Bayesian Risk Management: A Guide to Model Risk and Sequential Learning in Financial Markets (Wiley Finance)

Matt Sekerke
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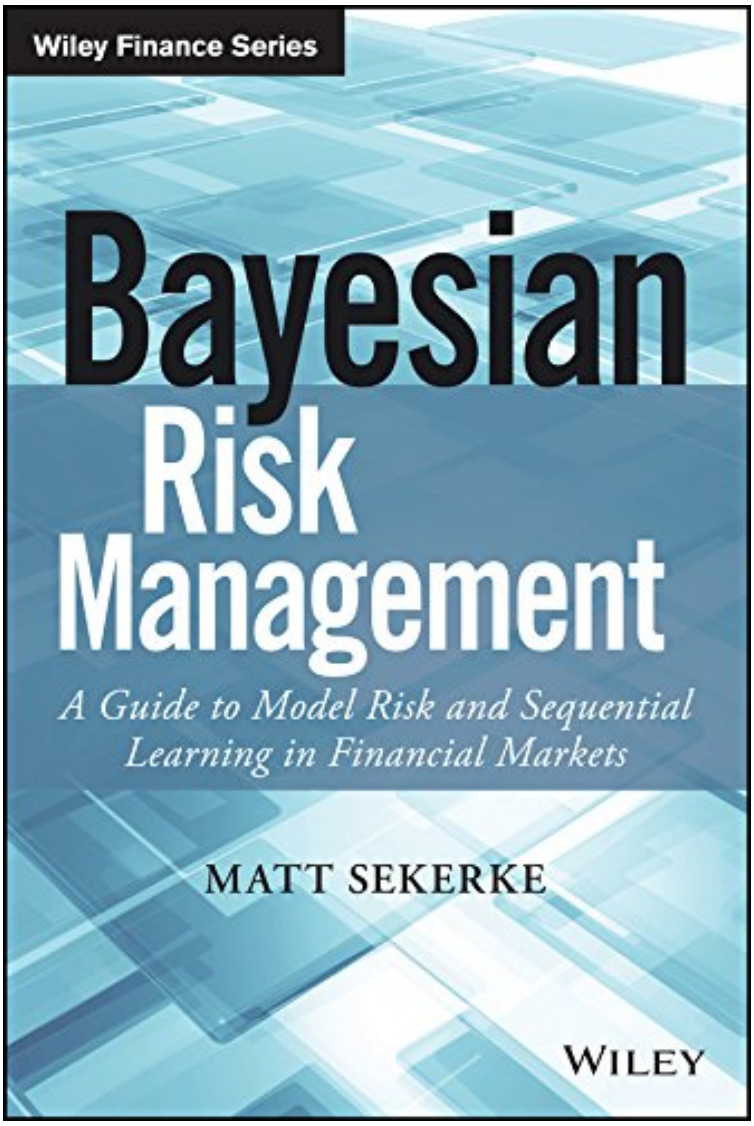

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Matt Sekerke : Bayesian Risk Management: A Guide to Model Risk and Sequential Learning in Financial Markets (Wiley Finance) before purchasing it in order to gage whether or not it would be worth my time, and all praised Bayesian Risk Management: A Guide to Model Risk and Sequential Learning in Financial Markets (Wiley Finance):

13 of 13 people found the following review helpful. A pretty good text on Bayesian adaptive econometric time series

