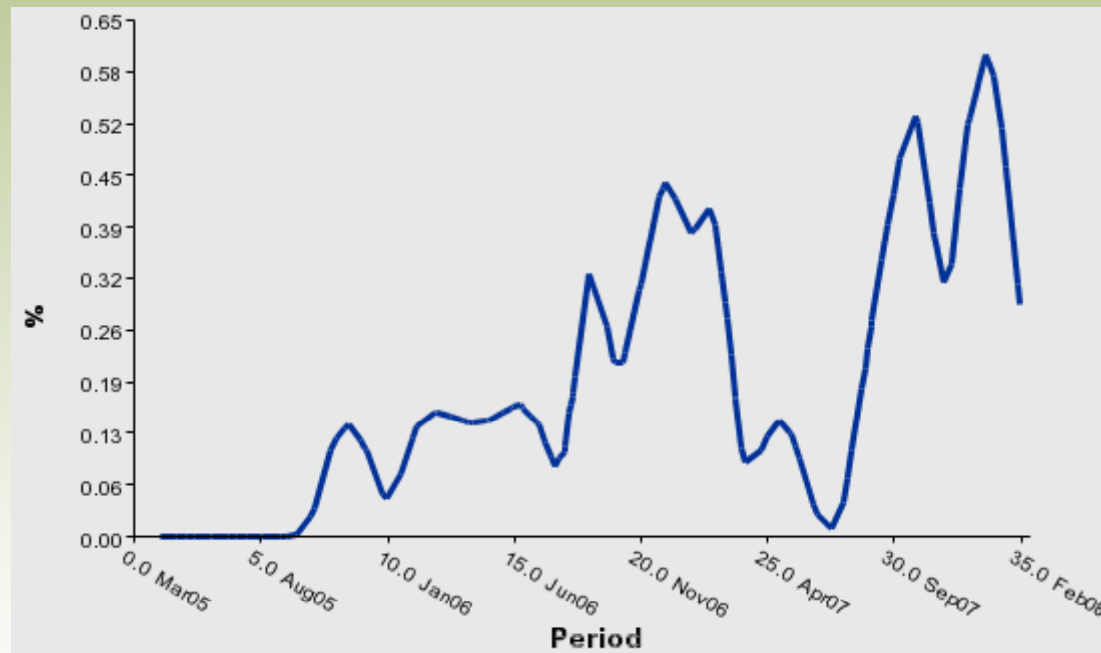
4-30 Days Delinquent



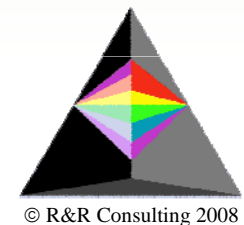
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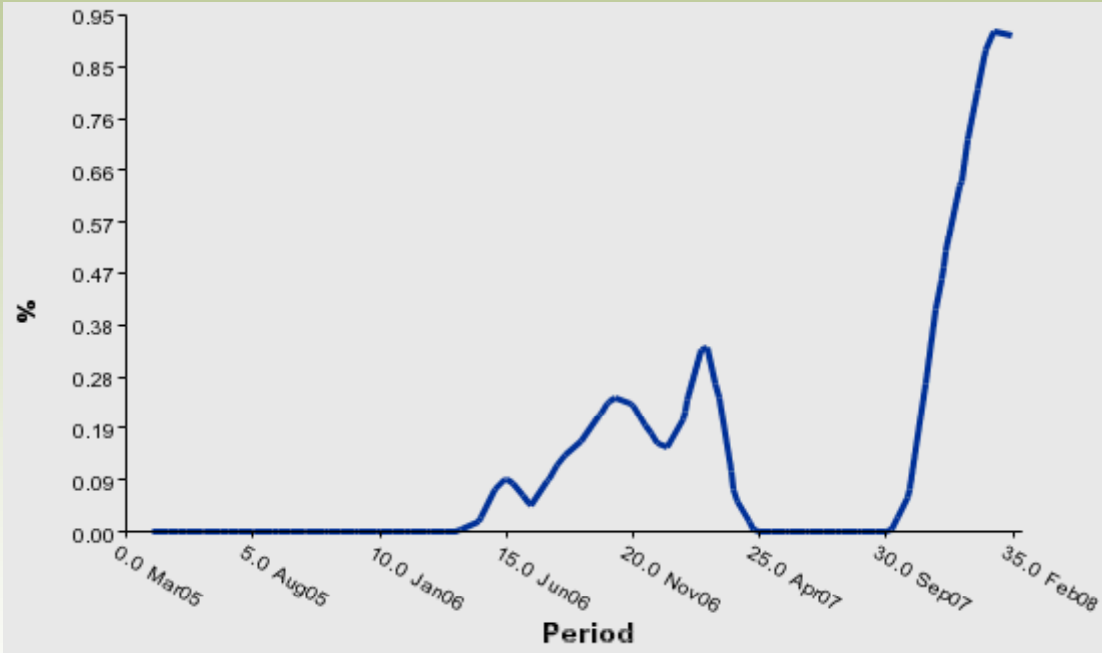
31-60 Days Delinquent



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90+ Days Delinquent

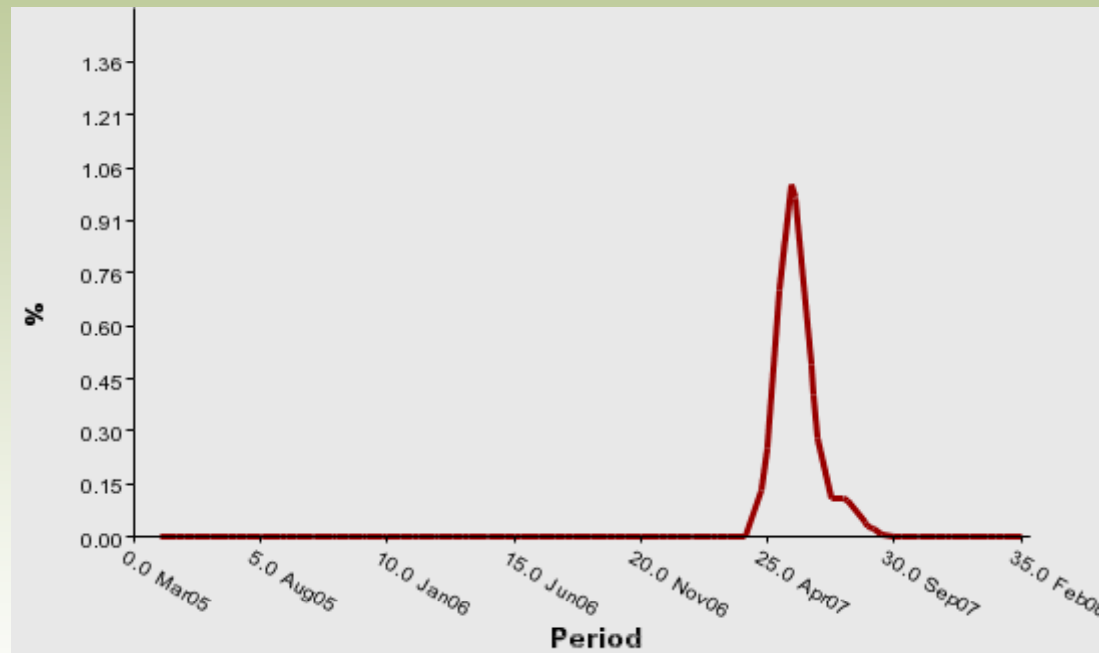


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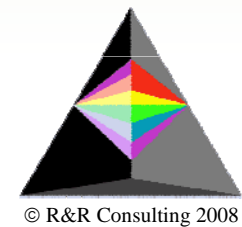


