



RMBS Transparency Through Enhanced Loan-Level Data

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Topics

RMBS Loan-Level Analysis Workshop

- **Overview of differing levels of sophistication**
 - Current approaches in the market place
- **Case study – analyzing a prime adjustable RMBS transaction**
 - Four valuation frameworks
 - Comparison of results
- **Additional data sets to consider**

Differing Levels of Sophistication

RMBS Analysis

- **Deal level**
 - Historical trends, rolling delinquencies
- **Loan level**
 - Focus on troubled loans
 - Predictive analysis
- **Loan level with enhanced data**
 - Sophisticated property analysis
 - Updated borrower credit analysis

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Deal Level Analysis

RMBS Analysis

- **Practiced less frequently**
- **Limited insight into collateral**
- **Limited predictive ability**
- **Available via:**
 - Trustee reports
 - Major RMBS platforms

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Deal-Level Information – The Starting Point

GSR Mortgage Loan Trust 2006-AR1

- **Prime jumbo residential mortgage loan pool**
- **Closing date – January 30, 2006**
- **Deal original balance – \$1,350,386,698**
- **Underwriter – Goldman, Sachs & Co. (primary)**
- **Trustee – Wells Fargo Bank, N.A.**
- **Current information**
 - Deal current balance – \$693,274,163
 - 4.22% of the current pool is 180+ days delinquent or bankrupt and has not been foreclosed upon¹
 - 2.81% transaction cumulative losses to-date²

1. Source: Standard & Poor's Global Data Solutions U.S. RMBS Edition as of December 27, 2010.

2. Source: Wells Fargo Trustee Report on GS Mortgage Securities Corp. Mortgage Pass-Through Certificates Series 2006-AR1 as of December 27, 2010.

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Sample Collateral Statistics

GSR Mortgage Loan Trust 2006-AR1

Current Delinquency Status as per Trustee Report (MBA Method)¹

30 Days delinquent	2.81%
60 Days delinquent	1.45%
90 Days delinquent	1.04%
120-180 Days delinquent	4.75%
Foreclosure	7.62%
REO (Real-Estate Owned)	2.09%
Bankrupt	1.00%

Loss Severity¹

Current Month (cumulative)	40.18%
3 Month Average (cumulative)	40.10%
12 Month Average (cumulative)	39.80%

CDR¹

Current Month	3.47%
3 Month Average	5.57%
12 Month Average	5.33%

CPR¹

Current Month	9.45%
3 Month Average	14.81%
12 Month Average	15.54%

Purpose of Mortgage Loans²

Purchase	54.63%
Rate Term Refinance	23.02%
Cash Out Refinance	22.35%

Credit Score Distribution of the Mortgage Loans²

600-649	1.09%
650-699	19.45%
700-749	34.85%
750-799	40.19%
800-849	4.11%

Original Principal Balances²

\$350-500K	26.62%
\$500-650K	33.98%
\$650-800K	14.26%
\$800-950K	8.13%
\$950-\$1.1M	7.15%
\$1.1M and above	9.87%

1. Source: Wells Fargo Trustee Report on GS Mortgage Securities Corp. Mortgage Pass-Through Certificates Series 2006-AR1 as of December 27, 2010.

2. Source: Deal Prospectus Supplement for GS Mortgage Securities Corp. Mortgage Pass-Through Certificates Series 2006-AR1

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Loan Level Analysis

RMBS Analysis

- **Increasingly common**
- **Can be either labor or system intensive**
 - Large amounts of data
- **Facilitates custom analysis of collateral**
- **Utilization of credit models**
- **Available via:**
 - Servicer websites
 - 3rd party sources

Sample Collateral Statistics

GSR Mortgage Loan Trust 2006-AR1

Current Delinquency Status (MBA Method)¹

30 Days delinquent	2.81%
60 Days delinquent	1.45%
90 Days delinquent	1.16%
120-180 Days delinquent	5.62%
Foreclosure	7.62%
REO (Real-Estate Owned)	2.09%

Property Type

Single-family residence	66.0%
Planned unit development (PUD)	20.5%
Condominium	11.9%
Two-family residence	1.6%

State

CA	49.2%
VA	7.2%
IL	5.0%
FL	4.0%
AZ	4.0%

Occupancy Status

Owner occupied	91.8%
Second home	7.1%
Investor owned	1.1%

Loan Purpose

Purchase	53.5%
Cash-out refinance	23.4%
Rate/Term refinance	23.1%

Loan Type

5/1 or 5/6 mos. ARM	82.7%
7/1 or 7/6 mos. ARM	9.3%
3/1 or 3/6 mos. ARM	8.0%

Documentation Type

24 Months or more income verification and employment verification	50.0%
11 Months or less income verification and employment verification	20.9%
12 to 23 Months' income verification and employment verification	13.9%
Verbal verification of employment (VVOE)	12.7%
No employment/income verification (or unknown)	2.5%

Source: Standard & Poor's Global Data Solutions U.S. RMBS Edition as of December 27, 2010.

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Loan-Level Property Analysis

Loan-to-Value Ratios

- **Amortized LTV** – based upon current loan balance and original property appraisal
- **Index-Adjusted HPI LTV** – based upon current loan balance and original property appraisal, adjusted via home price index (HPI) at the CBSA¹ level, to approximate current property value
 - Challenges include mapping each zip code to just one CBSA
 - Identifying appropriateness of index
 - Potential sources include:
 - S&P/Case-Shiller[®] Home Price Index
 - FHFA² (formerly OFHEO³)
 - 3rd party sources

¹CBSA = Core-based Statistical Area

²FHFA = Federal Housing Finance Agency

³OFHEO = Office of Federal Housing Enterprise Oversight

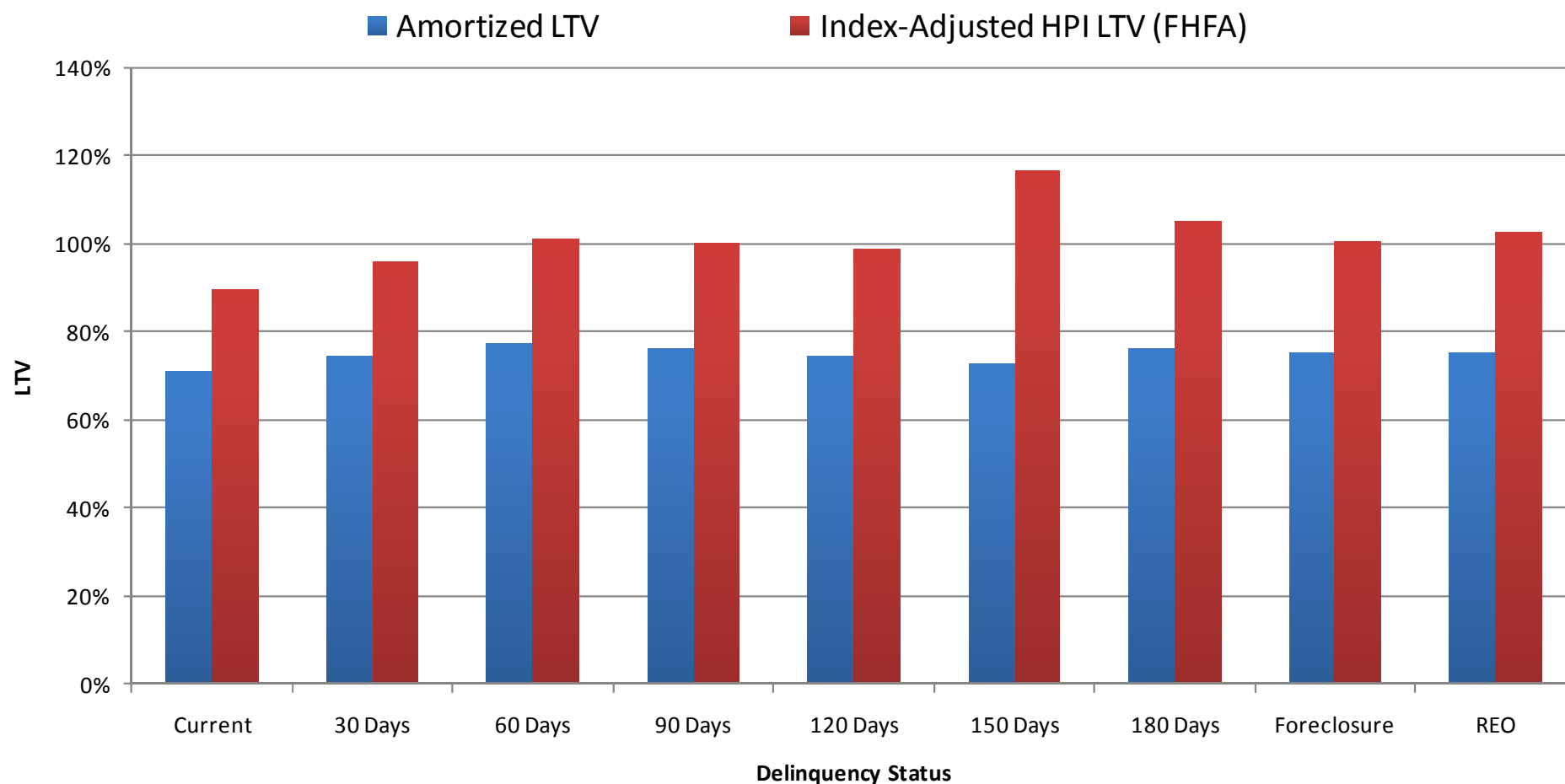
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Loan-Level Property Analysis

Loan-to-Value Ratios

- Adjusting LTV via an index starts to distinguish problem mortgages

Loan-to-Value (LTV) by Home Valuation Type



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Loan-Level Borrower Analysis

Assessing Credit Quality

- **Credit Score – Typically FICO of borrower at origination**
- **Debt-to-Income ratio – Typically ‘front-end’ DTI at origination**
 - ‘Front-end’ DTI combines mortgage debt and housing related payments with borrower reported income at origination
- **Updated metrics difficult to attain through public sources**

Loan Level Analysis with Enhanced Data

RMBS Analysis

- **Desired by more investors and structured product analysts**
- **Requires confidence in data sets**
 - Decisions increasingly reliant on this data
- **Can allow for greater predictive capacity**
- **Available via:**
 - Internal models
 - 3rd party sources

Loan-Level Property Analysis

Loan-to-Value Ratios

- **Update property values through**
 - BPO – Broker Price Opinion
 - AVM – Automated Valuation Model
 - Index, Hedonic, Hybrid
- **AVM LTV – based upon current loan balance and AVM property appraisal, to approximate current property value**
 - Identifying confidence of valuation
 - Potential sources include:
 - 3rd party sources – e.g. Veros
 - Internal Models
- **Discovery of second liens and HELOCs¹**

¹HELOC = Home Equity Line of Credit.

