VECTORS™ Analytics

PREPAYMENT, CREDIT & VALUATION SOLUTIONS FOR AGENCY, NON-AGENCY PRIME & SUB-PRIME MBS

ANDREW DAVIDSON & CO

Turning mortgage data into investment insight

Home prices, remittance reports, prepayments. Mortgage data is all around us. But to make good business decisions, mortgage data needs to be transformed into accurate forecasts that describe how loans and securities are likely to perform. Andrew Davidson & Co., Inc. has been providing mortgage forecasts and valuation solutions since 1992. When your concerns are prepayments, delinquencies, defaults or losses, we have an analytical solution for you.

VECTORS™ Analytics

The tools you need to reveal the value and manage the risk of your portfolio.

PREPAYMENT MODELS

(MBS & ABS Prepayment Model, Custom Prepayment Model)

Manage interest-rate risk by forecasting the sensitivity of MBS and ABS prepayments to various factors such as home prices, interest rates, loan age, burnout, turnover and seasonality.

CREDIT MODELS

(LoanDynamics™ Model, HPI Generator, Implied Default Model)

Building on the output provided by our prepayment models, our credit models provide the forecasts you need to understand the delinquency, default and loss probabilities inherent in non-agency mortgages.

VALUATION MODELS

(OAS Subroutine, IR Process, RiskProfiler™)

Make better hedging, valuation and risk management decisions by seeing how your position will behave under different yield curve, volatility and home price scenarios.

DEMO OUR PRODUCTS FOR ONE MONTH   CONTACT US AT: 212.274.9075

Understand and manage interest-rate risk

VECTORS™ Prepayment Models draw on the collective experience of leading experts in the industry to address your valuation and risk management concerns. Leverage the power of Andrew Davidson & Co., Inc.'s market-standard tools or customize the tools to reveal the embedded risk and value in your portfolio.

Our robust and stable prepayment models give you the insight you need to make investment decisions as well as the power to monitor and adjust those models based on changes in the marketplace.

OUR APPROACH TO PREPAYMENT MODELING

VECTORS™ Prepayment Models calculate a vector of monthly prepayment speeds for agency, non-agency prime and sub-prime loans/pools for fixed and adjustable-rate mortgages. Model factors include housing turnover, interest rate refinancing, cash-out refinancing (due to home price appreciation), and credit cure. These factors are modeled using aging, seasonality, spread-at-origination, burnout and yield curve spread. The models use enhanced loan level details to adjust prepayment speeds based on the characteristics of the loan. The agency model considers loan size, original loan-to-value, credit score, regional home price indices, geographic location, property type, loan purpose and occupancy type to adjust speeds. The non-agency model takes into account original loan-to-value and original loan size to adjust speeds. The ARM model can forecast speeds on loans with interest-only (IO) and prepayment penalty periods. The suite of models also includes a model for option ARMs.

ACTIVE-PASSIVE DECOMPOSITION (APD)

Burnout in a mortgage pool is modeled by separating the borrowers in the pool into two separate groups – active and passive. This active-passive decomposition allows the model to quantify and forecast the different behavior of the borrowers who can and cannot refinance in an efficient manner.