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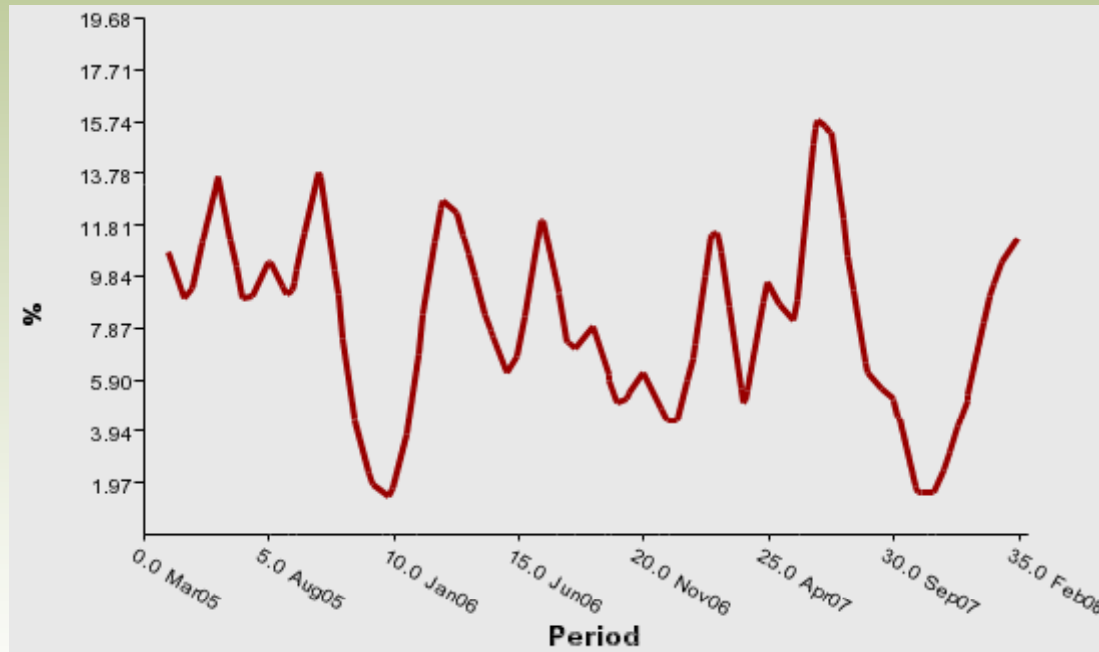
Periodic Annualized Defaults



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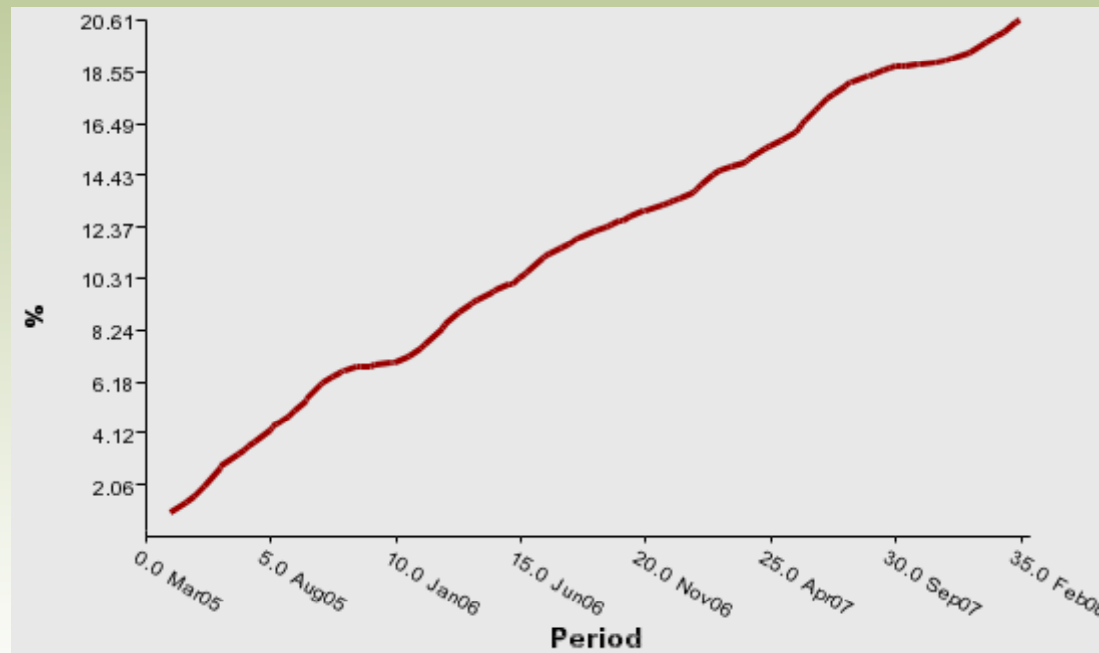
Periodic Annualized Prepayments



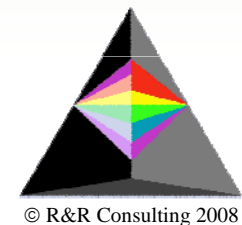
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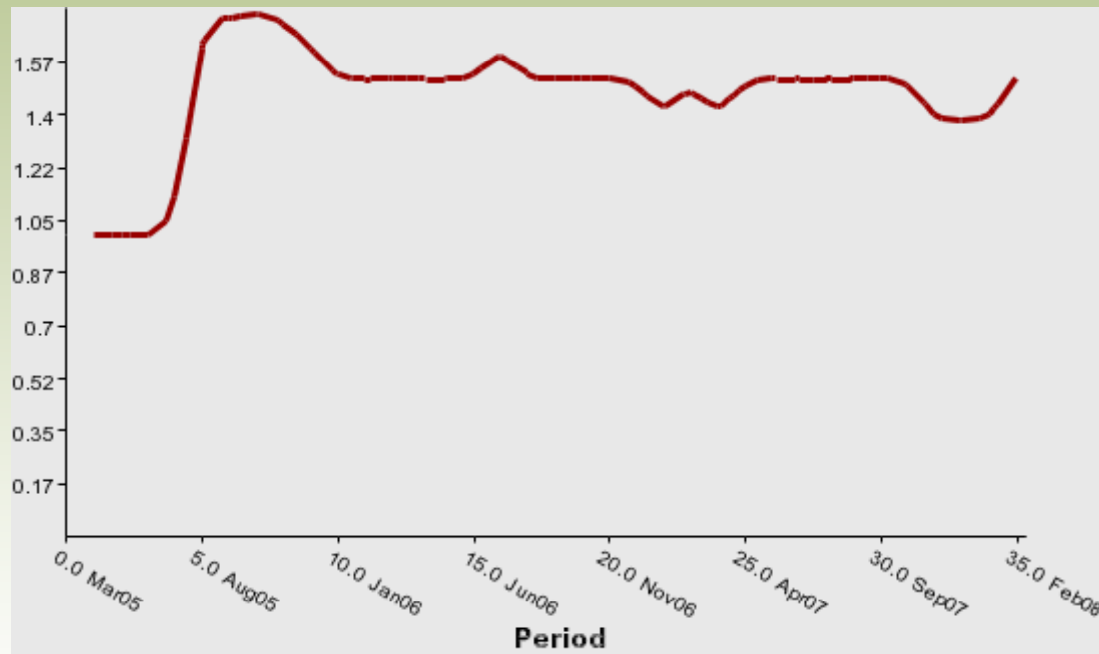
Cumulative Prepayments