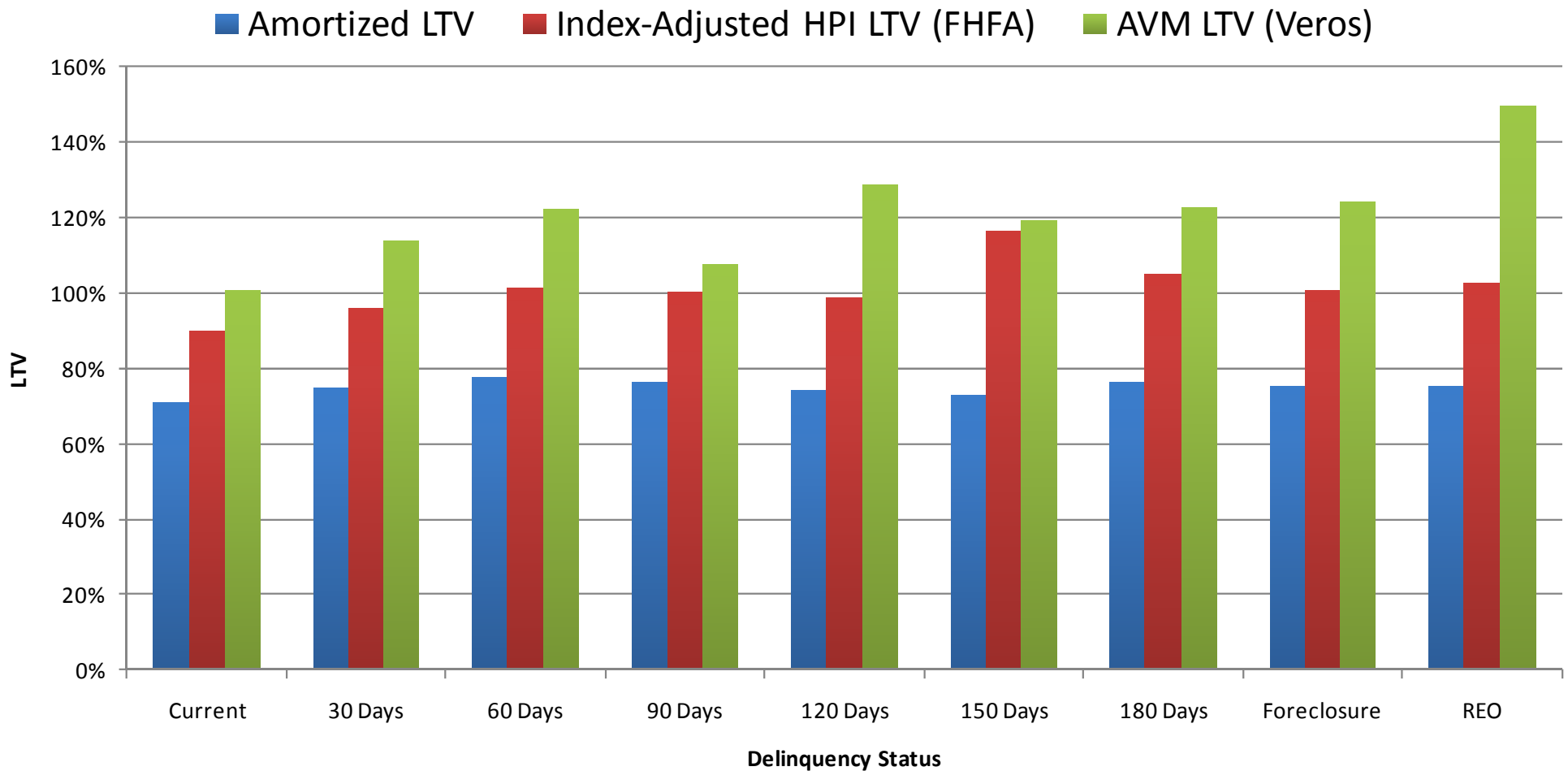
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Loan-Level Property Analysis

Loan-to-Value Ratios

- Adjusting LTV via an AVM further separates problem mortgages

Loan-to-Value (LTV) by Home Valuation Type

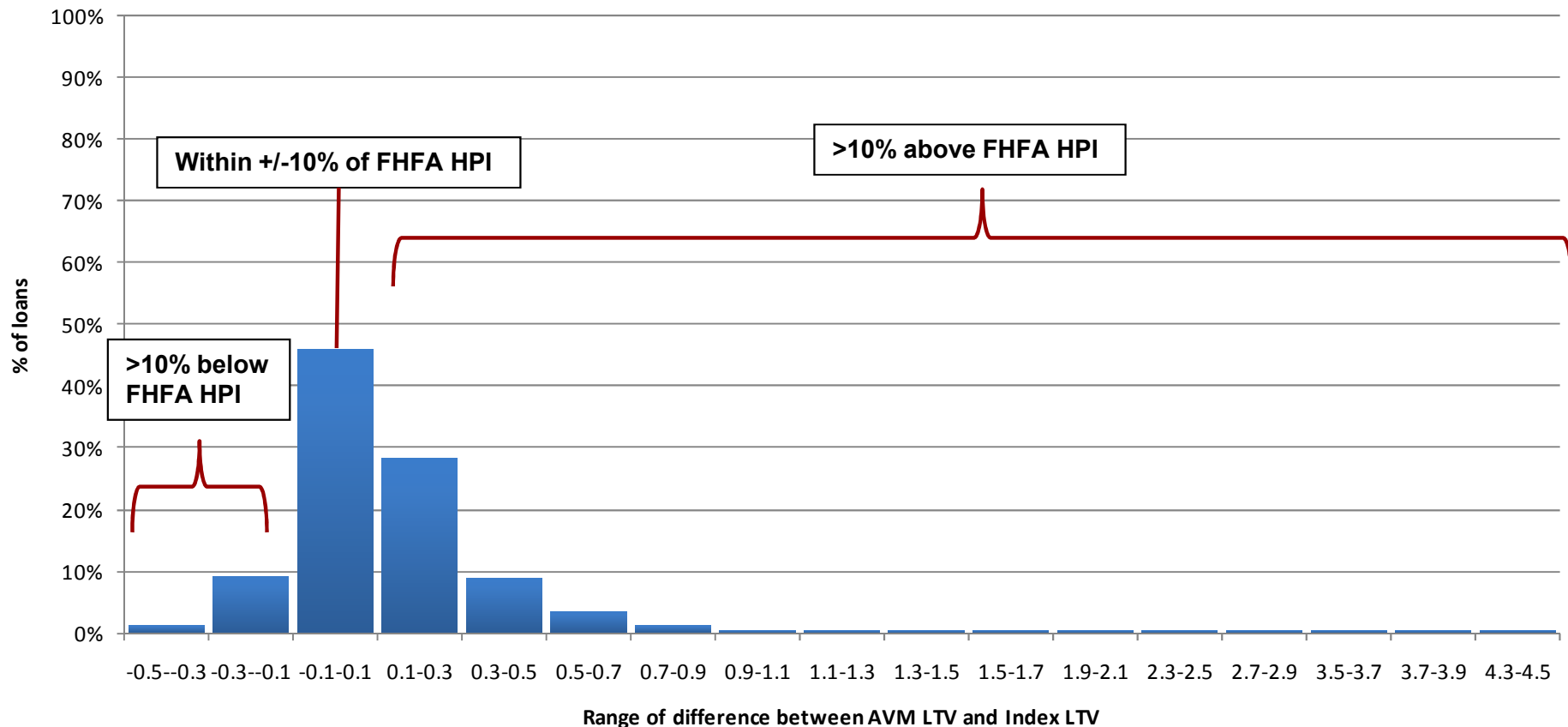


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Changing Property Profile Overview

GSR Mortgage Loan Trust 2006-AR1

Distribution of Difference Between AVM LTVs and Index HPI LTVs



- **Although 46% of LTVs derived from AVMs are within 10% of the LTV derived from the FHFA House Price Index 54% are either below or above that level**
 - **10%** of LTVs derived from AVMs are >10% below the LTV derived from the FHFA House Price Index
 - **44%** of LTVs derived from AVMs are >10% above the LTV derived from the FHFA House Price Index

Source: Veros data as of Q2 2010, Standard & Poor's analysis as of December 2010.

FHFA = Federal Housing Finance Agency. AVM = Automated Valuation Model. HPI = House Price Index.

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Loan-Level Borrower Analysis

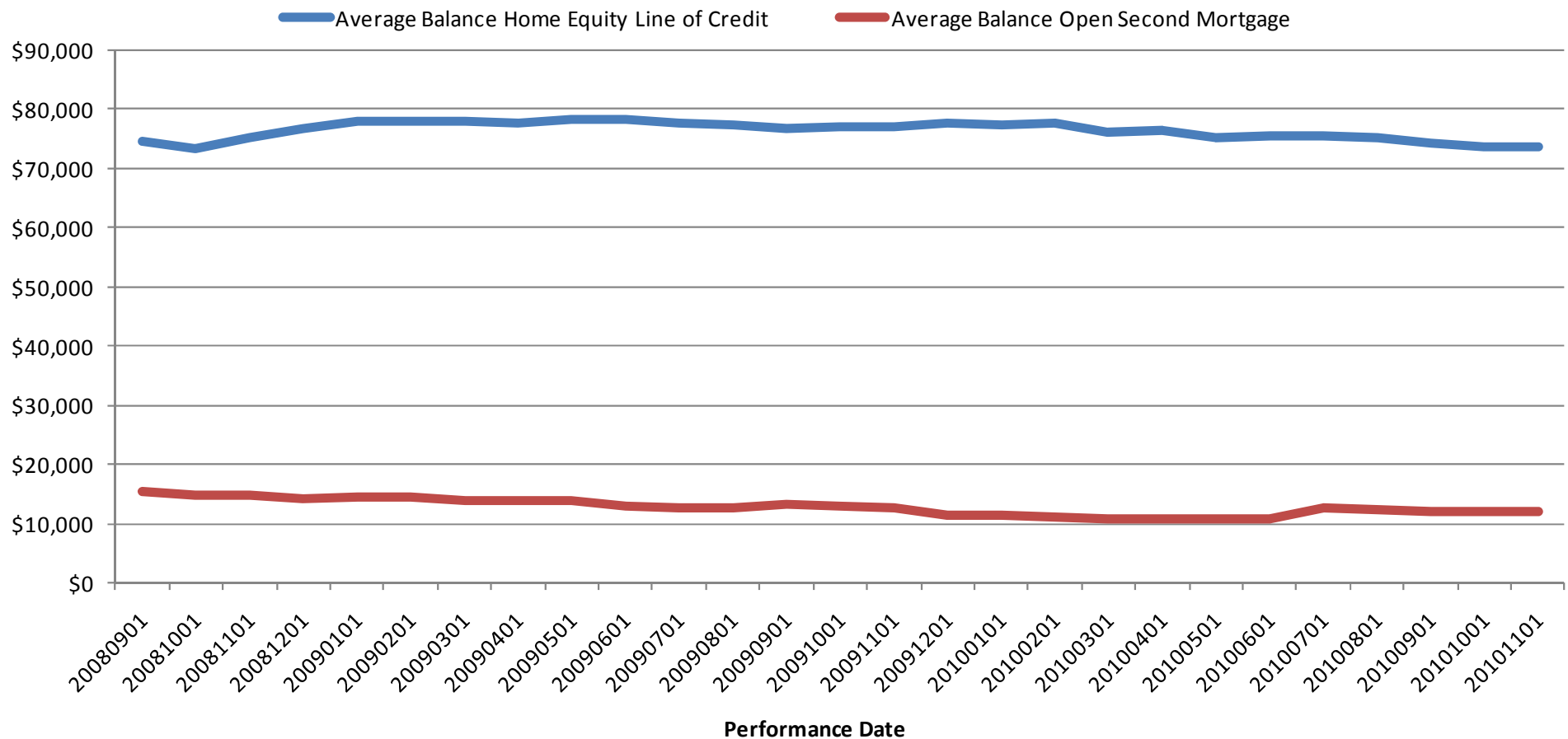
Assessing Credit Quality

- **Credit Score – Updated to reflect current credit performance**
- **Debt-to-Income ratio – Can reflect ‘back-end’ DTI**
 - ‘Back-end’ DTI combines mortgage debt and housing related payments and all other debt payments with modeled borrower income
- **Access to other debts, payment performance and utilization rates**

Second Liens Declining Slightly But, Drawn Home Equity Balance Remains Elevated

GSR Mortgage Loan Trust 2006-AR1

Average Second Mortgage Balance and Home Equity Lines Drawn



Source: Standard & Poor's analysis as of December 2010 and Experian credit information as of November 2010.