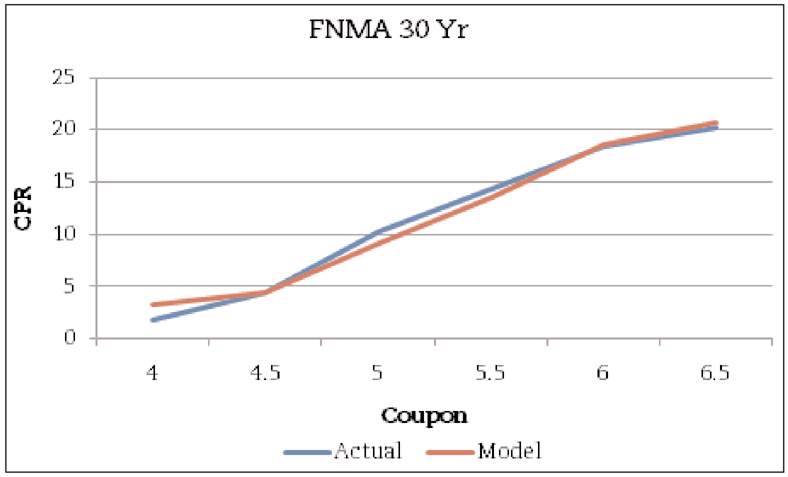
RISK AVERSION METHODOLOGY

Borrowers are inherently risk averse to rate resets. To model prepayment behavior near ARM reset dates, the model uses a forward averaging methodology. The model first forecasts the expected interest rate the borrower will face at reset, based on the cap/floor/margin structure of the loan, and the term structure of interest rates. It then uses the moving 6-month forward average to calculate the effective loan rate for that month. In an upward sloping yield-curve environment, as the coupon keeps going up so does the prepayment speed. Speeds reach a peak around the reset date.

FEATURES AND CAPABILITIES

SEE FOR YOURSELF HOW THE MODEL IS PERFORMING

Dynamic performance reports provide an objective view of actual vs. forecasted results. Run these reports on our website, specifying the analysis period and cohort definition by vintage, coupon bucket, or as-of date to generate user-defined displays of how the model is performing versus actual speeds.



Dynamic Performance Reports show actual vs. AD&Co Prepayment Model forcasted speeds for user-selected time-period and collateral

TUNING THE MODEL

Visible tuning dials allow you to change model forecasts for a specific portfolio or during changing market conditions. Current tuning dials allow the user to tune Refi, Turnover, Cashout, Credit Cure, Aging, SATO, Curve Spread, Lag, Scale, Slide and Burnout. Vectored tuning allows users to specify a time dimension to tuning parameters. Users can select the number of periods the tuning parameters are in effect.

CUSTOM PREPAYMENT MODELS

We can design custom prepayment models to analyze specific pools of loans. Once the models are developed and tested, AD&Co will program software and subroutines for the models that can easily be integrated into any proprietary system or an existing vendor package.

MODEL DELIVERY

In addition to stand-alone Excel and web-based versions of our models, we offer dynamically linked libraries or shared objects that are easily incorporated into most proprietary risk management and valuation solutions. VECTORS™ prepayment models are available on a wide variety of platforms for easy integration into leading analytical risk management systems:

VENDOR PARTNERS				
	Algorithmics	IPS Sendero/Fiserv	Murex	RiskSpan
	BancWare	Markit	Numerix	SS&C
	Bloomberg	Measurisk	Polypaths	SunGard/Prophet
	Compass Analytics	MIAC/DecisionServ	Principia Partners	Towers Watson/Moses
	FactSet Research	Milliman	QRM	Wall Street Analytics
	INTEX	Misys	RiskMetrics	ZM FinancialSystems

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Measure the credit risk of your mortgage portfolio with greater precision

Building upon AD&Co's expertise in prepayment modeling and OAS valuation techniques, our credit models provides a comprehensive solution for analyzing and predicting the behavior of your credit-sensitive mortgage portfolio.

THE LOANDYNAMICS™ MODEL

The LoanDynamics™ Model gives you useful information about how loans will perform by tracking borrower behavior over the lifetime of a loan. Using historical data and studies of how people actually make their monthly payments, we accurately forecast how borrowers are likely to behave based on strong economic rationale.

The LoanDynamics™ Model can utilize loan or pool level data. When loan level data is used, every single loan that backs the security is analyzied, resulting in more accurate forecasts.

For issuers and investors, our model forecasts key investor performance metrics such as CPR (prepayment), CDR (default), 60+ delinquency and loss severity, given loan characteristics and a user-driven scenario for interest rate and house price indices. Our open architecture gives you the flexibility to tune the model according to parameters you set.

The LoanDynamics™ Model goes beyond the traditional "two-state" competing risks model that forecasts only prepayments and defaults, to include forecasts for a number of loan transitions, including 60+ delinquencies to account for the impact on bond triggers. We have condensed the number of transitions to those which have sound economic rationale and the greatest impact on investment performance.

The model is unified across credit sector (jumbo prime, subprime, Alt-A/B, High LTV) and product type (fixed, adjustable, hybrid, IOs, first and second lien) and relies on observed loan characteristics (i.e., data available in the typical servicing system file) to make its projections. As a result, users are not required to make potentially arbitrary judgments about credit sector or product type and users can apply the model to pools of loans containing a wide mix of underlying collateral.