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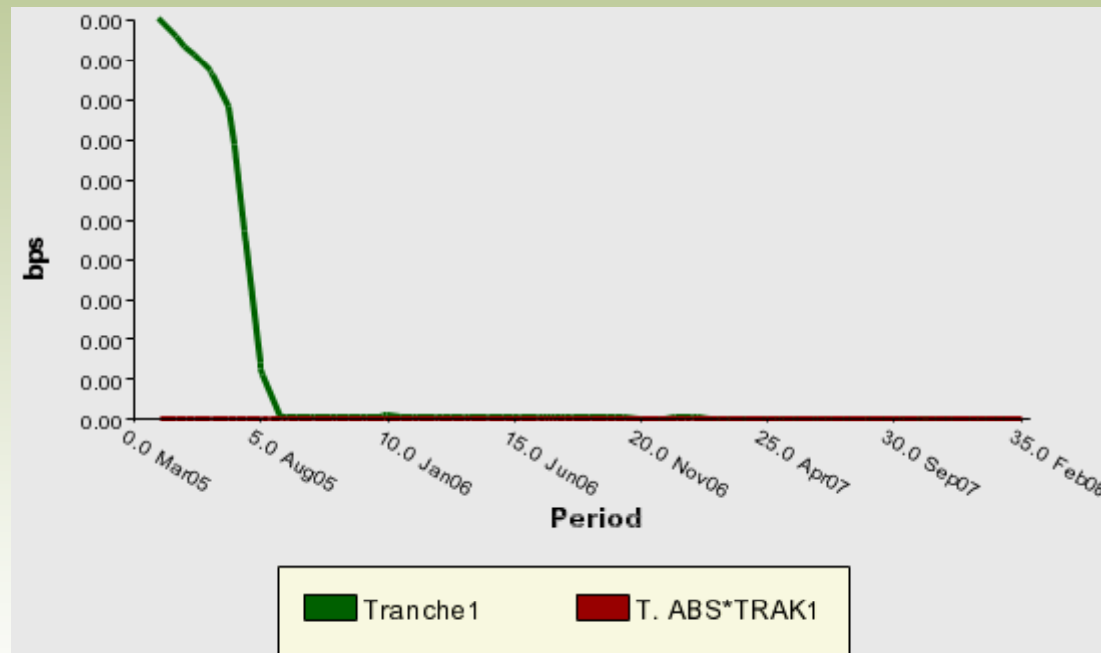
Prepay Multiplier



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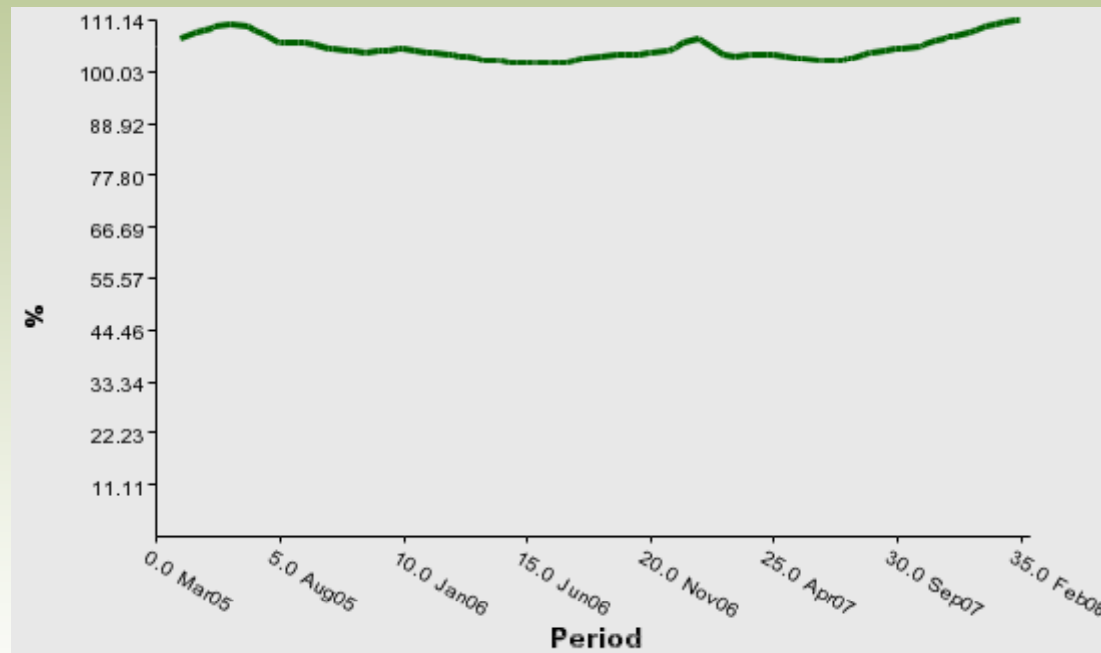
A-1 ABS*TRAK