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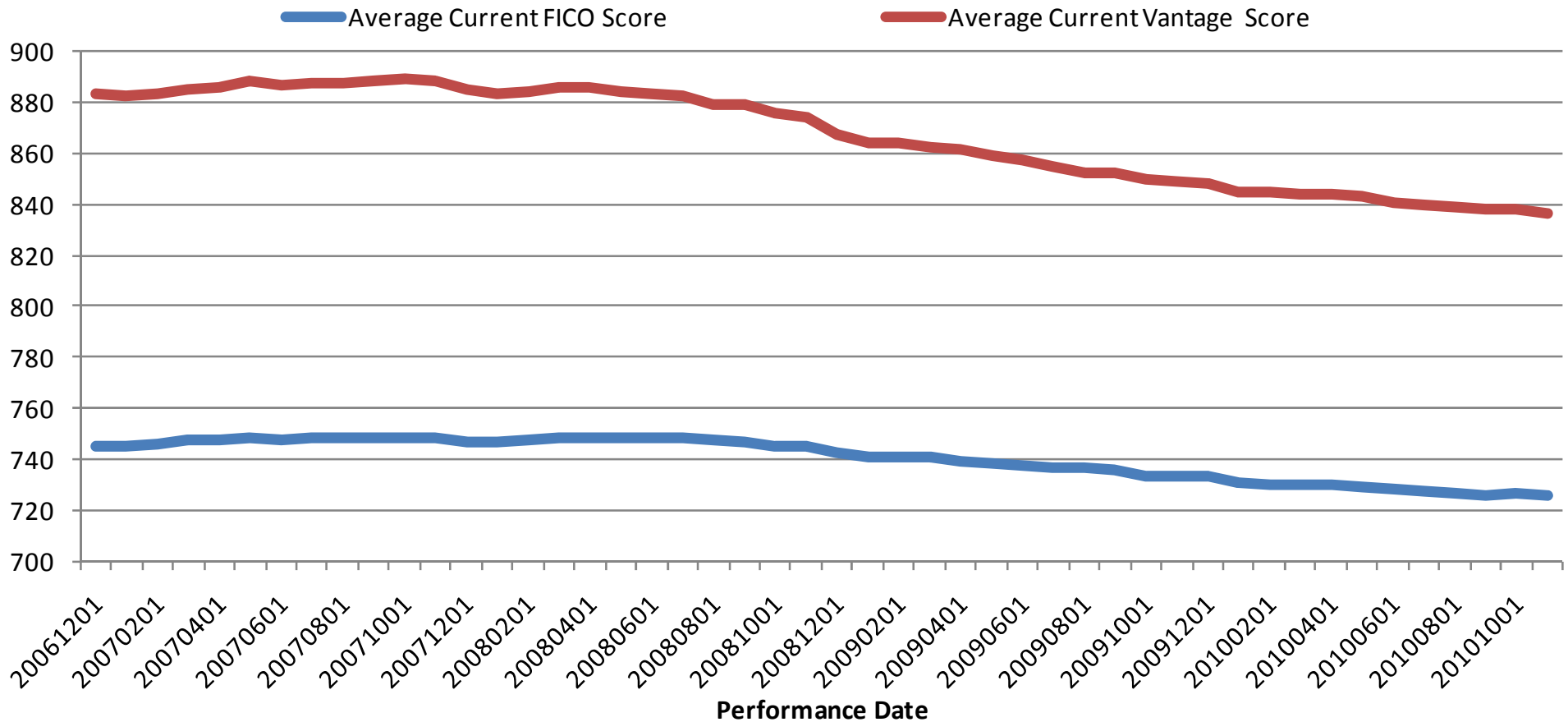
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Credit Scores Declining

Capturing Shifting Borrower Risk

GSR Mortgage Loan Trust 2006-AR1

Credit Score Migrations



Source: Standard & Poor's analysis as of December 2010 and Experian credit information as of November 2010.

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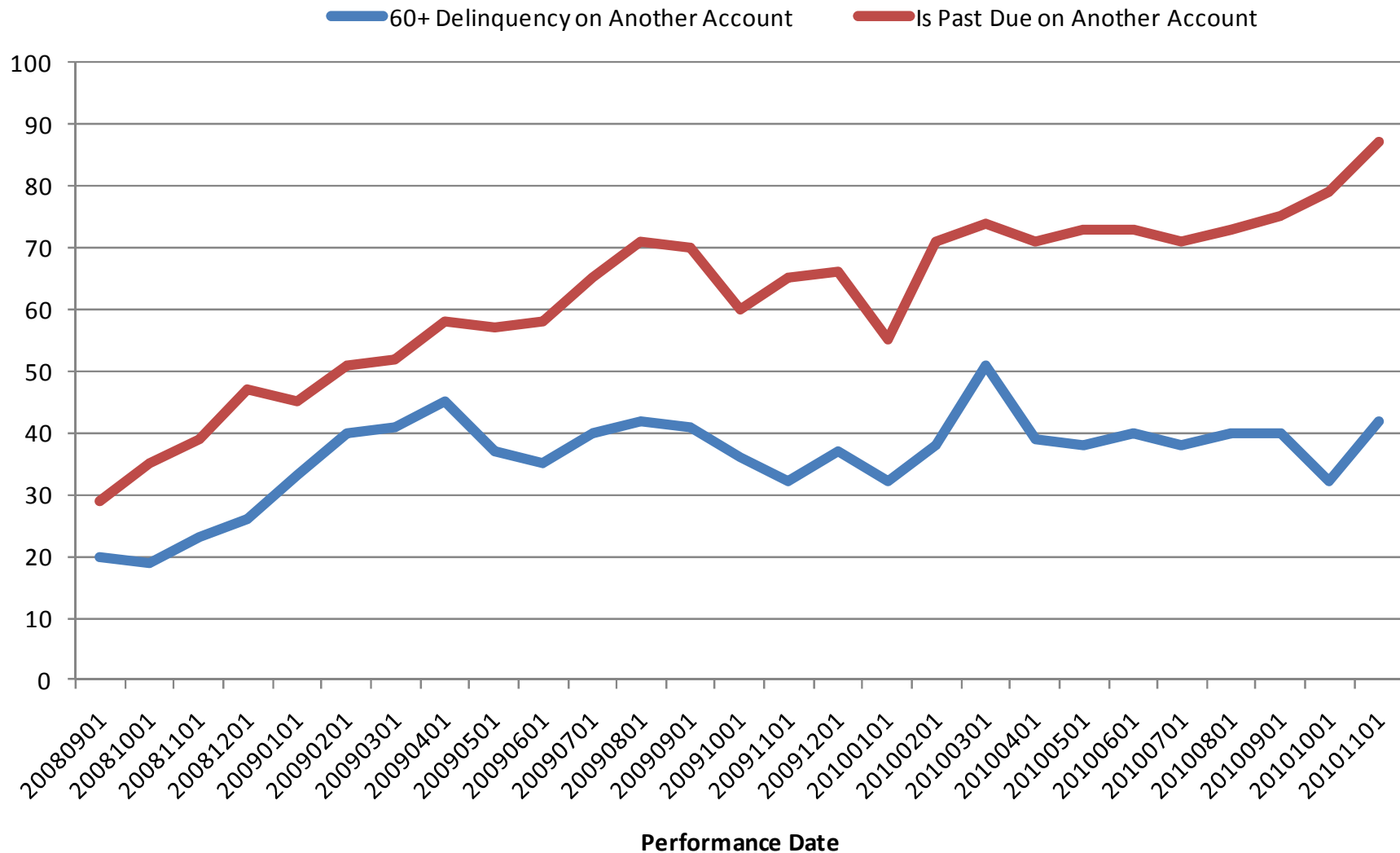
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On Average, Number Of Accounts Past Due Still Rising

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Number of Borrowers with Credit Concerns



Source: Standard & Poor's analysis as of December 2010 and Experian credit information as of November 2010.

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Case Study – Four Valuation Frameworks

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Increasing Levels Of Valuation Sophistication

1. **Deal-level analysis based upon aggregate statistics**
2. **Loan-level analysis based upon house price indices applied at the CBSA level**
3. **Loan-level analysis based upon updated property-specific information**
4. **Loan-level analysis based upon updated property-specific information and updated borrower information**