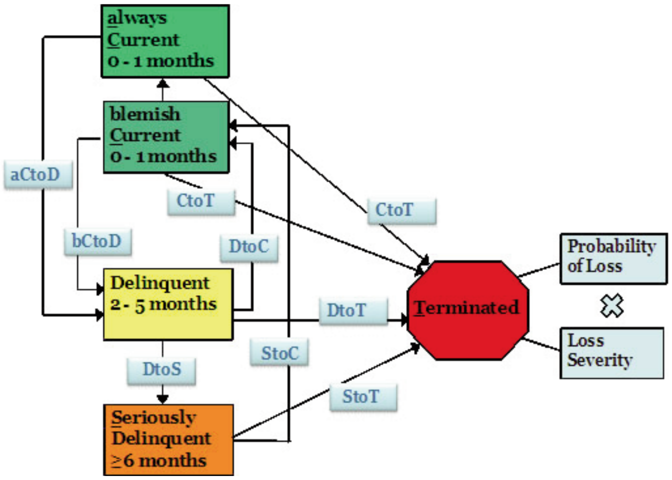
This model is also capable of handling recent legislative/social events such as loan modifications.

KEY TRANSITIONS Prepayment, Delinquency, Default, Cure, Recovery and Liquidation

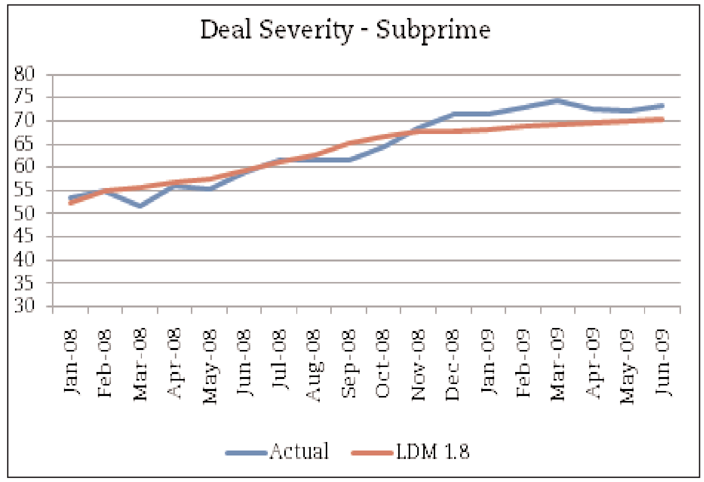
KEY MODEL DRIVERS Loan level characteristics (such as LTV, FICO and Original Loan Balance), paths of future interest rates and HPI.

KEY MODEL OUTPUTS Monthly forecasts for the remaining life of the loan Prepayments (CPR), Defaults (CDR), 60+ & 180+ Delinquencies, Loss Severity and Cumulative Loss.

SEE FOR YOURSELF HOW THE MODEL IS PERFORMING



The LoanDynamics™ Model key transitions



Model Performance

MODEL DELIVERY

We offer the LoanDynamics™ Model as a C+ subroutine, delivered either as a Windows dynamically linked library (DLL), a Unix shared object, or easy-to-use application embedded in Excel. The subroutine is ready for integration into customers' internal systems and is available through the Compass Analytics, FactSet Research, INTEXdesktop, Polypaths, QRM, RiskProfiler™, and RiskSpan systems. We also provide technical support for integration of the LoanDynamics™ DLL into any proprietary system.

OTHER CREDIT-RELATED MODELS

HOME PRICE INDEX GENERATOR

The home price index generator (HPI generator) produces a Monte Carlo path of projected HPI at the national level. The model simulates home prices consistently with FHFA historical data and includes an interest rate term pointing to mortgage affordability, a general "diffusion" reflecting other inertial economic factors, and "jumps" responsible for random return on real estate. These factors, separated historically by the Kalman filtering, reflect realistic volatility and the correlation structure for the US and geographical HPI indices and help value the borrower default option.

IMPLIED DEFAULT MODEL

The implied default model draws on AD&Co's advanced OAS technology to compute the value of ABS tranches under a range of prepayment and default scenarios, relating market-observed bond prices to a distribution of defaults and losses.

