



Kamakura
Corporation

KAMAKURA RISK MANAGER

VERSION 7.0

EXECUTIVE SUMMARY

ALM

Credit Risk

Market Risk

Basel II

FAS 157

FAS 133 Integrated Risk System

— SEPTEMBER 2008 —

www.kamakuraco.com

Telephone: 1-808-791-9888 • Facsimile: 1-808-791-9898

2222 Kalakaua Avenue, 14th Floor, Honolulu, Hawaii 96815, United States of America

© 2009 Kamakura Corporation. All rights reserved.



Contents

- I. Introduction to Kamakura Risk Manager
- II. KRM Features and Benefits
- III. Kamakura Risk Technology and Innovation
- IV. Rationale for KRM's Integrated Approach to Risk Management
- V. Advantage of KRM Default Probabilities
- VI. About Kamakura Corporation



I. Introduction

During the credit crisis of 2007-2008, the chief executive officers of Citigroup, Merrill Lynch, Bear Stearns, Wachovia and UBS were fired because of risk management failures at their organizations. Countrywide Financial was sold to Bank of America in a distress sale for the same reason.

Without exception, these institutions relied on legacy interest rate risk and market risk systems that were simply unable to answer one basic question: What happens to our institution if home prices drop by 20%?

Kamakura Risk Manager is designed to answer this and many closely related questions in order to provide management, boards of directors, shareholders and regulators an accurate view of the total risk of the organization, including traditional narrowly defined risk “silos”: asset and liability management, interest rate risk, transfer pricing, liquidity risk, credit risk, Basel II capital ratios, capital allocation, risk-adjusted return on capital, and market-oriented accounting calculations like FAS 133/IAS 39 and FAS 157.



II. Kamakura Risk Manager Features & Benefits

Kamakura Risk Manager (KRM) – first offered commercially in 1993 – has experienced continuous expansion and improvement since its first lines of code were written in 1990. The KRM system is written in modern C++ class libraries totaling more than 300,000 lines of code. KRM comes with a rich data base architecture that is Open Data Base Connectivity compliant with proper security. KRM runs on both Windows and Unix, and relational data bases like MS SQL Server, Oracle, and Sybase can all be used with KRM.

KRM is designed as a multiple-models risk management system, featuring a rich array of interest rate simulation techniques, default modeling approaches, prepayment simulation alternatives, and embedded options valuation methodologies. Kamakura Risk Manager is delivered with an optional set of Java-based web tools including the KRM-Risk Portal (rp) for wide dissemination of risk reports around the organization, KRM-Data Manager (dm) for easy data loading to KRM tables, KRM-Limits Manager (lm) for state of the art risk limits monitoring, and KRM-Loan Pricing (lp) for modern risk-adjusted return on capital loan pricing.

KRM produces cash flows, financial accruals, and valuations at all user-defined forward time periods for the full range of financial instruments, from collateralized debt obligation tranches to mortgage backed securities to simpler instruments like bonds, deposits, loans, credit default swaps, options, interest rate swaps, life insurance policies, non-maturity deposits, foreign exchange transactions, and so on.

III. Kamakura Corporation Risk Technology and Innovation

Kamakura is the leader in modern integrated risk management due to the 1995 insights of Kamakura's Managing Director for Research, Professor Robert Jarrow. Professor Jarrow, who also serves as senior research fellow at the Federal Deposit Insurance Corporation and Professor at Cornell University, linked credit risk with a random interest rates framework in his seminal paper with Stuart Turnbull. From that point in time, Kamakura has been dedicated to a completely integrated approach to risk management software design. Professor Jarrow is assisted in research efforts by Kamakura founder Dr. Donald R. van Deventer, named to the RISK Hall of Fame with Prof. Jarrow in 2002, and Professor Jens Hilscher, named senior research fellow in 2008. More than ten Kamakura staff members have contributed to 7 risk management books and over 140 published research papers.

IV. Rationale for KRM's Integrated Approach to Risk Management

Now widely understood is the fact that traditional approaches to “silo” risk management are simply special cases of best practice integrated risk management: a multi-period simulation of random changes in the macro-economic environment where the default probabilities of all counterparties, from retail to corporate to sovereign, move up and down with the economy. All cash flows, financial accruals, defaults and recoveries are captured through this multi-period simulation, and embedded options are exercised with the user-specified degree of rationality. As the graph below shows, the risk silos for the most part differ in only two dimensions: whether the simulation is multi-period (the general case) or single period (a special case), and whether or not defaults are “turned on” (the general case) or “turned off” (the special case):

All risk analysis is a special case of multi-period credit risk analysis		
	Special Case: Single Period Analysis with No New Assets or Liabilities	General Case: Multi-Period Analysis with Cash Flow Reinvestment and New Assets and Liabilities
Special Case: No Defaults	Traditional VAR for Market Risk	Traditional ALM for Interest Rate Risk
General Case: Allow Defaults Risk-factor Driven Defaults	Credit-Adjusted VAR	Best Practice Multi-period Credit-Adjusted Simulation and Valuation for Integrated Risk Management, Capital Allocation, and Total Balance Sheet Risk Hedging

V. Advantage of KRM Default Probabilities

Kamakura Risk Manager allows users to specify default probabilities and related formulas for retail, small business, corporate and sovereign counterparties using a traditional ratings-based transition matrix approach, the legacy Merton-style approach, or the state of the art reduced form modeling approach. KRM can seamlessly load default probabilities updated daily from the Kamakura Risk Information Services public firm and sovereign default probability data bases.

VI. About Kamakura Corporation

Founded in 1990, Kamakura Corporation is a leading provider of risk management information, processing and software. Kamakura has been a provider of daily default probabilities and default correlations for listed companies since November, 2002. Kamakura launched its collateralized debt obligation (CDO) pricing service KRIS-CDO in April 2007. Kamakura is also the first company in the world to develop and install a fully integrated enterprise risk management system that analyzes credit risk, market risk, asset and liability management, transfer pricing, and capital allocation. Kamakura has served more than 185 clients ranging in size from \$3 billion in assets to \$1.6 trillion in assets. Kamakura's risk management products are currently used in 27 countries.

Kamakura has world-wide distribution alliances with Fiserv (www.fiserv.com), Unisys (www.unisys.com), and Zylog Systems (www.zylog.co.in) making Kamakura products available in almost every major city around the globe.



2222 Kalakaua Avenue, 14th Floor
Honolulu, Hawaii 96815
United States of America

Telephone: 1-808-791-9888
Facsimile: 1-808-791-9898

Information: info@kamakuraco.com

www.kamakuraco.com