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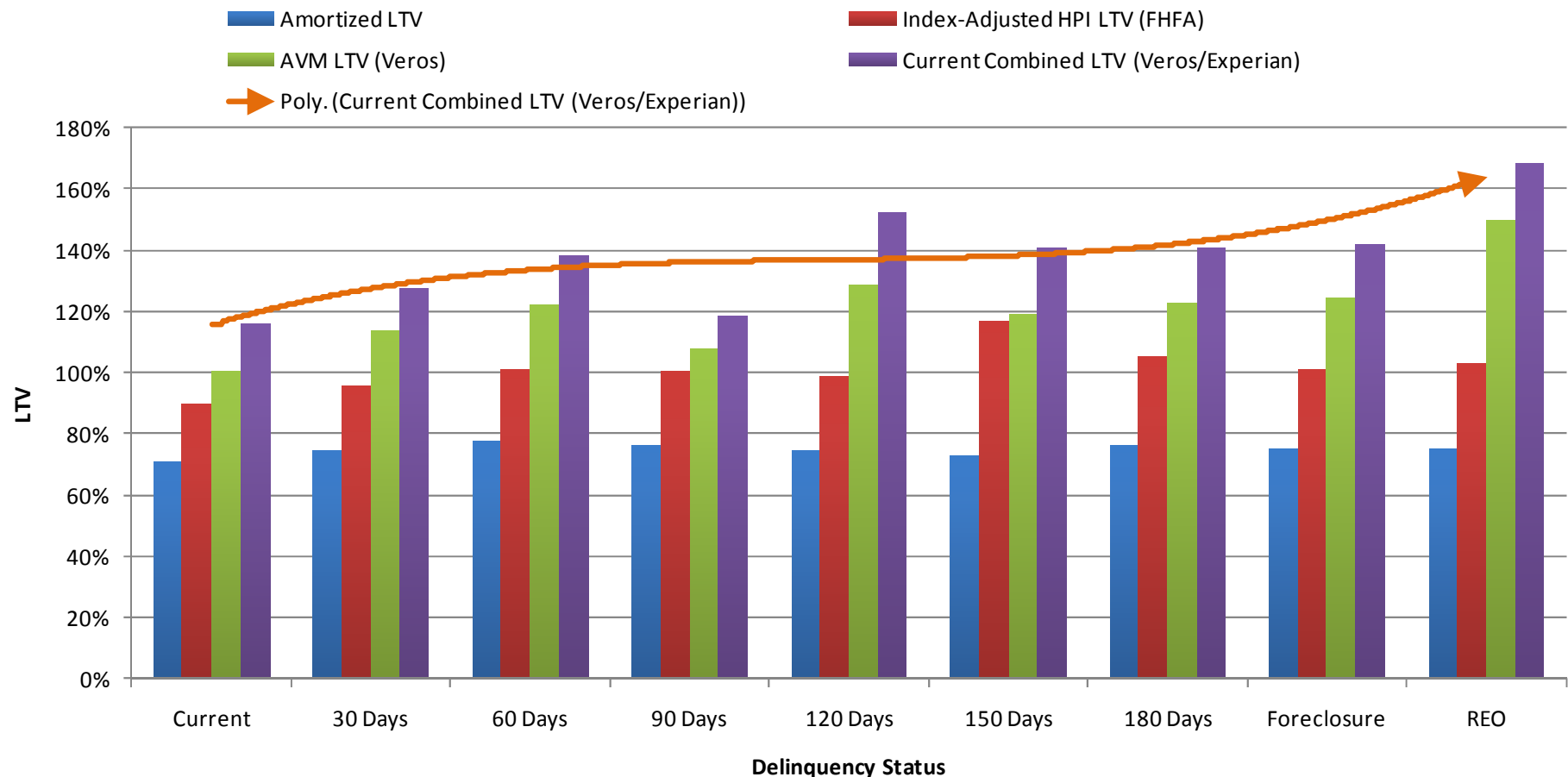
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LTVs As A Potential Indicator Of Performance

GSR Mortgage Loan Trust 2006-AR1

- Delinquency status is related to LTV, and we believe combining property and consumer data shows the most complete picture

Loan-to-Value (LTV) by Home Valuation Type

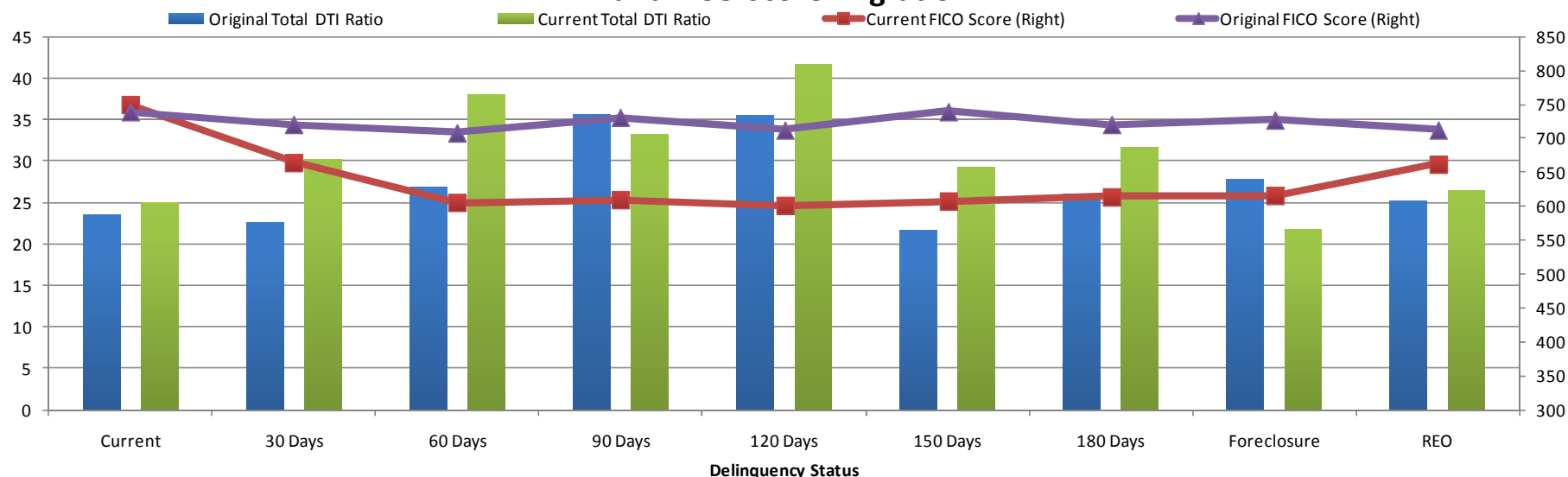


Source: Veros data as of Q2 2010, Standard & Poor's analysis as of December 2010.

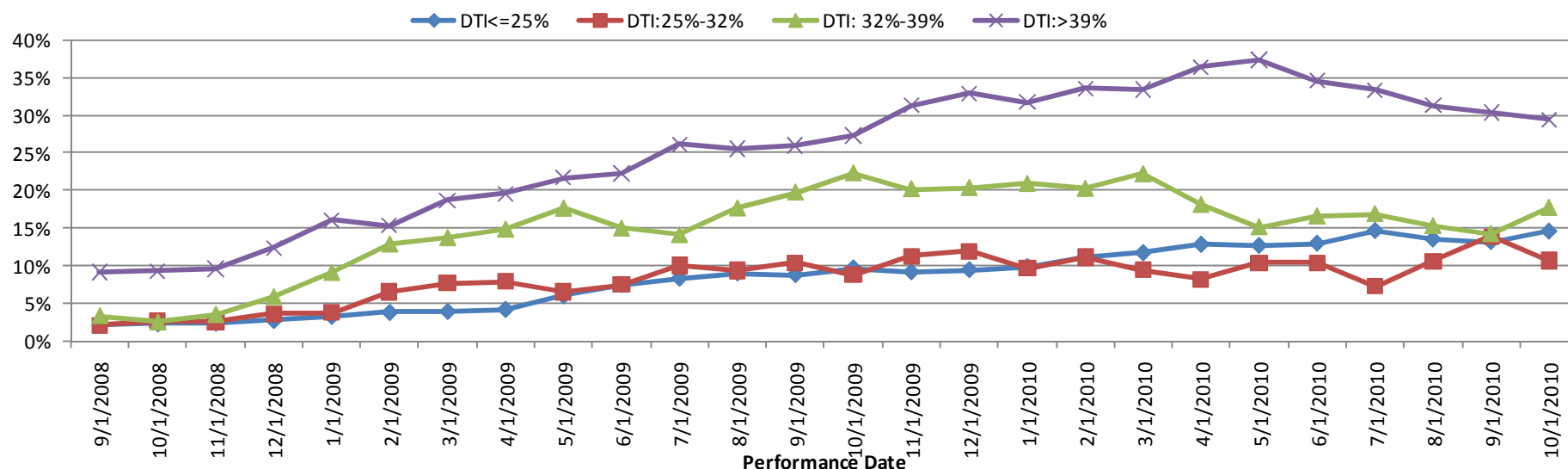
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Performance Differs Significantly By DTI Buckets

Debt-to-Income Ratio by Delinquency Status and FICO Score Migration



60+ Delinquency Status by DTI Range



Source: Standard & Poor's analysis as of December 2010 and Experian credit information as of November 2010.
DTI = Debt to income.

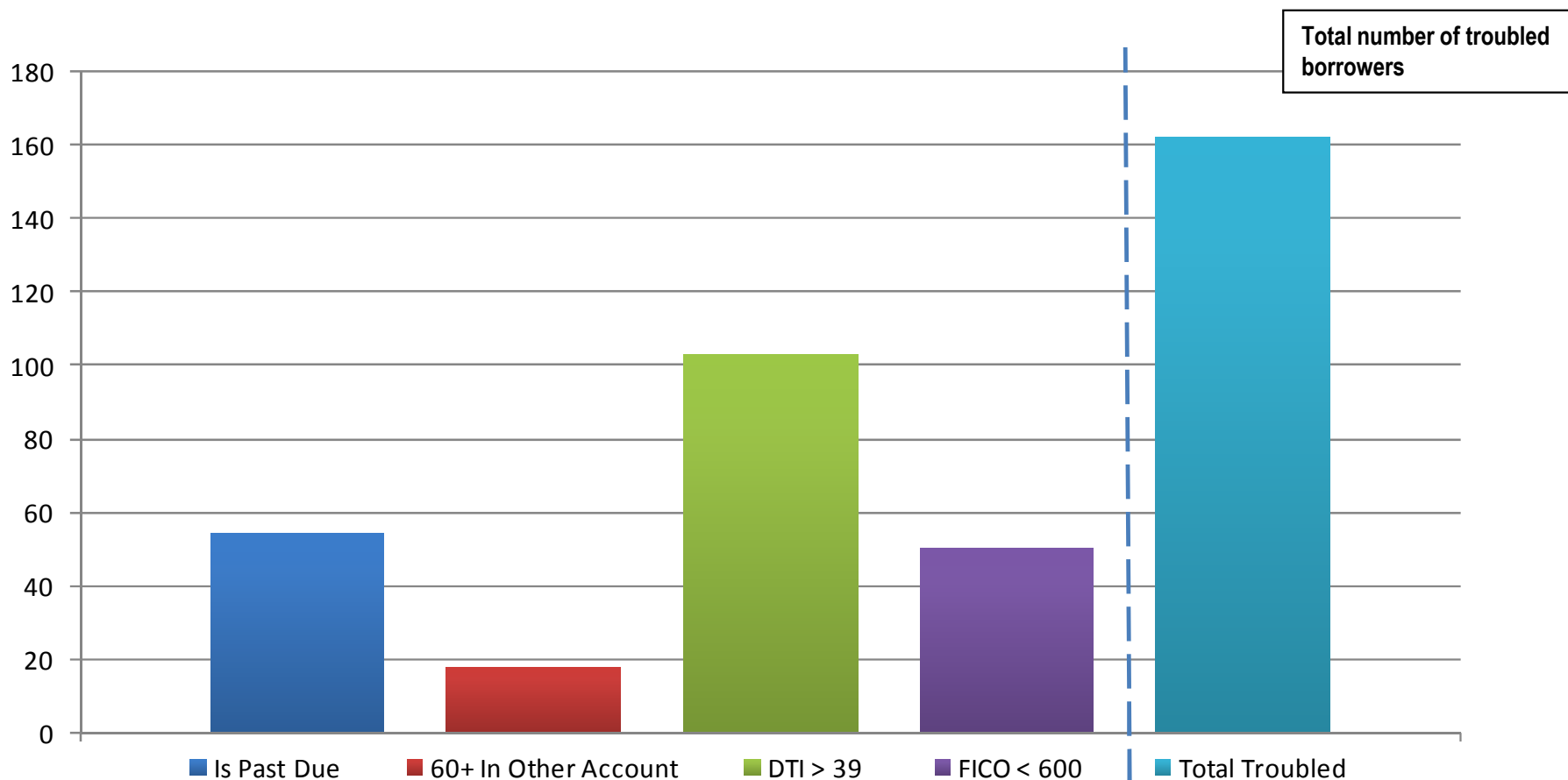
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Borrowers At Risk