CREDIT OAS is AD&Co's complete valuation solution for credit-sensitive instruments, described in more detail in the following section.

Make better hedging, valuation and risk management decisions

VECTORS™ valuation models integrate prepayment and credit models to provide the analytical platform to make better hedging and risk management decisions. We help you make "cheap-rich" decisions for trading and "profile" risk exposure to interest rates, home prices or prepayment model errors. Our valuation system can run large MBS portfolios and covers common bonds and interest rate derivatives.

OUR APPROACH TO VALUATION MODELING

BLAZING SPEED

Used exclusively by our system, backward induction on a single-factor interest rate grid allows you to accurately price MBS pass-throughs nearly instantly. VECTORS™ Valuation Models converts OAS into prices for in about 0.1 seconds. Moreover, multiple scenario prices and duration and convexity measurements are taken from the same valuation grid in no additional time.

IMPROVED & CONTROLLED ACCURACY WITH MONTE CARLO

We value structured CMOs and ABS with random Monte-Carlo simulations. Though our standard Monte-Carlo utilizes common enhancements like "rate fudging" or antithetic reflection, we recommend using our enhanced sampling method known as quasi Monte Carlo. In quasi Monte-Carlo, after random shocks are generated and ortho-normalized before they are actually used. This pre-processing step ensures that the shocks are serially independent and, of needed variance (hence volatility). Tests show that this quasi Monte-Carlo method is twice as accurate as regular Monte-Carlo for the same number of paths.

PREPAY RISK NEUTRALITY

Prepay-risk-and-option-adjusted spread (prOAS), available only with VECTORS™ Analytics, is a measure that accounts for the risk premium built into MBS prices due to prepayment uncertainty. Create a risk-neutral model by tuning the turnover and refinance parameter dials of the base prepayment model using available TBA prices or the IO/PO valuation parity.

OAS ADJUSTED FOR CREDIT

The Credit OAS methodology reflects both prepayment options and default options (losses) exercised by borrowers. The complete option-and-credit-adjusted valuation methodology runs specialized Monte Carlo with two key stochastic factors, interest rates and home prices. The analysis is performed loan-by-loan with all modeling set-ups, "tunings" and default values exposed to and controlled by the user.

...AND OTHER CREDIT ANALYSES

- Breakpoint ratio analysis and credit scenario grid
- Histograms of write-downs, losses & defaults for bonds & portfolios
- Missing data inspection and replacement tool
- Sensitivites to model tunings & home price factors

VISIT US ONLINE AT: www.ad-co.com

INTEREST RATE MODELS

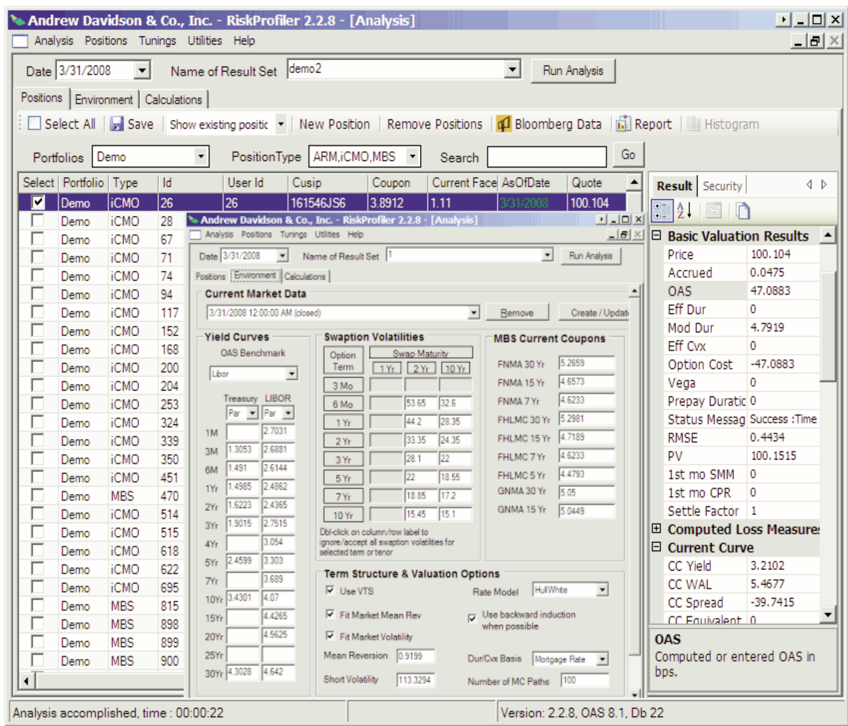
In addition to using VECTORS™ prepayment, credit models, and HPI Generator, users may select among three 1-factor short-rate models, Hull-White, Black-Karasinski, Squared Gaussian and a 2-factor Gaussian model. Every interest rate model can be instantly calibrated to a swap or Treasury curve and a matrix of at-the-money (ATM) swaptions. Each of our models can operate with either time-dependent or constant volatility. With the ATM volatility surface used as the input, volatility skew is completely controlled by the model selection itself.