analysis, little relevance to finance or risk managementBy Aaron C. BrownThis book is a pretty good textbook introduction to adaptive Bayesian time series analysis in econometrics. What's strange it that it claims to be a book on financial risk management. If that's your interest, you will be better served by Riccardo Rebonato's A Bayesian Approach to the Analysis of Financial Stress, The Perfect Hedger and the Fox, A Bayesian-Net Approach to Coherent Asset Allocation or Plight of the Fortune Tellers. Those books do not cover the specific mathematics of this one, but they approach the similar issues in financial risk management terms. After reading one or all of them, you might want to buy this one as a text on some of the mathematics involved.The first line in the book is, "Most financial risk models assume that the future will look like the past." Variants of that statement are repeated frequently in the book, without any citation or examples. Of course it's false in the sense the author means it. All modern financial risk models embody some forms of learning and adaptation, and consider the possibility of unprecedented events.In fact adaptive Bayesian techniques are very popular in finance. If the author knows this, why he doesn't discuss how they are used and what their strengths and weaknesses are compared to other modern models? If he doesn't know this, why does he thinks adaptive Bayesian models would work, and why does he think sophisticated financial institutions refuse to adopt them? The book seems to assume everyone is using methods from a 40-year-old Introductory Statistics text.The book does not discuss how any of this analysis would be useful for risk management until the last, and shortest, chapter of the book. Almost all of that chapter is a recapitulation of the early material, only at the end do we get two hints. The first is that when market data deviate from model predictions, "we should either search for better information or trim risk exposures." Of course, this is what people do without risk management. What risk manager would say, "My plan is to wait for unexpected things to happen, then figure them out"? The point of risk management is to have contingency plans for when you can't figure things out.The common term for the second option is "panic". Another point of risk management is to run things at risk levels so you don't have to slash positions at any sign of change (and half the time, those changes mean you make unexpected amounts of money). It's not always practical to cut risk, or obvious how to do it. A lot of problems in 2008 were caused by firms trying to cut risk exposures and ending up making things worse. Moreover, if you are going to adopt this strategy, good risk management practice is to have explicit preset rules for when and how much you will reduce exposures, and this is really important, when you will put the exposures back on.The author's only other risk management suggestion is for senior management to translate strategic instructions in terms of prior distributions. The one example given is instead of saying, try "to be at the top of the league tables for syndicated loans in leveraged buyouts," management should broadcast a prior distribution of leveraged loan performance conditional on latent credit states, and risk takers throughout the firm should use that prior distribution in making decisions.But of course, senior management is not stating an opinion about prior distributions of leveraged loan performance. The leveraged loan desk knows far more about that than senior management. Moreover, management is not telling risk takers to buy and hold leveraged loans, it's telling them to beat out the competition in syndicating them. That has nothing to do with whether or not they are good investments. It's likely a judgement based on beliefs that it is a profitable and fast growing business, that plays to the bank's core competencies, and that will fit in well with other businesses, and serve the bank's customers. Another likely consideration is that the bank has faith in the leverage loan teams, and believes they have the talent and capacity to try for number one. Finally, it is an implicit promise that people will be rewarded for accomplishing the goal, and an implicit threat that the future may be dim for the business heads if they cannot at least come close to the goal.If we forget about risk management and just treat this as a book on how to make short-term estimates of probability distributions in time series, it's still an econometrics text, not a finance book. It's true that the examples are all financial prices, but they are economist prices, not real prices. When making real financial decisions, you consider not just end-of-day prices from the past, you look at intraday prices and a number of indicators of the prices at which you can transact: recent transactions, broker quotes, trader estimates, model prices based on more liquid instruments. It's not that there is a true price and you're uncertain about it, there are a range of prices depending on whether you're buying or selling, and how much; and you're uncertain about all of them. Moreover decisions do not depend only on forecasted short-term price movements, but on liquidity, financing risk, how your trading will affect prices and other factors.An even bigger problem is all the examples concern forecasting a fixed portfolio. If you never trade, there's not much point in forecasting. If the portfolio does change, you have a problem the author ignores. Suppose for example you run a long-short equity momentum portfolio, that is you buy stocks that have gone up recently and short stocks that have gone down, carefully balanced to avoid exposure to the main equity risk factors. If you predict based on the returns on the portfolio, you're making estimates based on the performance of a portfolio you no longer hold. If you instead use the hypothetical past returns of your current positions, your portfolio will always look great; it has to have done well in the past due to the way you constructed it. Adaptive Bayesian methods are still useful, but they have to be set up differently than the author's examples.But the biggest problem is the author treats all financial price movements as random variables, with distributions that can be estimated. But financial prices are sometimes undefined, during liquidity crises, for example, or when markets are closed. Some of the biggest risks occur at these times. Moreover, while the random walk model is powerful, there are other models that must be considered as well. For example, the price of gasoline is related to the price of crude oil, because refiners will adjust behavior if the spread gets too high or

too low. But this is a very complex process with a lot of lags. You can't just have a prior distribution that the price of gasoline will tend to revert to the price of crude oil plus the cost of refining, you need a more sophisticated model. In principle you could marry a deterministic model to an adaptive Bayesian one, but as far as I know no one has, there are some severe problems.Another important way to think about financial prices is in game theory terms. In a short squeeze, for example, people buy hoping to inflict enough losses on short sellers to force them to cover, and push the price up more. Game theory treats uncertainty about the future as choices of rational actors, whose beliefs and preferences are at least partly understood. Adaptive Bayesian methods, if not modified properly, tend to lead to strategies that will be eaten alive by other market participants.The book is well-written and clear, and treats adaptive Bayesian econometric time series models in comprehensive fashion. The math is given, but you don't need to track through the equations to understand the ideas, and there are widely available computer packages for actual implementation. But if you want to apply these in finance, and particularly in financial risk management, this book is only an introduction to the process.

