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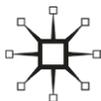
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A Practitioner's Guide to Risk Management

Jawwad Ahmed Farid

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*To Ammi, Aba & Fawzia.
For all the times when you should have said no, but said yes*

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Preface

Models at Work

I am not a Quant.

I always wanted to be one but it took a single meeting with Goldman's Firmwide risk team in London to clear any delusions I may have harbored. All remaining reservations were removed in the one PhD finance elective that I took with Maria Vassalou at Columbia. Despite Maria's kindness and dedication, it was obvious in April 1999 that I was just an ordinary mortal and not a Quant.

In 1999, the realization wasn't heart breaking. Even if one couldn't live in the exotic world of high finance, the less exalted levels in the banking and trading world offered enough to keep you engaged and happy as a professional.

But that was then. The last six years have shown that the impact of quantitative models travels beyond the inner circle of the more mathematically inclined amongst us. Imagine being a board member at a large bank or a financial institution; imagine the board meeting dossier filled with numbers and graphs that come with no cheat sheet or Rosetta Stone and then envisage the need for you, as a board member, to initial and certify it all with your name and reputation.

The challenge is that armed without a PhD in the subject or years of experience on the trading desk we are hopelessly lost when it comes to dissecting models at work. Even if one wants to learn there is little material available in a language that mortals can understand. The foundation of the field of risk management is based on well-aged sciences of mathematics and statistics. It is but natural that books heavy on mathematical and statistical treatment of the subject are common and abundant, while those relying on simple layperson language and do-it-yourself modeling in EXCEL are not.

Ideally, a book should introduce a framework for managing risk and follow it through with a number of real-world illustrative examples with numbers and data. If you are interested, it should allow you to build and test simple models that you can then use to strengthen your understanding of the conditions under which models can break down or predict where things can go wrong. A great text should educate you enough to not only ask the right questions but also evaluate and digest the answers provided.

Over the last decade, as we put together teaching notes for participants in our workshops for bankers, traders, treasurers and executive MBA students, we found that the above design on teaching risk management worked well. The challenge most professionals face is not with theoretical derivations but with practical applications in the real world.

What is this book about?

The book uses four sections to present frameworks, tools, cases and context around risk management. Here is a quick review of each section:

Part I Risk

A framework for thinking about risk begins with an evaluation of complexity in analysis versus complexity in models. The chapters in this section start with an introduction to dealing with volatility, measuring risk using Value at Risk, managing risk using target accounts and ends with two short chapters on risk policy and risk regulation.

Part II Monte Carlo Simulation

A multi-chapter crash course in Monte Carlo Simulation using a simplified approach in EXCEL. We begin with simple simulation models for generating prices for equities, currencies and commodities. The simple models are then used to build a second layer that evaluates the impact of changes in simulated prices on business and performance metrics. Building up on the complexity in analysis themes, while the models used are simple, the objective is to understand relationships that drive the risk distribution.

Part III Fixed Income & Commodity Markets – Dissecting Pricing Models

Armed with frameworks and simple tools, the third section presents an opportunity to apply them. Rather than build models we focus on identifying relationships, drivers and data across commodity markets. Four cases are presented from the point of view of a research analyst. They include:

1. Rolling volatility and correlations in commodity markets
2. Drivers of crude oil and gold pricing
3. The relationship between crude oil price shocks and inflation rates in emerging markets
4. Real interest rates in India and Pakistan

To get the most out of the frameworks and tools presented in the first two sections, each case can be used as the foundation of a more detailed modeling exercise. For example in the two cases that cover drivers behind

crude oil and gold price changes we identify price drivers that are left as black boxes in the case. If you are interested, there is enough data in this section for you to replace the black boxes with your own models.

Part IV Derivative Securities

A text on risk management cannot be complete without a review of the product universe, pricing and valuation models. While a more detailed treatment is available in Hull, Wilmott, Tuckman and Fabozzi, we attempt a short introduction to the product and pricing world to ensure the book remains self-contained for our audience. The decision to add the section was taken once we included the section on Monte Carlo Simulation, since many of the simulations exercises would remain incomplete without product and pricing context.

Who is this book for?

If you are looking for detailed mathematical derivations, differential equations or easy answers, you will be disappointed.

The book is about building intuition around risk and using simple tools to test that intuition against the real world. Taleb calls it “playing with the generator function”. My mentors in the field have called it the “Build, Test, Dissect, Decode” mode of learning. Until you figure out how to break it, you won’t really learn how it works.

The book shows you how to build models, shares the framework that you can use to test and stretch them and in some instances gives you the data to extend them. But it stops short of putting it all together. It will show you the way and partially unlock the door, but you have to make the effort to open it and walk inside.

This book is for you if you ever wondered about risk and its implications in the real world; if you wanted to model risk but felt awed by the terminology; if you like to question assumptions and test them; if your board is a “What if” board and you want to put a better process around their troubling questions; and if you wanted to be a quant, but like me, are not.

Happy reading.

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Any mistakes and errors remain mine.

About the Author

Jawwad Ahmed Farid has been building, selling and implementing risk models since 1999. Working with clients on four continents he has helped bankers, boards and regulators take a more practical approach to risk management.

He runs Alchemy Technologies, a risk consulting practice and writes about risk and treasury products at FinanceTrainingCourse.com. When he is not travelling for work he teaches risk and derivative pricing at the SP Jain School of Global management in Dubai and Singapore. Jawwad has an undergraduate degree in Computer Science from FAST ICS, an MBA from Columbia Business School and is a Fellow of the Society of Actuaries.