INTEGRATED DATA LINKS

For structured deals, our valuation models are programmed to include seamless links to Intex or Markit. The Bloomberg API utilities are also built in to automatically load market rates, volatilities, MBS indicatives and even collateral details.

MODEL DELIVERY

RISKPROFILER™ is AD&Co's database-driven (MS SQL or Access) valuation solution that incorporates standard and advanced valuation techniques including OAS, prOAS, credit OAS (with the LoanDynamics™ Model) and derivative pricing. The thoroughly designed front-end exposes market data, valuation options, prepayment and LDM tunings and results. Multi-dimensional risk measures can be compiled for large portfolios of MBS, ARMs, CMOs (including credit impaired instruments) and standard rate derivatives to produce portfolio or strategy level summary reports. When processing credit-impaired instruments RiskProfiler depicts histograms for defaults, losses and write-downs, along with traditional valuation outputs.



EXCEL The Excel interface is transparent and ideally suited for quick ad-hoc analysis. Each position is entered as a single row, so any size portfolio can be priced. The Excel interface is an excellent validation tool for clients that have integrated the subroutine into a proprietary system.

OAS SUBROUTINE We distribute dynamically linked libraries for Windows and shared objects for many flavors of UNIX. This application provides unlimited operational power accessing large-scale corporate databases on virtually all computer platforms. In addition, Algorithmics, BancWare, Measurisk, Murex, and Reuters Systems have integrated our OAS libraries into their broader analytical solutions.

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PUBLICATIONS & ANALYSIS

The Pipeline is our monthly newsletter in which our knowledgeable development, consultant and sales teams share their considerable expertise on recent trends, changes and advances in the marketplace.

Quantitative Perspectives (QP) is an independent commentary in which we examine topical issues related to the mortgage and derivatives markets. This publication acts as a "white paper," providing an in-depth look into our models and methodologies.

Risk-Neutral Prepayment Model computes optimal tuning parameters to the AD&Co prepayment model that would value all agency MBS flat to agency debentures. This tuned prepayment model is called the risk-neutral model. Optimization is performed using TBA prices with market data from the close of every Friday and is available at www.ad-co.com.

Market Analysis consists of a weekly prepayment-risk-and-option-adjusted analysis of the 15yr and 30yr pass-through markets. The analysis includes current, forward and static prepayment speeds, OAS, prOAS, effective duration/convexity, tuning durations and key-rate durations. Valuation is performed for both "physical" and "risk-neutral" prepayment versions of our model. Market data is from the close of every Friday and is available at www.ad-co.com.

MODEL DEMOS

Proper model selection is crucial for optimal valuation. To help potential clients feel certain they are using the most appropriate model, we encourage firms to take advantage of our free trial offer prior to executing a license agreement. These trials demonstrate the model's full capabilities and are available through any of our vendor partner systems, Excel and online.

CLIENT SUPPORT

Fierce focus on client support differentiates us from many other model providers in the industry. Clients who license one or more of our models have access to our entire staff of consultants and developers for advice on model results and integration into their analytics. Because communication is the key to model evolution, we make efforts not only to listen to our clients, but also to make timely disclosures as to changes and revisions in the model that may impact their analytical results. We are available to speak to model users by phone, and our online support offers detailed user documentation and comprehensive data for internal integration specialists and developers.

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