GSR Mortgage Loan Trust 2006-AR1

- Borrowers who exhibit risk characteristics in their credit profiles, exclusive of their mortgages

Number of Borrowers Current on Mortgage with Credit Concerns



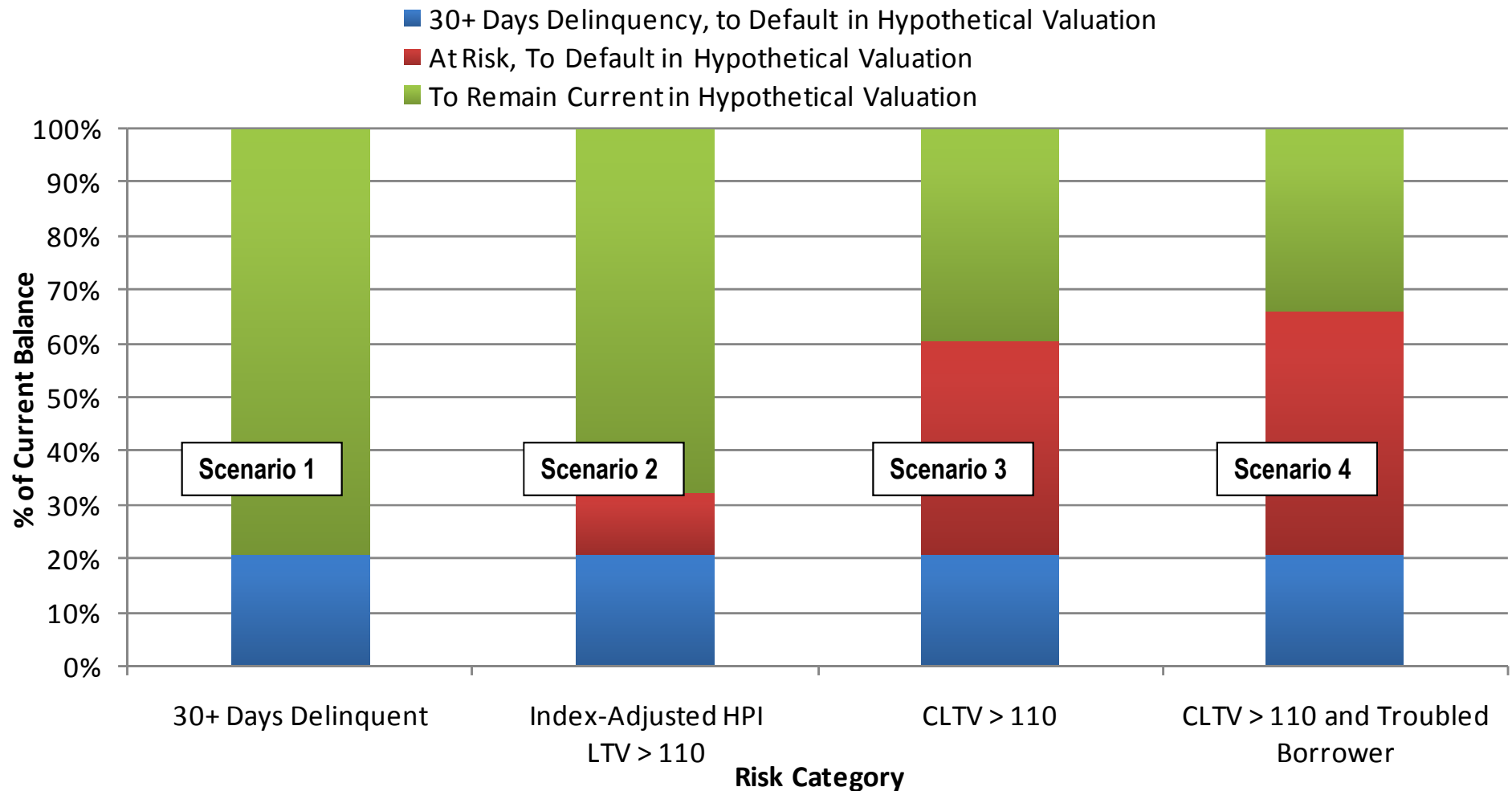
Source: Standard & Poor's analysis as of December 2010 and Experian credit information as of November 2010.

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At Risk Borrowers By Risk Category

Defaulting Under Four Hypothetical Valuation Scenarios

Borrowers by Risk Category



Source: Standard & Poor's analysis as of December 2010, Experian credit information as of November 2010 and Veros data as of Q2 2010.
AVM = Automated Valuation Model.

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Scenario Assumptions – Four Possibilities

Increasing Granularity Provides Investor Insight Into The Security

Scenarios (1-4)	1. Deal-level	2. Loan-level with HPI -adjusted LTVs	3. Loan-level with current CLTVs	4. Loan-level with current CLTVs and borrower information
Delinquency (\$ amount)	\$144.3 mm	\$144.3 mm	\$144.3 mm	\$144.3 mm
# of mortgages and \$ amount outstanding of mortgage LTV>110	0/\$0	137/\$79.4mm	458/\$276.2mm	458/\$276.2mm
# of mortgages and \$ amount outstanding of troubled mortgages	0/\$0	0/\$0	0/\$0	59/\$39.6mm
Total default amount	\$144.3 mm	\$223.7mm	\$420.4mm	\$460.0mm
Constant prepayment rate (CPR)	14.812%	14.812%	14.812%	14.812%
Loss severity	40.772%	43.28%	43.28%	43.28%

Source: Experian credit information as of November 2010; Veros data as of Q2 2010; and Standard & Poor's analysis as of December 2010.
HPI = House Price Index. CLTV = Current loan-to-value.

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Comparison Of Different Valuation Approaches

GSR Mortgage Loan Trust 2006-AR1

Tranche	2A4
CUSIP [®]	3623414D8
Original Standard & Poor's Rating ¹	AAA
Current Standard & Poor's Rating ¹	B+ (sf)
Original support (%)	9.00
Current support (%)	7.74

	Deal-level	Loan-level with HPI-adjusted LTVs	Loan-level with current CLTVs	Loan-level with current CLTVs and borrower information
Price (%)	87.4%	79.0%	58.3%	54.0%
Weighted-average life	8.01	6.76	3.67	3.04
Modified duration	6.27	5.76	3.62	2.92
Modified convexity	0.56	0.50	0.24	0.15
Principal write-down (\$)	4.4mm (2.91%)	20.8mm (13.84%)	62.6mm (41.53%)	71.1mm (47.21%)
Total collateral liquidation (\$)	136.2mm (20.19%)	215.7mm (31.96%)	412.4mm (61.11%)	452.0mm (66.97%)
Total collateral loss (\$)	55.6mm (8.23%)	93.3mm (13.83%)	178.5mm (26.45%)	195.6mm (28.98%)

AVM = Automated Valuation Model.

Source: Intex Solutions, Inc. Deal data as of January, 21 2011, priced to a spread of 348bps.

1. Source: Standard & Poor's Global Credit Portal[®] as of January 21, 2011.

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Next Steps...

Additional Datapoints for consideration

- **Forecast home values**
- **Default/REO valuation**
- **Credit and mortgage inquiries**
- **Auto loan/lease balances**
- **Number of publicly filed bankruptcies**
- **Number of bankcards with utilization $\geq 50\%$**
- **Loan modifications/recidivism rates**

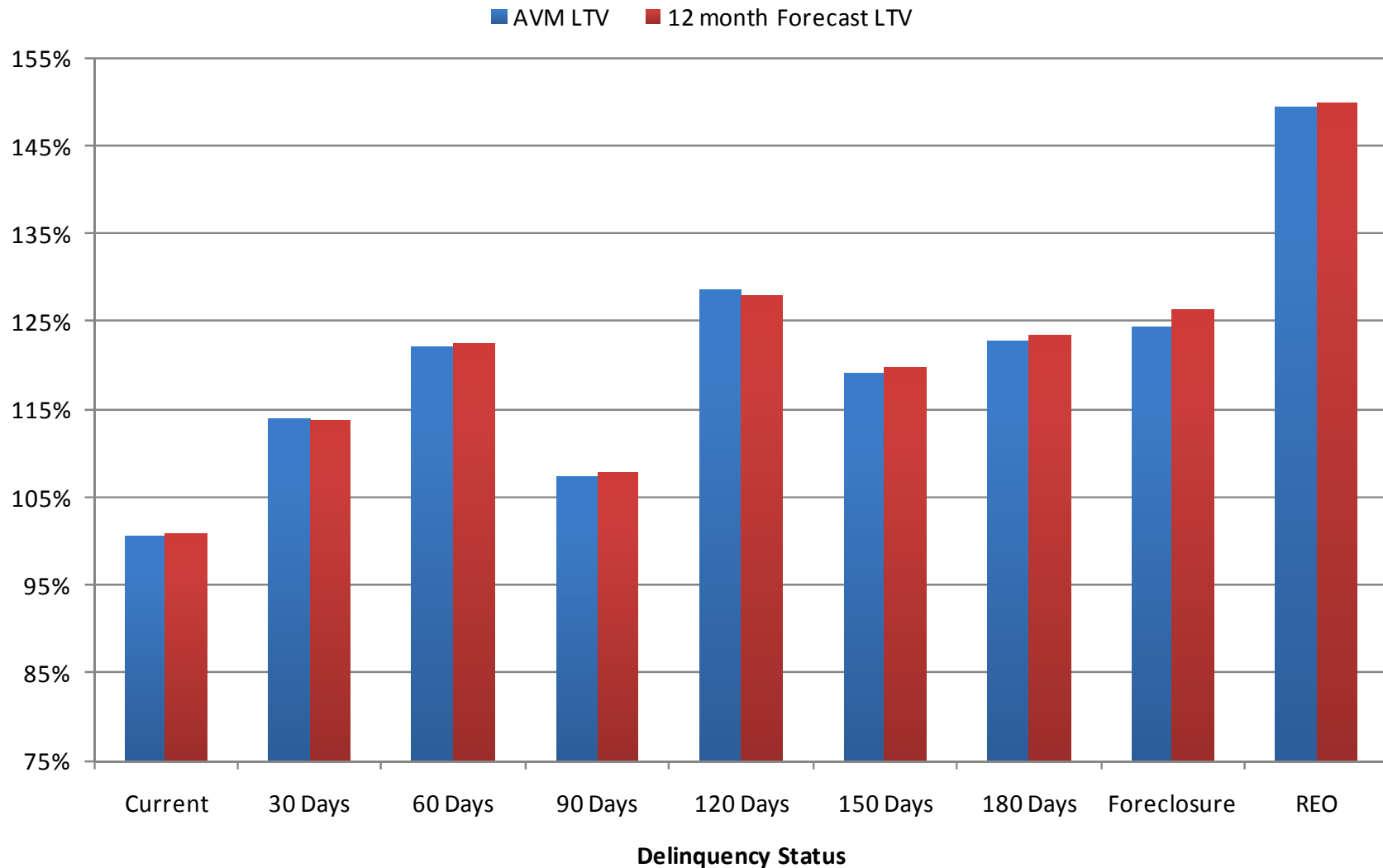
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Distressed Properties Likely To Display Increasing LTVs In One Year

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Current AVM LTV and 12-month Forecast LTV



Source: Veros data and forecast as of Q2 2010, Standard & Poor's analysis as of December 2010.