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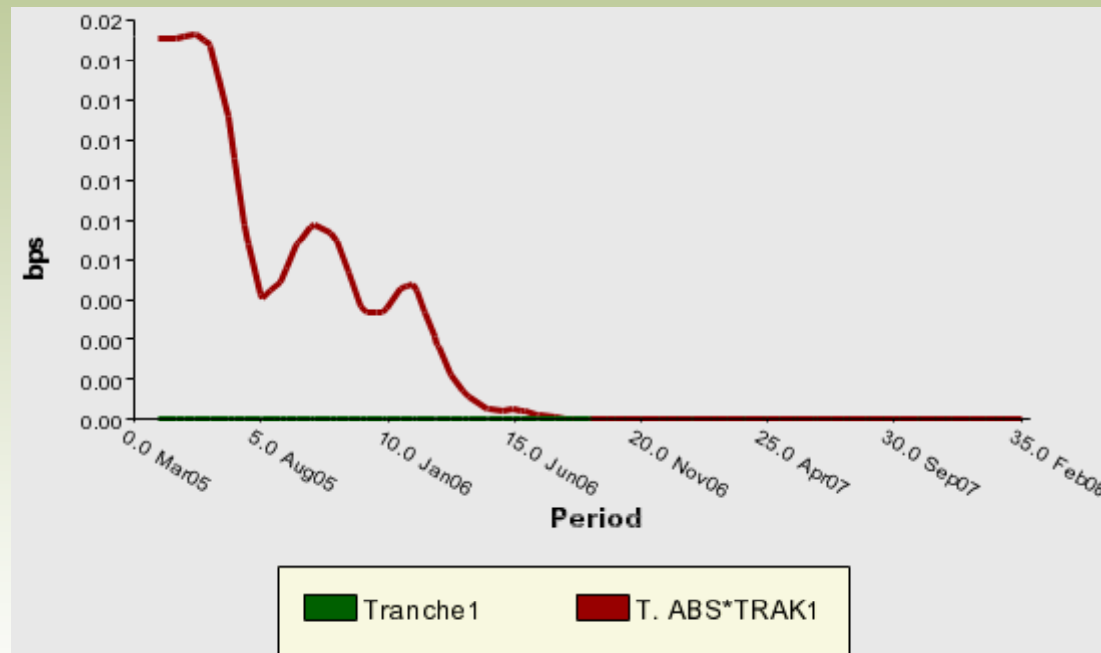
A-1 Fair Market Value



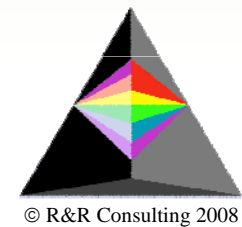
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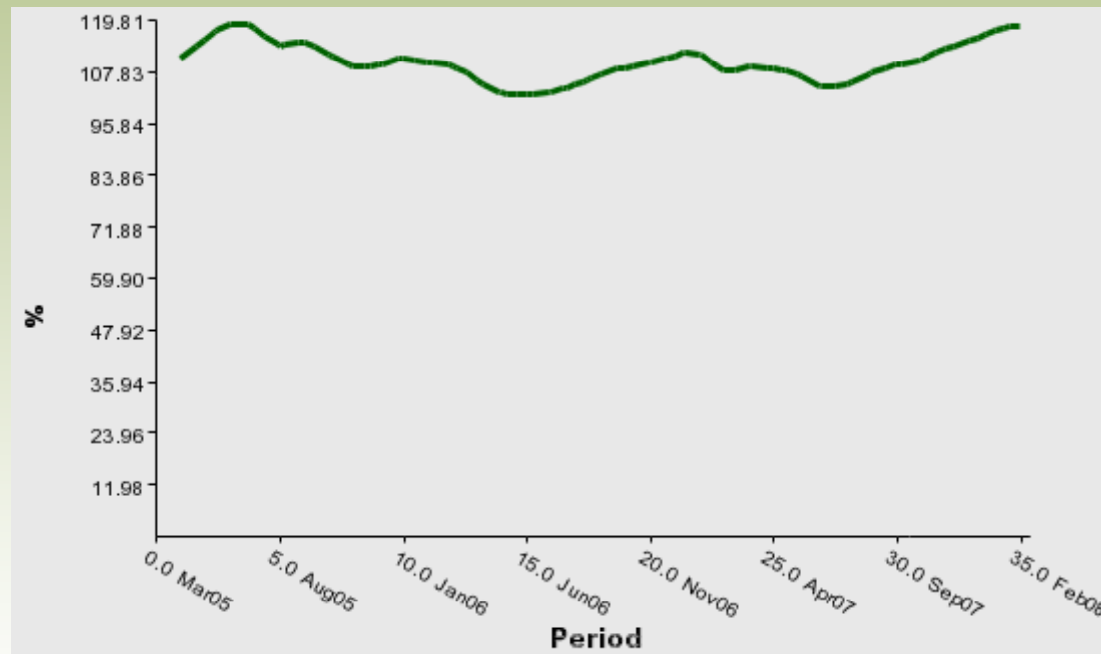
A-2 ABS*TRAK



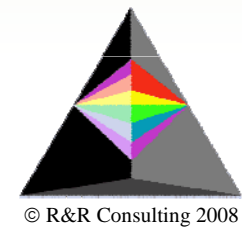
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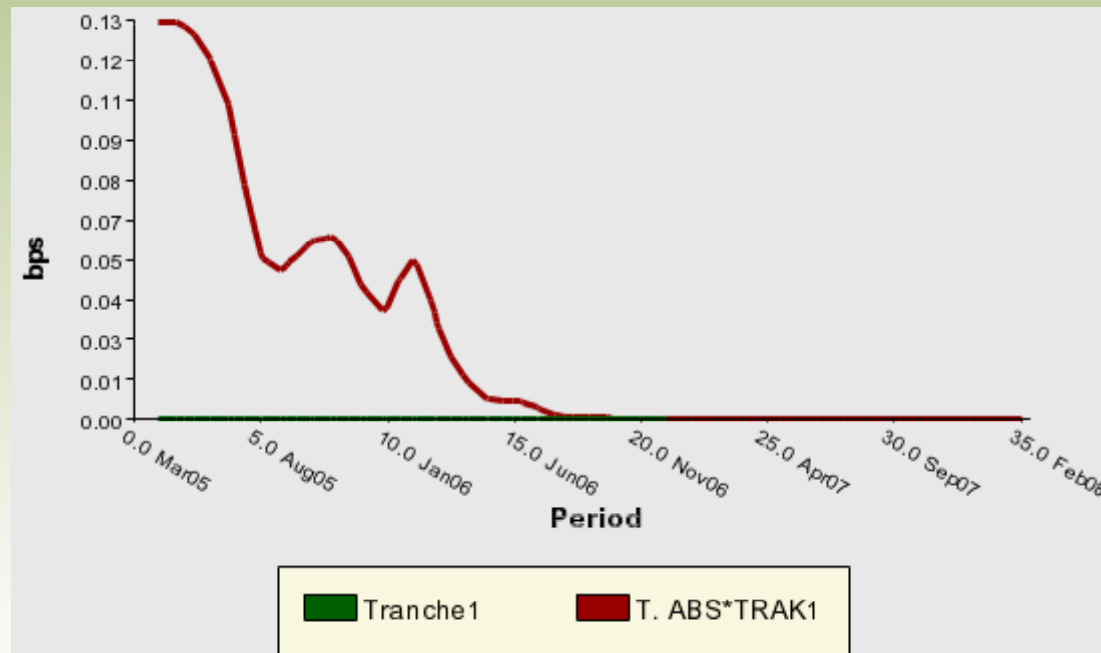
A-2 Fair Market Value