A risk measurement and management framework that takes model risk seriously Most financial risk models assume the future will look like the past, but effective risk management depends on identifying fundamental changes in the marketplace as they occur. Bayesian Risk Management details a more flexible approach to risk management, and provides tools to measure financial risk in a dynamic market environment. This book opens discussion about uncertainty in model parameters, model specifications, and model-driven forecasts in a way that standard statistical risk measurement does not. And unlike current machine learning-based methods, the framework presented here allows you to measure risk in a fully-Bayesian setting without losing the structure afforded by parametric risk and asset-pricing models. Recognize the assumptions embodied in classical statistics Quantify model risk along multiple dimensions without backtesting Model time series without assuming stationarity Estimate state-space time series models online with simulation methods Uncover uncertainty in workhorse risk and asset-pricing models Embed Bayesian thinking about risk within a complex organization Ignoring uncertainty in risk modeling creates an illusion of mastery and fosters erroneous decision-making. Firms who ignore the many dimensions of model risk measure too little risk, and end up taking on too much. Bayesian Risk Management provides a roadmap to better risk management through more circumspect measurement, with comprehensive treatment of model uncertainty.

From the Inside FlapMost financial risk models assume that the future will look like the past. They don't have to. Bayesian Risk Management sketches a more flexible risk-modeling approach that more fully recognizes the irreducibility of our uncertainty about the future. The risk that a firm's models may fail to capture shifts in market pricing, risk sensitivities, or the mix of the firm's risk exposures is a central operational risk for any financial services business. Yet many, if not most, financial services firms lack insight into the probabilistic structure of risk models and the corresponding risk of model failures. The thesis of Bayesian Risk Management is that most firms lack insight into model risk because of the way they practice statistical modeling. Because generally accepted statistical practice provides thin means for assessing model risk, alternative methods are needed to take model risk seriously. Bayesian probability methods are used throughout the book to: Understand the assumptions underlying classical time-series methods and the manner in which they restrict ongoing learning about market conditions Account for the possibility that different risk models may be useful under alternative market conditions, and that model parameters are known imperfectly Allow risk models to adjust continuously to changing market conditions, incorporating varying degrees of memory and coherently revising model estimates from day to day in light of new information Develop and compare alternative online models for single- and multiple-asset volatility Simulate the evolution of state variables and model parameters in dynamic asset pricing models to distinguish market and model risk Ignoring the many dimensions of model risk means measuring too little risk and assuming too much of it. Bayesian Risk Management provides a coherent framework for discerning one's informational advantages and limitations in rapidly-evolving financial markets.From the Back CoverA Risk Measurement and Management Framework that Takes Model Risk Seriously Why do risk models break down? The answer may lie in the way that statistical methods are conventionally used to draw inferences about market conditions and inform risk-taking behavior. Bayesian Risk Management enables a discussion on the way standard statistical methods overlook uncertainty in model specifications, model parameters, and model-driven forecasts. In a simple and direct way, Bayesian methods are used throughout the book to: Recognize the assumptions embodied in classical statistics Quantify model risk along multiple dimensions Model time series without assuming continuity between past and future Adjust time-series estimates to maintain forecast accuracy Uncover uncertainty in workhorse risk and asset-pricing models Achieve decentralized control of risk-taking in complex organizations For firms in financial services and other industries operating in a dynamic environment of incomplete information, Bayesian Risk Management provides a thought-provoking challenge to the prevailing wisdom about the uses and limitations of statistical risk modeling.About the AuthorMATT SEKERKE is an economic consultant based in New York whose work focuses on the financial services industry and the application of advanced quantitative modeling techniques o financial data. He holds a BA in economics and mathematics from The Johns

Hopkins University, an MA in history from The Johns Hopkins University, and an MBA in econometrics and statistics, analytic finance, and entrepreneurship from The University of Chicago Booth School of Business. He is also a CFA charterholder, a certified Financial Risk Manager, and a certified Energy Risk Professional.