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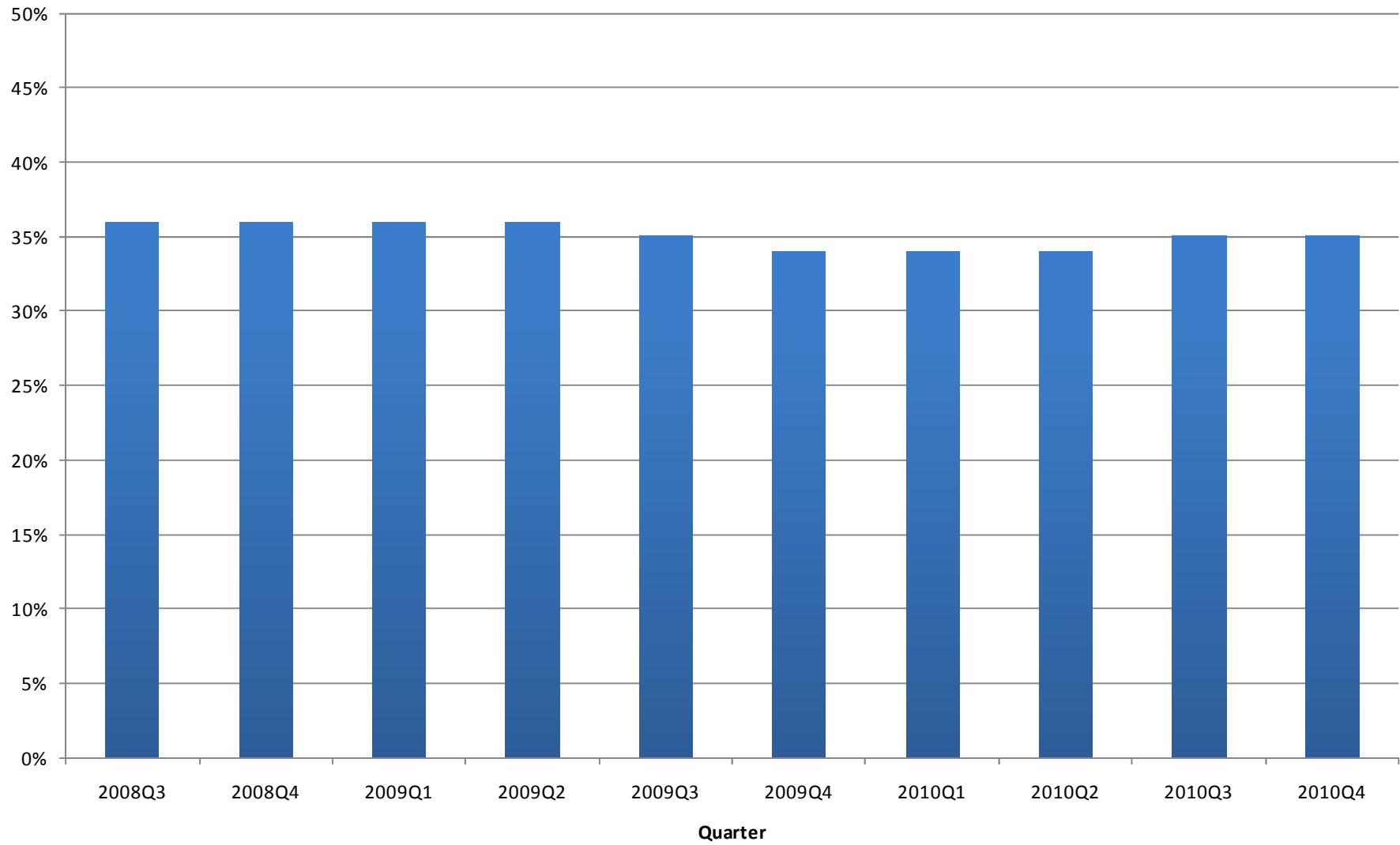
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Borrowers Have More Mortgage Debt Than Originally Disclosed

GSR Mortgage Loan Trust 2006-AR1

Percent of Borrowers in Pool with Multiple First Mortgages



Source: Experian and Standard & Poor's analysis as of December 2010 credit information as of November 2010.

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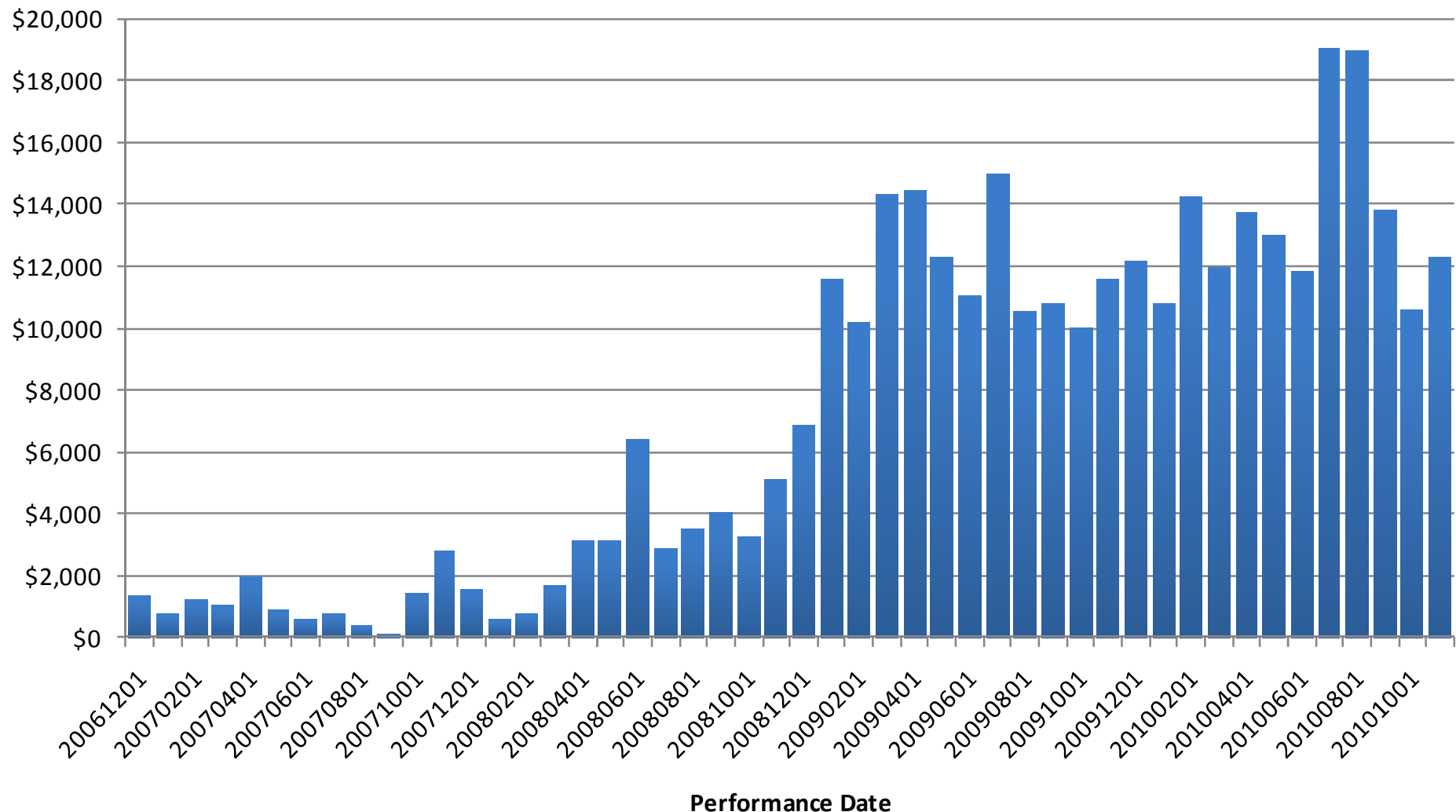
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Looking To Other Accounts For Payment Issues

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Average Balance of Accounts 60+ Days Delinquent



Source: Experian and Standard & Poor's analysis as of December 2010 credit information as of November 2010.

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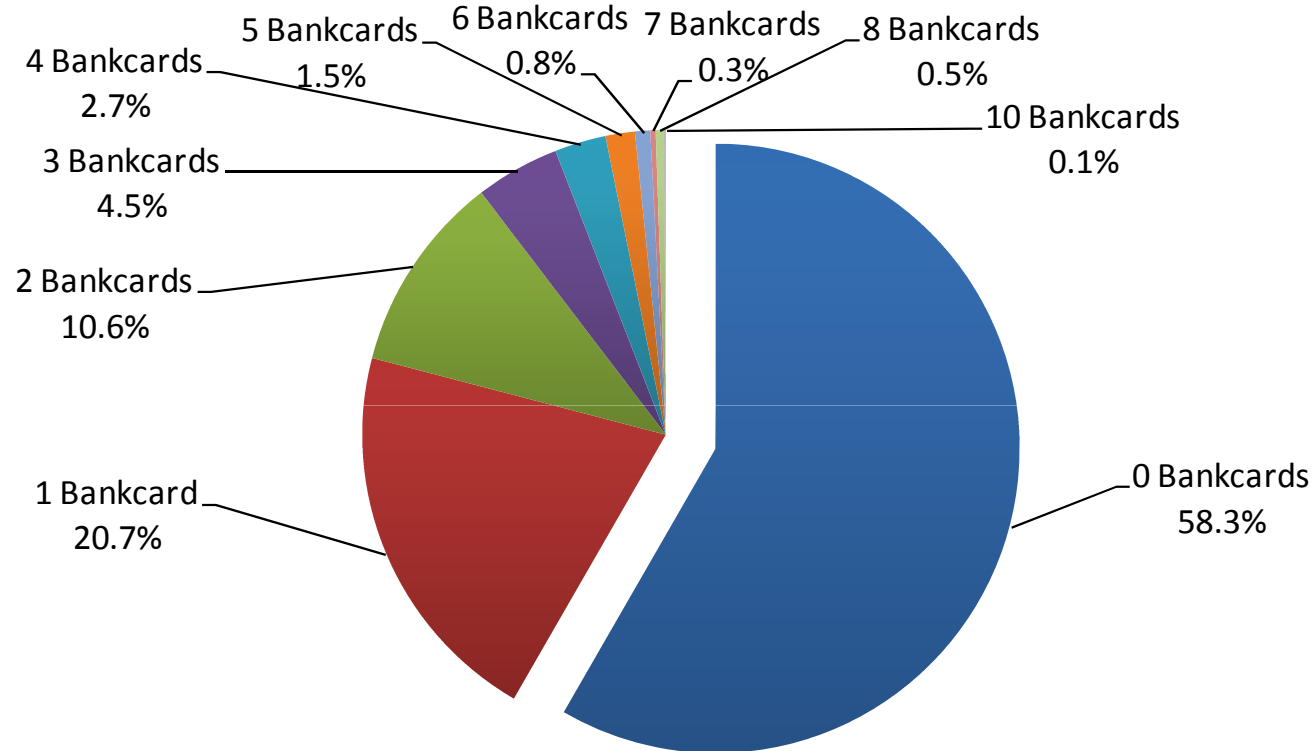
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Numerous Borrowers With High Credit Utilization

GSR Mortgage Loan Trust 2006-AR1

Borrowers by Number of Bankcards With $\geq 50\%$ Utilization Rate



Number of Bankcards with $\geq 50\%$ Utilization Rate	Percentage of Borrowers
0	58.3%
1	20.7%
2	10.6%
3	4.5%
4	2.7%
5	1.5%
6	0.8%
7	0.3%
8	0.5%
9	0.0%
10	0.1%

Source: Experian and Standard & Poor's analysis as of December 2010 credit information as of November 2010.