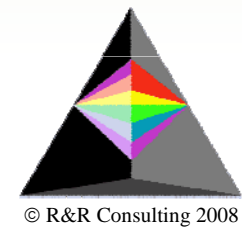
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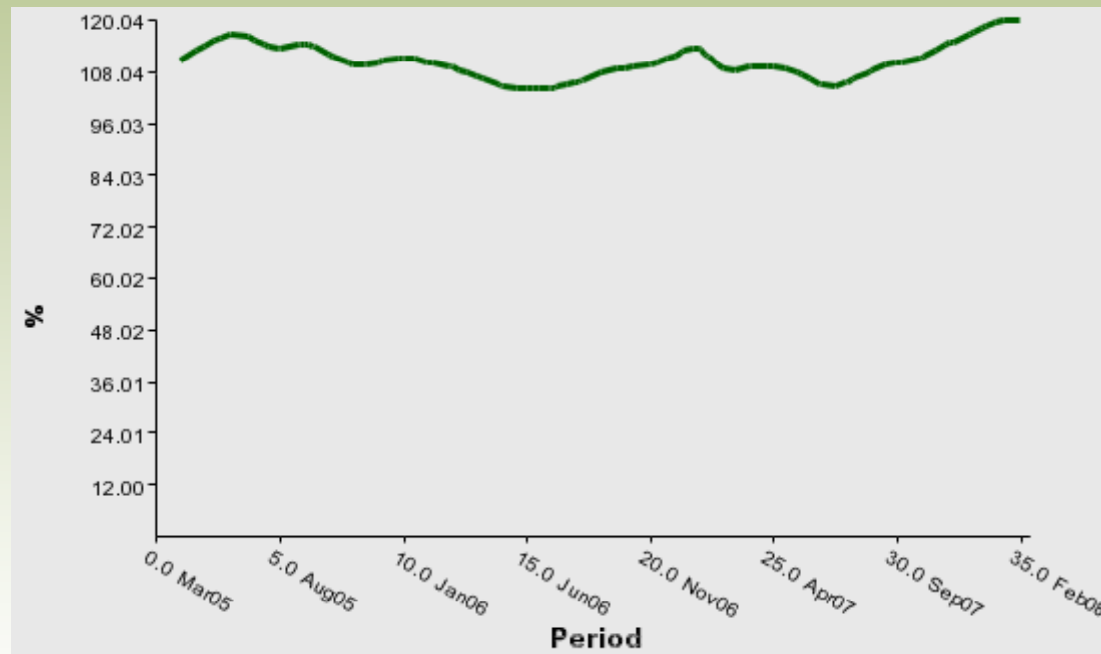
A-3 ABS*TRAK



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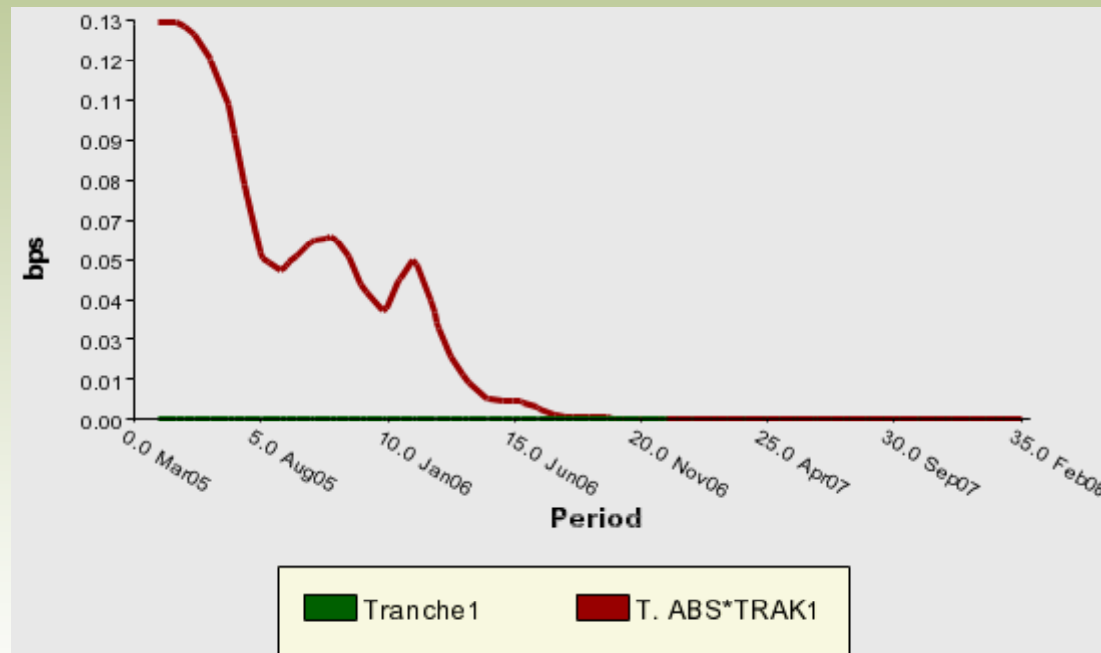
A-3 Fair Market Value



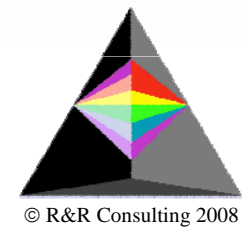
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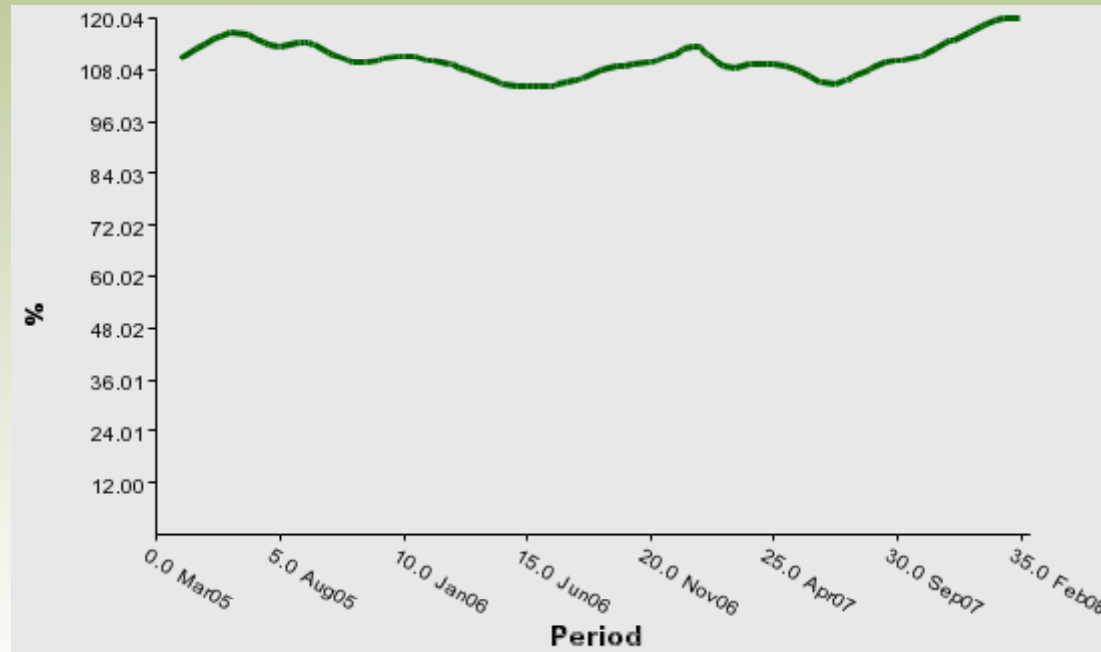
A-4 ABS*TRAK



