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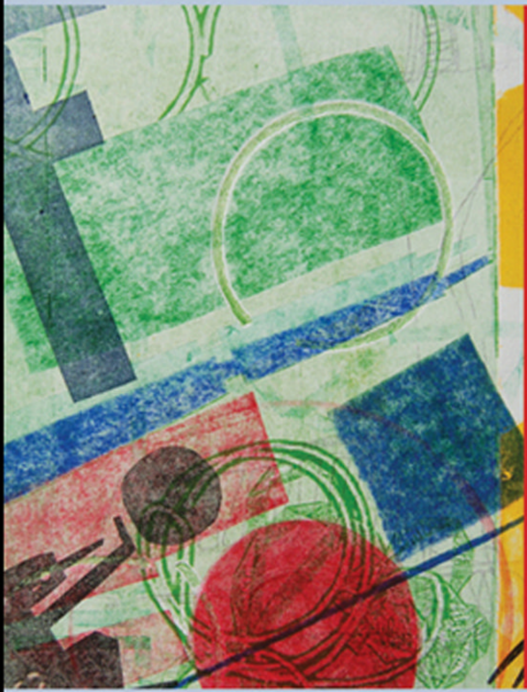

Financial RISK Management

Models, History, and Institutions

ALLAN M. MALZ

Financial Risk Management

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ALLAN M. MALZ

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
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Library of Congress Cataloging-in-Publication Data:

Malz, Allan M.
Financial risk management: models, history, and institution : models, history, and institution / Allan M. Malz.
p. cm. – (Wiley finance series)
Includes bibliographical references and index.
ISBN 978-0-470-48180-6 (cloth); ISBN 978-1-118-02291-7 (ebk);
ISBN 978-1-118-02290-0 (ebk); ISBN 978-1-118-02289-4 (ebk)
1. Financial risk management. I. Title.
HD61.M256 2011
332–dc22 2010043485

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

To
Karin, Aviva, and Benjamin
with love

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Preface

Financial Risk Management started as one thing and has ended as another. I took up this project with the primary aim of making risk measurement and management techniques accessible, by working through simple examples, and explaining some of the real-life detail of financing positions. I had gotten fairly far along with it when the subprime crisis began and the world changed.

I had already begun to appreciate the importance of liquidity and leverage risks, which are even harder to measure quantitatively than market and credit risks, and therefore all the more important in practice. In the subprime crisis, liquidity and leverage risks were dominant. Had the subprime crisis never occurred, they would have had an honorable place in this text. After the crisis erupted, it became hard to think about anything else. To understand why liquidity and leverage are so important, one needs to understand the basic market and credit risk models. But one also needs to understand the institutional structure of the financial system.

One aim of *Financial Risk Management* is therefore to bring together the model-oriented approach of the risk management discipline, as it has evolved over the past two decades, with economists' approaches to the same issues. There is much that quants and economists can learn from one another. One needs to understand how financial markets work to apply risk management techniques effectively.

A basic aim of the book is to provide some institutional and historical context for risk management issues. Wherever possible, I've provided readers with data from a variety of public- and private-sector sources, for the most part readily accessible by practitioners and students. One of the blessings of technology is the abundance of easily obtainable economic and financial data. The particular phenomena illustrated by the data in the figures are important, but even more so familiarity with data sources and the habit of checking impressions of how the world works against data.

Some themes are developed across several chapters, but can be read in sequence for a course or for individual study:

- Recent financial history, including postwar institutional changes in the financial system, developments in macroeconomic and regulatory policy, recent episodes of financial instability, and the global financial crisis are the focus of all or part of Chapters 1, 9, 11, 12, 14, and 15.
- Market risk is studied in Chapters 2 through 5 on basic risk models and applications. Chapter 7 discusses spread risk, which connects market and credit risks, Chapter 11 discusses model validation, and Chapters 12 through 15 discuss liquidity risk, risk capital, the behavior of asset returns during crises, and regulatory approaches to market risk.
- Credit risk is studied in Chapters 6 through 9, which present basic concepts and models of the credit risk of single exposures and credit portfolios, and in Chapters 11, 12, and 15, which study credit risk in the context of leverage, liquidity, systemic risk and financial crises.
- Structured credit products and their construction, risks, and valuation, are the focus of Chapter 9. Chapter 11 continues the discussion of structured credit risk, while Chapters, 12, 14, and 15 discuss the role of structured products in collateral markets and in financial system leverage.
- Risk management of options is developed in Chapters 4 and 5 in the context of nonlinear exposures and portfolio risk. Chapter 14 discusses the role of option risk management in periods of financial stress.
- Extraction of risk measures based on market prices, such as risk-neutral return and default probabilities and equity and credit implied correlations, is studied in Chapters 7, 9 and 10, and applied in Chapters 1, 11, and 14.

Financial Risk Management is intermediate in technical difficulty. It assumes a modicum, but not a great deal, of comfort with statistics and finance concepts. The book brings a considerable amount of economics into the discussion, so it will be helpful if students have taken an economics course.

Each chapter contains suggestions for further reading. Most of the texts cited provide alternative presentations or additional detail on the topics covered in *Financial Risk Management*. Some of them treat topics that couldn't be covered adequately in this book, or in some way take the story further. Others are suggested basic readings on statistics, finance, and economics.

I've had the good fortune of working with wonderful, smart people for the past quarter-century. The Federal Reserve System is home to some of the brightest and most hardworking people I've known, and the citizenry is

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