Statistical Models and Methods for Financial Markets (Springer Texts in Statistics)

By Tze Leung Lai, Haipeng Xing

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This book presents statistical methods and models of importance to quantitative finance and links finance theory to market practice via statistical modeling and decision making. Part I provides basic background in statistics, which includes linear regression and extensions to generalized linear models and nonlinear regression, multivariate analysis, likelihood inference and Bayesian methods, and time series analysis. It also describes applications of these methods to portfolio theory and dynamic models of asset returns and their volatilities. Part II presents advanced topics in quantitative finance and introduces a substantive-empirical modeling approach to address the discrepancy between finance theory and market data. It describes applications to option pricing, interest rate markets, statistical trading strategies, and risk management. Nonparametric regression, advanced multivariate and time series methods in financial econometrics, and statistical models for high-frequency transactions data are also introduced in this connection.

The book has been developed as a textbook for courses on statistical modeling in quantitative finance in master's level financial mathematics (or engineering) and computational (or mathematical) finance programs. It is also designed for self-study by quantitative analysts in the financial industry who want to learn more about the background and details of the statistical methods used by the industry. It can also be used as a reference for graduate statistics and econometrics courses on regression, multivariate analysis, likelihood and Bayesian inference, nonparametrics, and time series, providing concrete examples and data from financial markets to illustrate the statistical methods.

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Review

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"This text by Lai and Zing was completed as the tumult of 2008 was unfolding, but its methods are…timeless, and future students and teachers can benefit in better times from the clear and cohesive exposition that this text provides. …a useful text that anyone who teaches this material will want to consider. The list of topics covered is remarkably extensive; the exposition is always compact?and often quite elegant. …" ((Journal of the American Statistical Association, September 2009, Vol. 104, No. 487)

From the Back Cover

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Tze Leung Lai is Professor of Statistics and Director of Financial Mathematics at Stanford University. He received the Ph.D. degree in 1971 from Columbia University, where he remained on the faculty until moving to Stanford University in 1987. He received the Committee of Presidents of Statistical Societies Award in 1983 and is an elected member of Academia Sinica and the International Statistical Institute. His research interests include quantitative finance and risk management, sequential statistical methodology, stochastic optimization and adaptive control, probability theory and stochastic processes, econometrics, and biostatistics.

Haipeng Xing is Assistant Professor of Statistics at Columbia University. He received the Ph.D. degree in 2005 from Stanford University. His research interests include financial econometrics and engineering, time series modeling and adaptive control, fault detection, and change-point problems.

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