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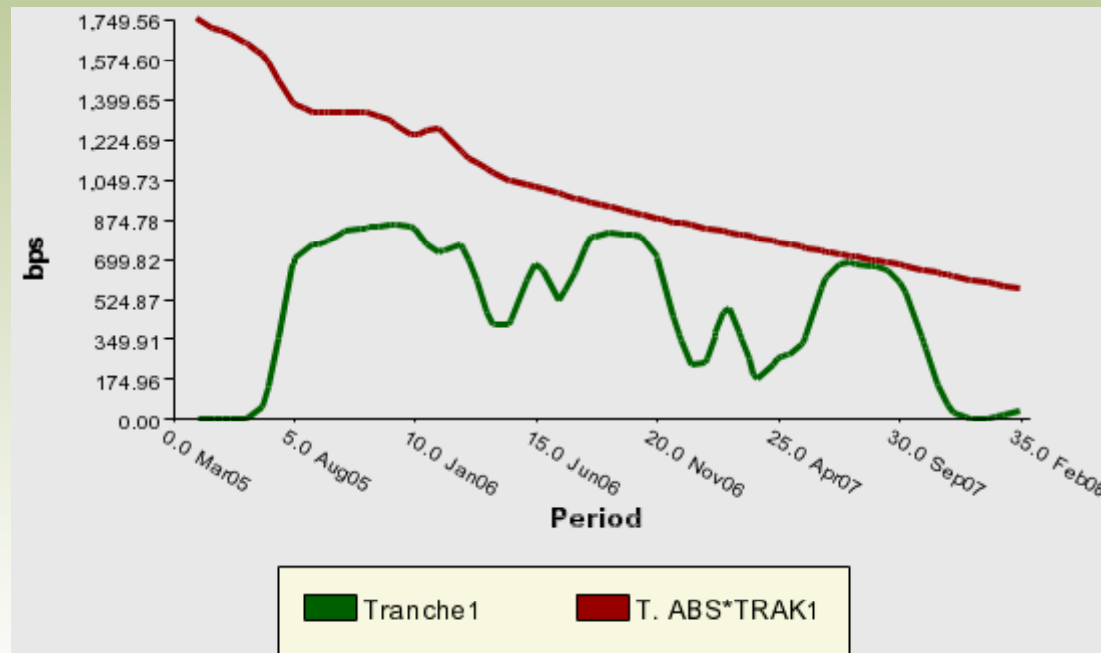
A-4 Fair Market Value



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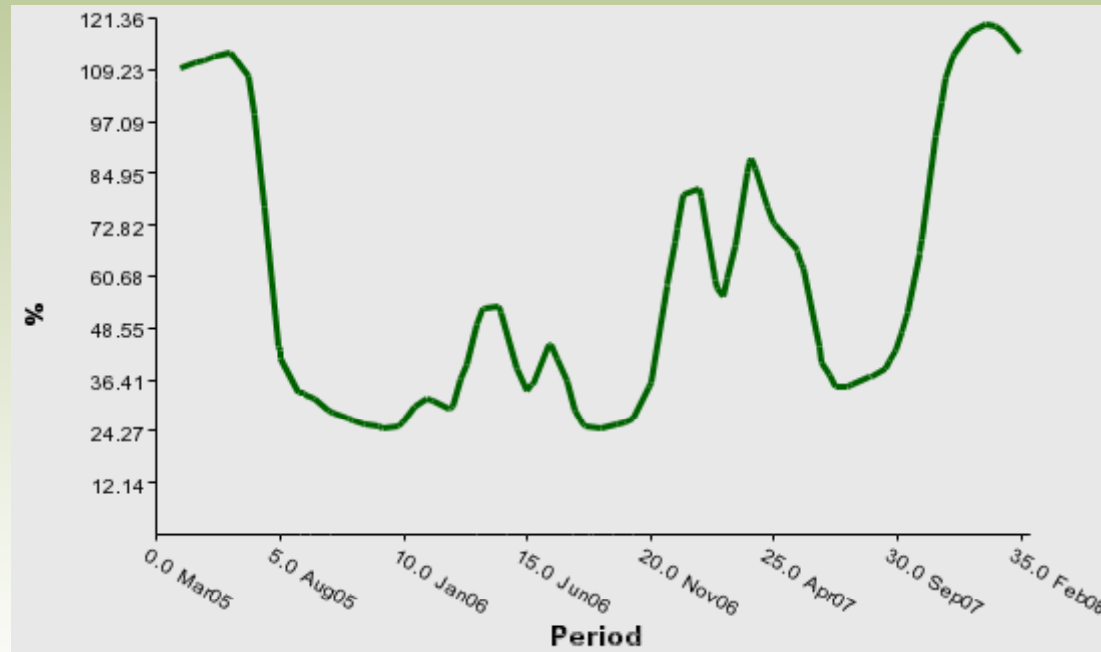
M ABS*TRAK



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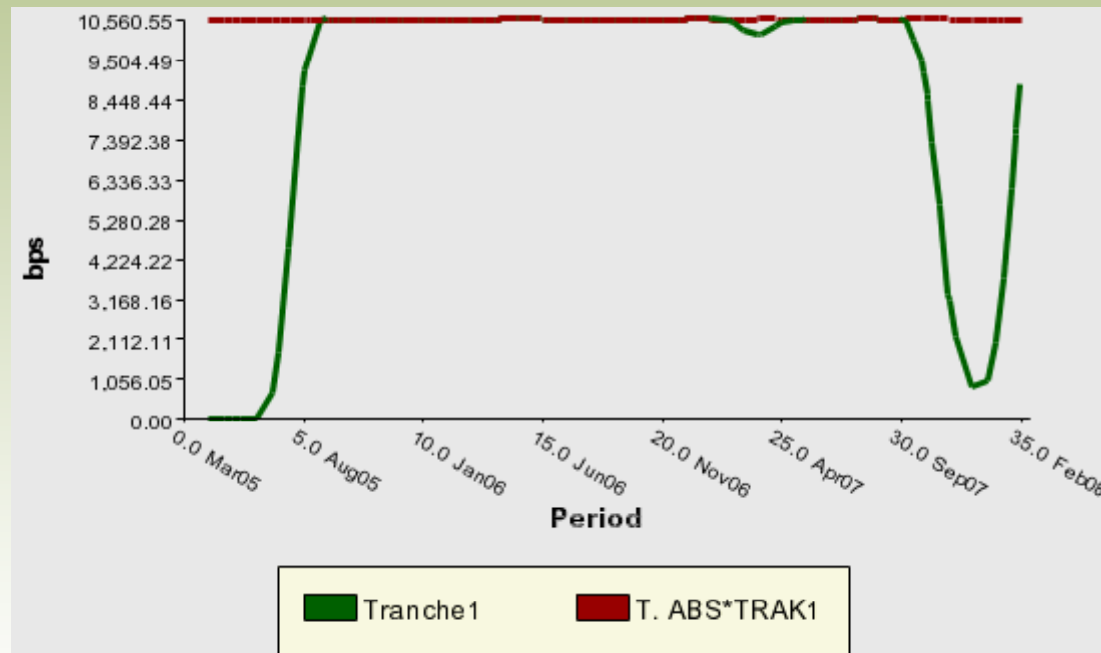
M Fair Market Value



