

Credit Portfolio
Management

CHARLES SMITHSON



John Wiley & Sons, Inc.

Preface

Like its sister book, *Managing Financial Risk* (which deals with market risk), this book evolved from a set of lecture notes. (My colleagues at Rutter Associates and I have been teaching classes on credit portfolio management to bankers and regulators for almost four years now.) When lecture notes get mature enough that they start curling up on the edges, the instructor is faced with a choice—either throw them out or turn them into a book. I chose the latter.

The good news about writing a book on credit portfolio management is that it is topical—credit risk is the area that has attracted the most attention recently. The bad news is that the book will get out of date quickly. In the credit market, tools, techniques, and practices are changing rapidly and will continue to change for several years to come. We will try our best to keep the book current by providing updates on our website. Go to www.rutterassociates.com and click on the *Credit Portfolio Management* book icon.

A number of people have contributed to this book. In particular, I want to acknowledge my colleagues at Rutter Associates—Paul Song and Mattia Filiaci. Without them, this book would never have been completed.

This book benefited greatly from my involvement with the newly formed International Association of Credit Portfolio Managers (IACPM). I learned a lot from conversations with the founding board members of that organization: Stuart Brannan (Bank of Montreal); John Coffey (JP Morgan Chase); Gene Guill (Deutsche Bank); Hetty Harlan (Bank of America); Loretta Hennessey (CIBC); Charles Hyle (Barclays Capital); Paige Kurtz (Bank One); Ed Kyritz (UBS); Robin Lenna (at Citibank at the time, now at FleetBoston Financial); and Allan Yarish (at Royal Bank of Canada at the time, now at Société Générale).

For their contributions to and support for the 2002 Survey of Credit Portfolio Management Practices, I want to thank Stuart Brannan (IACPM and Bank of Montreal), David Mengle (ISDA), and Mark Zmiewski (RMA).

Colleagues who contributed knowledge and material to this book include:

Michel Araten, JP Morgan Chase
Marcia Banks, Bank One
Brooks Brady, Stuart Braman, Michael Dreher, Craig Friedman, Gail
Hessol, David Keisman, Steven Miller, Corinne Neale, Standard &
Poor's Risk Solutions
Susan Eansor and Michael Lavin, Loan Pricing Corporation
Chris Finger, RiskMetrics Group
Robert Haldeman, Zeta Services
David Kelson and Mark McCambley, Fitch Risk Management
Susan Lewis, Credit Sights
Robert Rudy, Moody's-KMV
Rich Tannenbaum, SavvySoft

A special thank-you is due to Beverly Foster, the editor of the *RMA Journal*, who convinced me to write a series of articles for her journal. That series formed the first draft of many of the chapters in this book and was the nudge that overcame my inertia about putting pen to paper.

Finally, as always, my biggest debt is to my wife, Cindy.

CHARLES SMITHSON
Rutter Associates

New York, New York
November 2002

Contents

CHAPTER 1

The Revolution in Credit—Capital Is the Key	1
The Credit Function Is Changing	1
Capital Is the Key	6
Economic Capital	8
Regulatory Capital	11
APPENDIX TO CHAPTER 1: A Credit Portfolio Model Inside the IRB Risk Weights	21
Note	23

PART ONE

The Credit Portfolio Management Process **25**

CHAPTER 2

Modern Portfolio Theory and Elements of the Portfolio Modeling Process	27
Modern Portfolio Theory	27
Challenges in Applying Modern Portfolio Theory to Portfolios of Credit Assets	34
Elements of the Credit Portfolio Modeling Process	38
Note	40

CHAPTER 3

Data Requirements and Sources for Credit Portfolio Management	41
Probabilities of Default	41
Recovery and Utilization in the Event of Default	92
Correlation of Defaults	102
Notes	107

CHAPTER 4	
Credit Portfolio Models	109
Structural Models	110
Explicit Factor Models	133
Actuarial Models	141
Analytical Comparison of the Credit Portfolio Models	148
Empirical Comparison of the Credit Portfolio Models	153
What Models Are Financial Institutions Using?	161
Notes	161
APPENDIX TO CHAPTER 4: Technical Discussion of Moody's–	
KMV <i>Portfolio Manager</i> <i>Mattia Filiaci</i>	162
Default Correlation	162
Facility Valuation	163
Generating the Portfolio Value Distribution	174
Outputs	176
Notes	178
PART TWO	
<hr/>	
Tools to Manage a Portfolio of Credit Assets	181
CHAPTER 5	
Loan Sales and Trading	183
Primary Syndication Market	183
Secondary Loan Market	191
Note	192
CHAPTER 6	
Credit Derivatives <i>with Gregory Hayt</i>	193
Taxonomy of Credit Derivatives	193
The Credit Derivatives Market	201
Using Credit Derivatives to Manage a Portfolio of Credit Assets	203
Pricing Credit Derivatives	209
Notes	224
CHAPTER 7	
Securitization	225
Elements of a CDO	225
“Traditional” and “Synthetic” CDO Structures	229
Applications of CDOs	233

To What Extent and Why Are Financial Institutions Using Securitizations?	236
Regulatory Treatment	237
Note	240
PART THREE	
Capital Attribution and Allocation	241
CHAPTER 8	
Capital Attribution and Allocation	243
Measuring Total Economic Capital	243
Attributing Capital to Business Units	247
Attributing Capital to Transactions	252
Performance Measures—The Necessary Precondition to Capital Allocation	258
Optimizing the Allocation of Capital	267
Notes	269
APPENDIX TO CHAPTER 8: Quantifying Operational Risk	270
Process Approaches	274
Factor Approaches	274
Actuarial Approaches	275
Notes	276
APPENDIX	
Statistics for Credit Portfolio Management <i>Mattia Filiaci</i>	277
Basic Statistics	278
Applications of Basic Statistics	306
Important Probability Distributions	314
Notes	324
References	327
Index	333