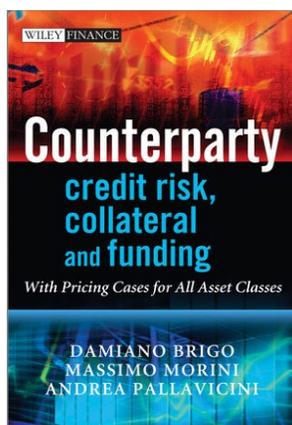


Review of the book

Credit Risk, Collateral and Funding: With Pricing Cases For All Asset Classes

by Damiano Brigo, Massimo Morini and Andrea Pallavicini, Wiley, 2013



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“There is no easy way out...”

...would be the main message and is, in fact, a refrain² in the book, referring to the intrinsic complexity of post-crisis financial markets, particularly with nonlinear funding costs that break the law of one price and make value “holistic” (as they say), only well-defined at the global portfolio level. Like a “microscope”, “the crisis has transformed irrelevant details into crucial points, and in changing the scale of observation it has forced us to change our whole approach to the problem” (Alice says page 412; see also page 262). This is one of the first books about post-crisis finance involving a top academic and that’s important. This being said, the authors are not revolutionaries. In fact, on page 362 they write “Our approach offers a clear explanation of the fact that we do not need to change the pricing theory, that remains the classical risk neutral theory, to account for funding costs. Our key message is that one does not need to change the theory but just the payout”. I happen to share similar view, as indicated in one of my papers.

The book is a good illustration of how mathematics can be efficiently applied to real problems. In fact, in this case, it’s even mathematics coming from the market, since most developments of the theory presented in the book were directly inspired by the evolution of financial markets in

¹ The reviewer thanks Tomasz R. Bielecki for exchanges on a preliminary version of this report.

² Repeated on pages 267, 317, 330, 351 and 414 at least (starting from the point where I began to take note of it).

the recent decade, and especially after the credit crisis of 2008-2010. The authors have pioneered many of these developments. Listing only three: the understanding of CVA as an option with the corresponding 'CCDS pricing formula', the ensuing possibility of properly accounting for wrong-way risk, the use of 'American Monte Carlo' or least-square regression in this context (see page 128). So, the volume by Brigo et al. may also be seen as an excellent testimony to the progression of the science of quantitative finance, and this alone provides a good justification for this book.

I have found it to be quite convenient and instructive that the book provides appropriately updated synthesis of about ten years of works of what one could call the new "Scuola di Milano" (the previous one was a philosophical trend at the beginning of the XXth century), 'founded' by Damiano Brigo at Banca IMI in the early 2000's. Consistent with the tradition of their research methodology the authors have organized a good part of the book according to various financial products categories, which is probably good for readers from the industry. This includes counterparty risk on interest rates, commodities, equities, FX and longevity. With regards to the credit models that are used, these are mainly the reduced form (intensity) models, but occasionally also structural models. Notably, the latter ones are used in Chapter 8 for inducing an endogenous equity model that can be used for capital structure arbitrage applications. There are numerous numerical illustrations provided throughout the book. Typically, genuine market data are used for this purpose. The book touches upon the more recent and even tentative and/or prospective market developments, including discussions about CCDS, novation, margin lending and CCPs.

The book is also useful in conveying some important messages that underlie the main motif of the book mentioned above. Among the most important I would count the messages regarding: the danger of simplistic approaches coupled with ad-hoc and allegedly conservative 'multipliers' (page 148), model and payoff risk, gap risk that can make collateralization much less effective than it seems, etc. (see the list on page 266 and the initial and final dialogues).

Given the way the book is written, there is hope that it will help to disseminate knowledge to a wider audience and break the walls between chapels like, for instance, mathematical finance and financial economics ("you need a lot of skills in our job", Alice says on page 411). One thing that strikes me is that, in spite of the clear risk-neutral pricing positioning of the book, proper dynamic developments arrive so late, only really starting in chapters 15 and 17. This may reflect the fact that the industry today does not have a truly dynamic perspective, only assessing risk in terms of bump-sensitivities. It brings to mind what Prof. Nicole El Karoui once told me: maybe this is the drama of Black-Scholes that the dynamic delta of an option is given as the derivative of the pricing function. One could thus think that the issue of hedging should be more central in the book. But, in fact, there is another book that has just been published³ more in this perspective, and Damiano Brigo is also involved in it, so we are fine!

³ *Counterparty Risk and Funding—A Tale of Two Puzzles* (S. Crépey and T. Bielecki, with an introductory dialogue by D. Brigo, Chapman & Hall/CRC Financial Mathematics Series, June 2014)