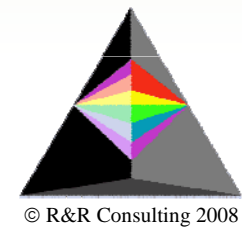
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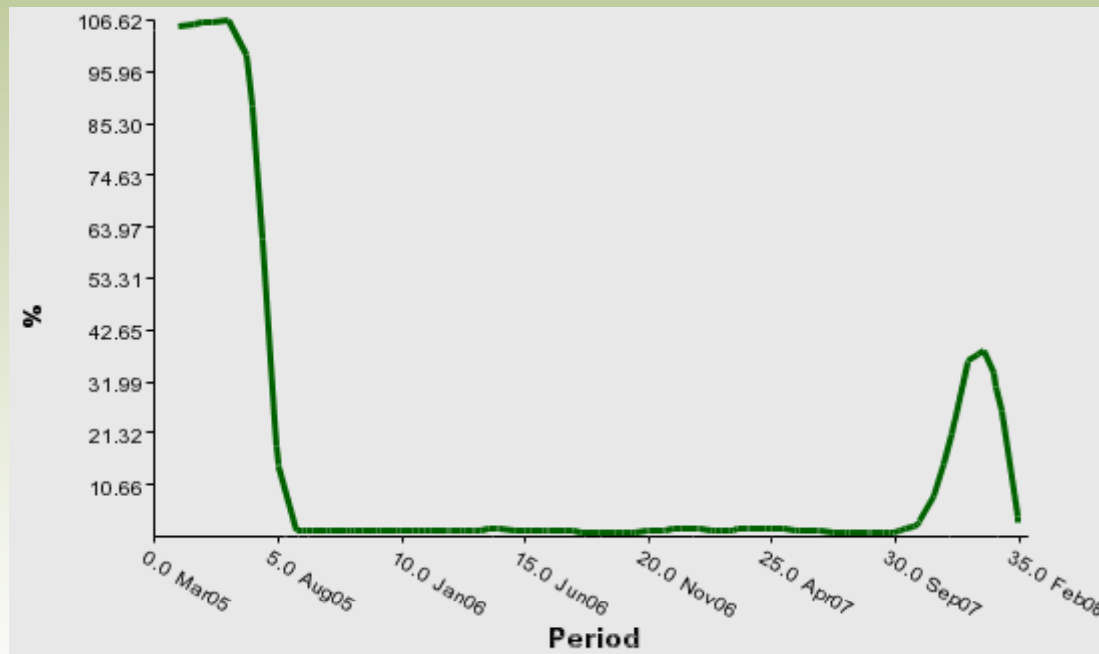
B-1 ABS*TRAK



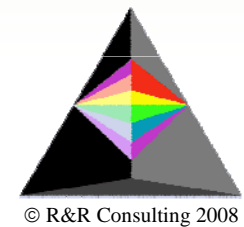
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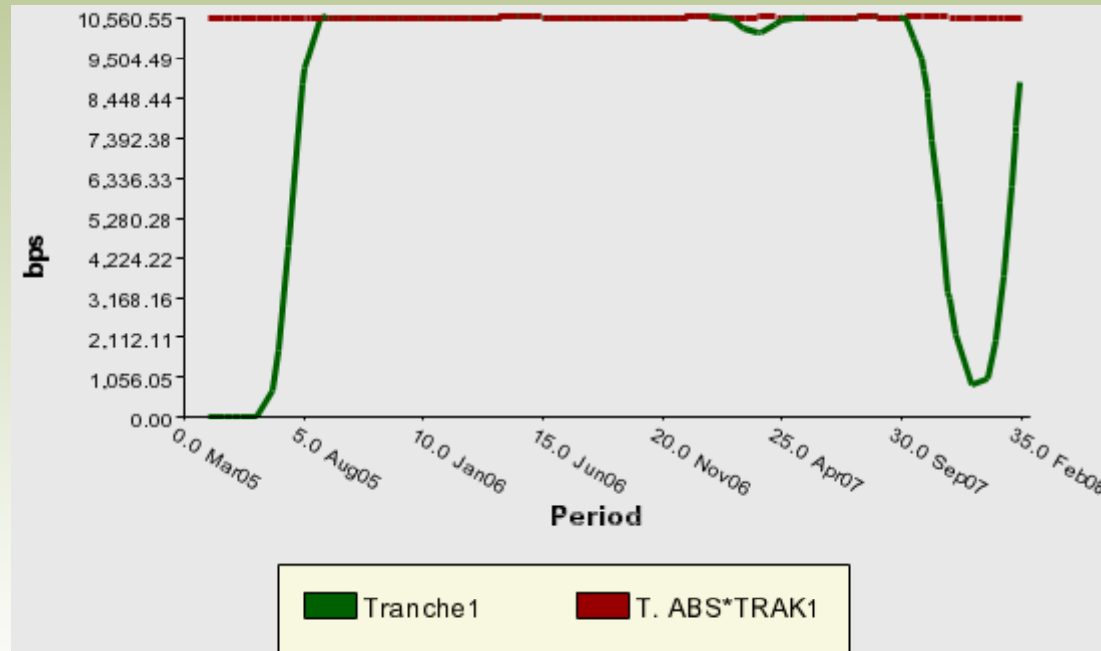
B-1 Fair Market Value