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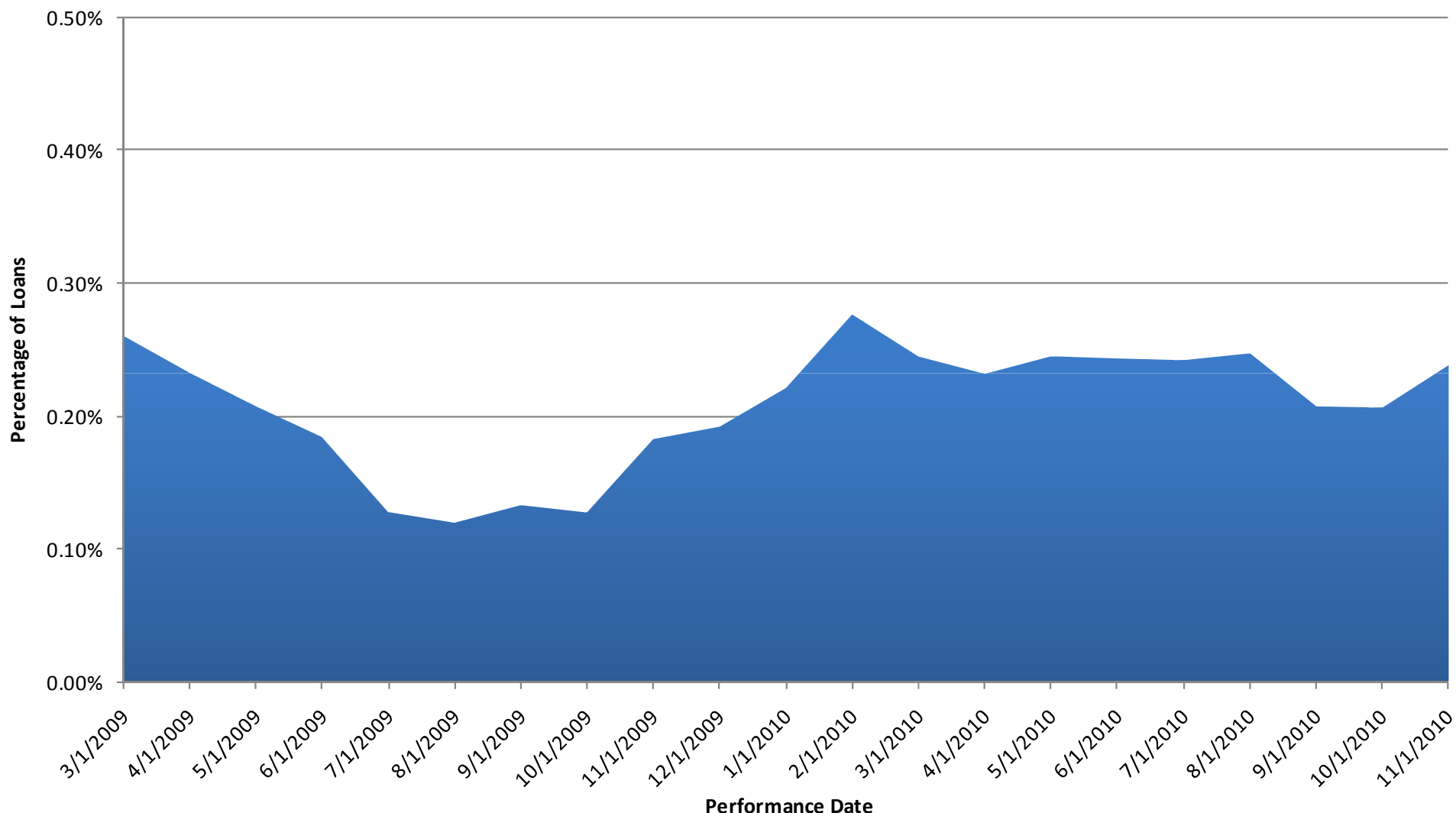
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Modification Levels Remain Consistent

Have Become Relatively Flat In The Past Year

Actual Modifications Administered



Source: Standard & Poor's Global Data Solutions U.S. RMBS Edition; 1010data, Inc. as of January 31, 2011.

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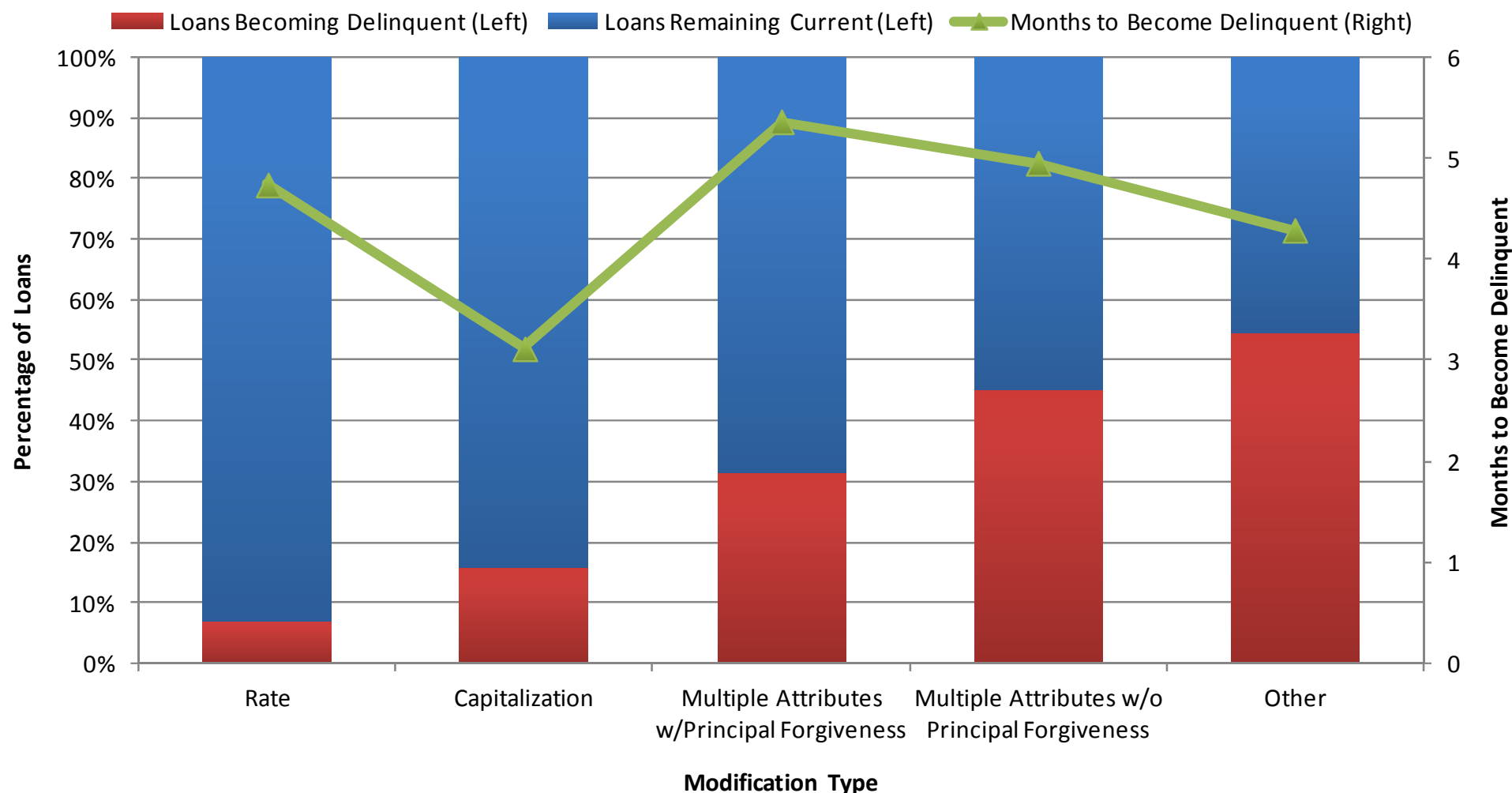
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Performance Differences Between Modification Types

Principal Forgiveness A Defining Factor

- Modifications administered March 2009 – July 2010

Modification Performance by Type



Source: Standard & Poor's Global Data Solutions U.S. RMBS Edition; 1010data, Inc. as of January 31, 2011.