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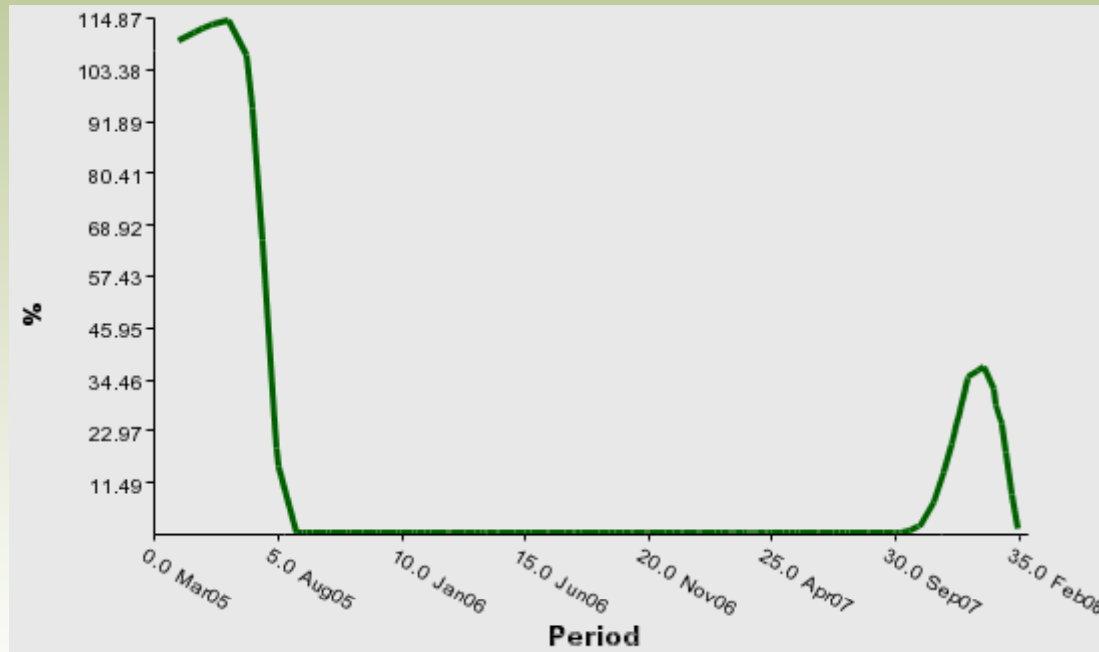
B-2 ABS*TRAK



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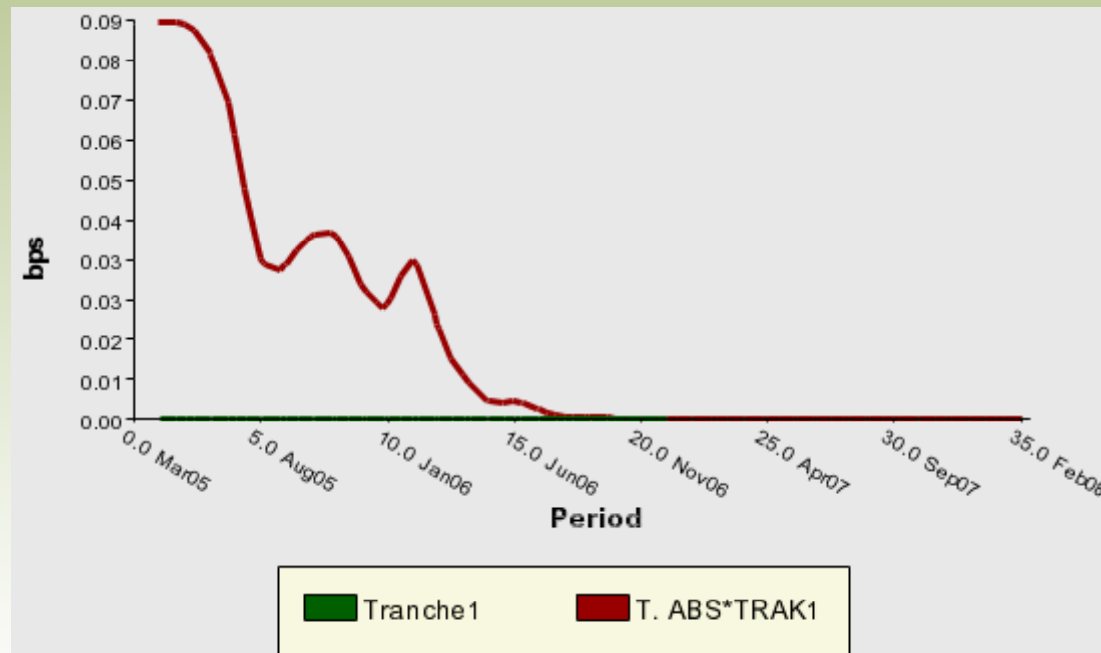
B-2 Fair Market Value



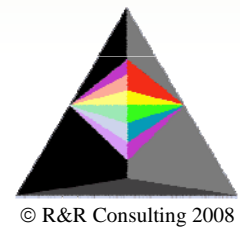
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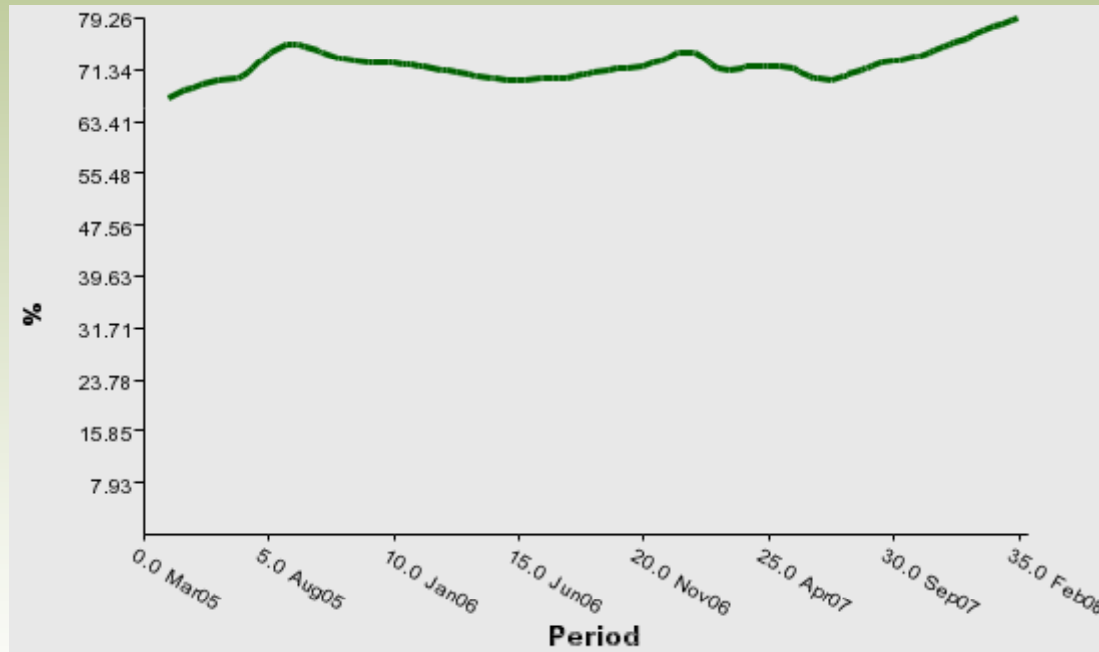
PO ABS*TRAK



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PO Fair Market Value



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