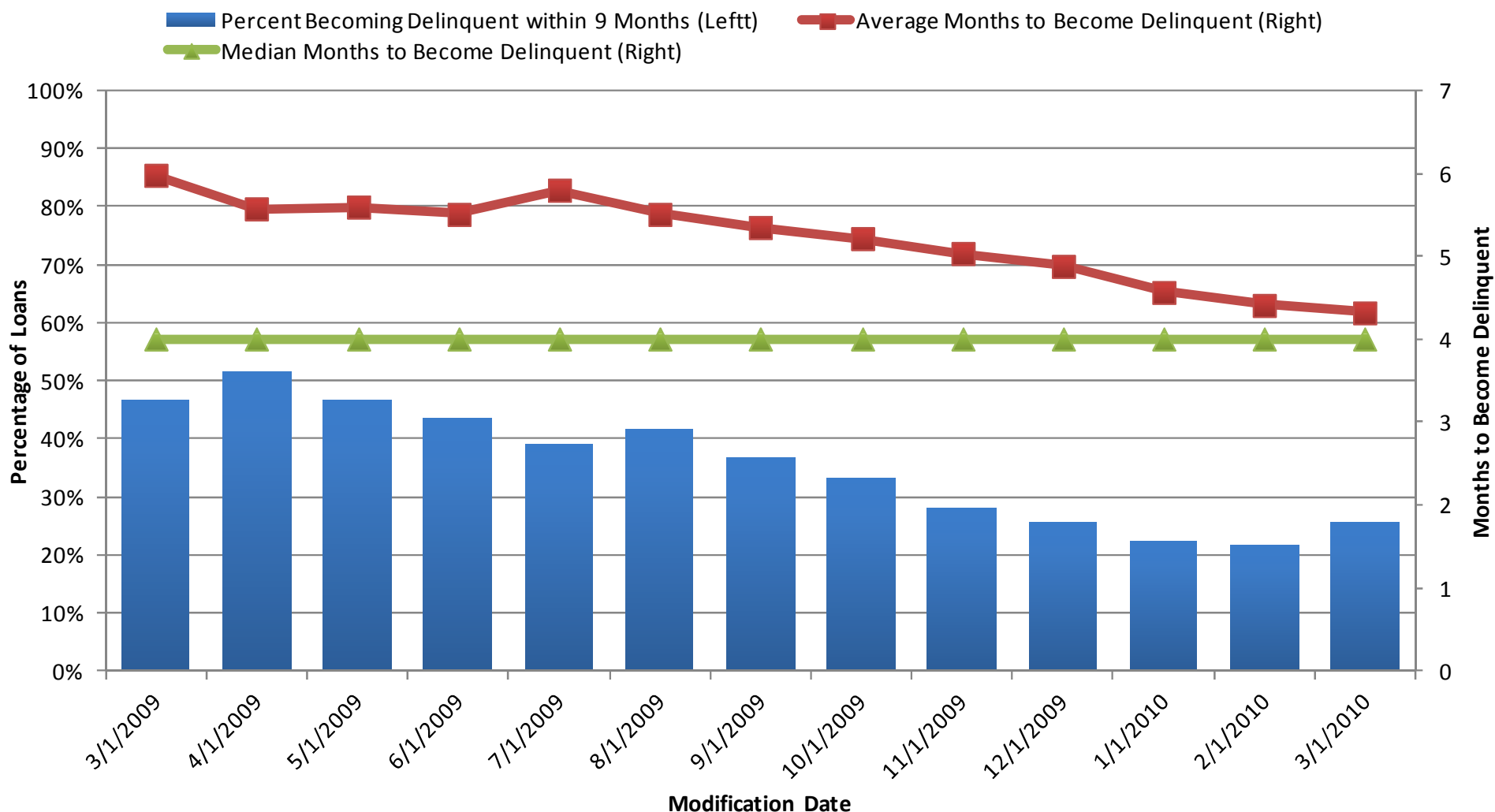
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Performance Of Modifications Showing Improvement

Number Of Loans Becoming Delinquent After Modification Are Declining

- **Modifications administered March 2009 – March 2010**

Performance of Modified Loans



Source: Standard & Poor's Global Data Solutions U.S. RMBS Edition; 1010data, Inc. as of January 31, 2011.

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RMBS Loan-Level Analytics Workshop

Key Takeaways

- **Increased transparency via loan-level data allows insight into credit patterns, delinquency, default and borrower payment behavior**
- **Updated property valuation assessments and forecasts allow for sophisticated loan-level analysis**
- **Combining current borrower data with loan-level and property specific valuation information provides the most insight into mortgage risk and facilitates decision making**
- **Credit models incorporate multiple attributes with increasing sophistication**

Speakers

- **Jim Elder, Solutions Architect, Standard & Poor's**
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- **Suzanne Carter, Associate Director, Standard & Poor's**
 - suzanne_carter@standardandpoors.com

Appendix: Global Data Solutions U.S. RMBS Edition – Data Sets To Facilitate Analysis

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U.S. RMBS Edition: Coverage, Granularity, Timeliness

Delivering A Solution To End Users

- **Broad and deep coverage including**
 - Subprime, Alt-A, and prime jumbo collateral types
 - Loan-, class- and deal- level data
 - More than 5,000 deals based on Standard & Poor's credit-rated U.S. residential mortgage-backed securities (RMBS), approximately 90+% of the total universe¹
 - S&P loan-level identifier uniquely identifies each mortgage loan from origination to maturity
- **Standard & Poor's Global Data Solutions third-party agreements**
 - VEROS agreement – provides dynamic property valuation, forecasting and market risk data
 - Experian agreement – provides current borrower credit information
- **Robust methodology and data**
 - Extensive quality controls to strive for consistency, completeness and timeliness
- **Loan modification data**
 - Actual as-reported loan modification performance data is available in U.S. RMBS Edition, spanning various collateral types (subprime, Alt-A, prime jumbo, HELOC, etc.)
- **Flexible subscription options**
 - Access entire universe of transactions, specific portfolio of securities, criteria-based data package

1. Source: The McGraw-Hill Companies, Inc. Investor Fact Book 2008-2009. P.40, "Mortgage-Backed."

Dynamic Property Valuation Data From Veros

Robust Methodology And Data, 10 Years Of History

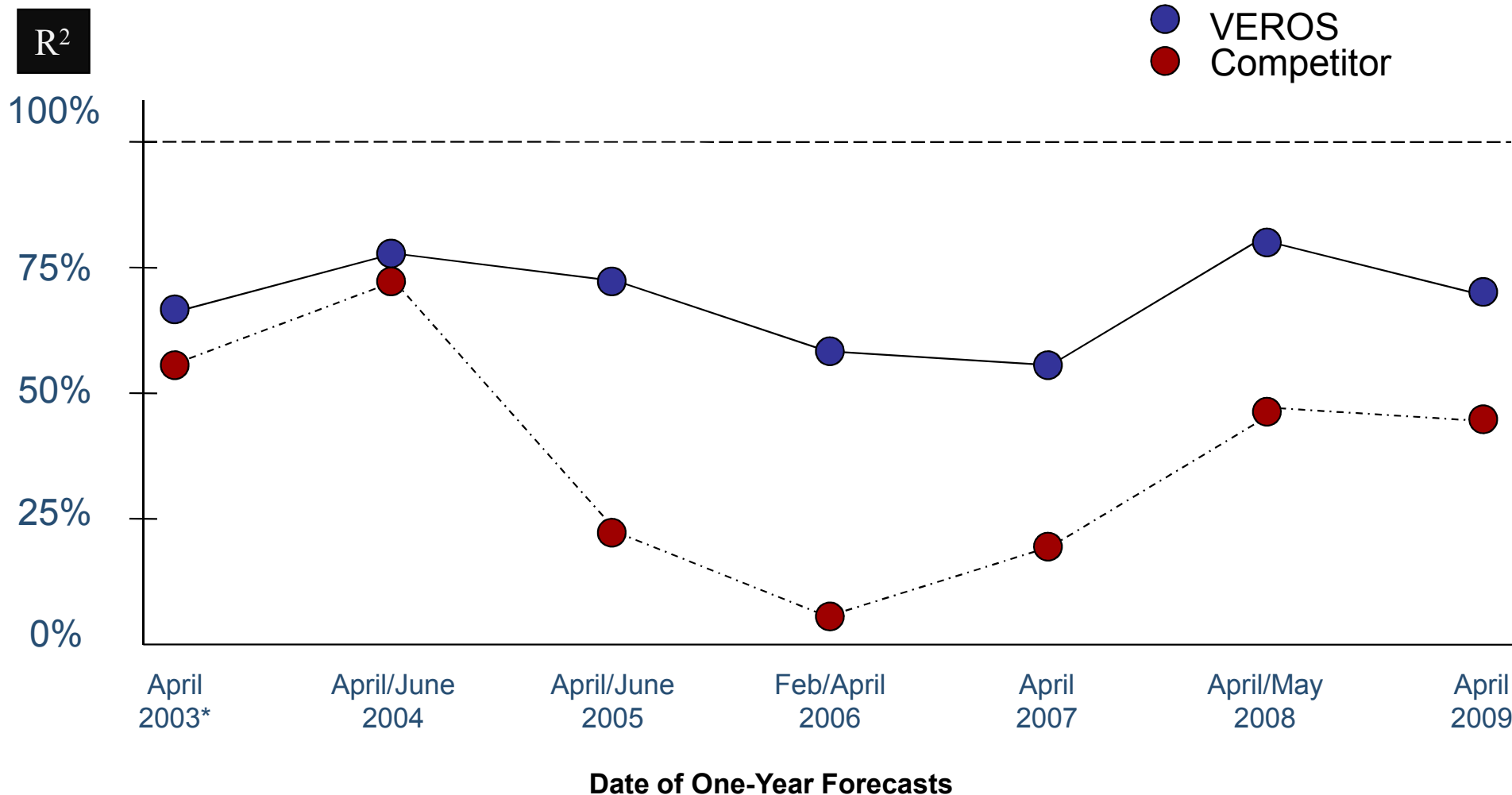
- Veros provides critical and unique valuation data and analytics including 13 data elements available in the U.S. RMBS Edition that are updated and delivered quarterly
- Global Data Solutions' agreement with Veros provides the U.S. RMBS Edition with dynamic property valuation data
- Veros utilizes multiple proprietary Automated Valuation Models (AVMs) to perform each property valuation, including
 - Hedonic models – based on comparable sales, and emphasize valuation accuracy over breadth of property coverage
 - Index models – emphasize breadth of property coverage over specific valuation accuracy
 - Hybrid models – utilize attributes of hedonic and index models to provide more balanced result sets
- The data set includes

Available Data	Analytical Value-Add
Current valuation	Determine baseline collateral values using current property valuations
Current LTV	Project defaults and losses using updated LTV ratios
Current CLTV	Analyze the risk of additional liens outside of the securitized pool with updated CLTV ratios
Home Price Index (HPI)	Track home prices for a property for an additional estimate of the current value
Default/REO Valuation	Project loss severity on distressed properties using default/REO valuations
Home price forecast	Project future risk exposure with home price forecasts more than 18 months forward
Market risk scores	Identify markets at risk for high pre-foreclosure, foreclosure, price volatility and fraud

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Property Valuation Forecasts From Veros

Higher Is Better



Source: Veros Real Estate Solutions.

*Denotes plotting of competitor 1998-2002 information. Slight differences exist for the time when each forecast was made (Feb. vs. April vs. May vs. June).

For further information regarding calculations of Veros forecasts, please contact Adrienne Kimble, Veros Real Estate Solutions at akimble@veros.com.

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Consumer Credit Data From Experian Capital Markets

Increased Transparency Into Credit Risk Migration

- **Experian Capital Markets CreditHorizons for Securities matches consumer credit information to the collateral data files backing each deal**
 - Offers unique insight into the credit behavior patterns that foreshadow delinquency, default and prepayment statistics
 - Provides the critical consumer behavior data needed to determine a realistic valuation of mortgage-backed securities portfolios
- **Experian's CreditHorizons for Securities and S&P Valuation and Risk Strategies now offer**

Consumer Credit	Analytical Value-Add
Credit scores	Forecast of potential delinquent payments
10 Credit attributes	Early signals of credit payment changes
Debt-to-income ratio	Pre-calculated total DTI using Experian's Income Insight SM model
Historical data	24 months of history available
Delivery	Direct data feed or through 1010data
Data set	Full data set or customizable to your securities portfolio

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