BOOK REVIEW

Interest Rate Models: An Introduction by AJG Cairns, ISBN 0691118949, Princeton University Press, Princeton (2004), 288 pages

Financial mathematics has developed rapidly over the last few decades. There are several books that cover the subject of interest-rate modelling. Current literature ranges vastly in comprehensiveness and complexity and this has made it difficult for a reader to source material that has the required level of detail for their purposes. This is the first textbook that brings together a considerable range of work from textbooks and financial and actuarial journals on a consistent level of theoretical development. As such, it can serve as a useful reference to readers interested in interest-rate modelling.

In the preface, Cairns writes:

> the origin of this book lies within a graduate-level course on bond pricing … [and] is aimed at people who are just starting to learn the subject of interest rate modelling

Readers who are familiar with the topic will be interested in the second half of the book, which deals with more advanced and recent topics.

The book starts with an overview of the different types of bonds, general interest-rate theories and bond pricing. The binomial model is introduced and is used to familiarise readers with some core concepts of interest-rate modelling. This is extended in a logical fashion to the different developments in continuous-time interest-rate modelling. The book covers a broad range of approaches that are currently in existence. This includes the Vasicek and Cox-Ingersoll-Ross models (which are part of the syllabus for subject 109 of the examinations of the Faculty and Institute of Actuaries) as well as the no-arbitrage framework, which forms the basis for several models currently used by practitioners.

Each chapter starts with a concise introduction to the topic that will be dealt with and this is well laid out. The subject is rapidly developed from basic definitions in an easy-to-follow manner. This makes it suitable for a wide readership. Each chapter concludes with exercises so that the reader can consolidate their gained knowledge.

The reader is required to have a good mathematical and statistical background to follow the development of the book. Cairns pitches it so that it contains sufficient technical detail to enable readers to develop and apply their knowledge without getting bogged down. For those wanting the technical rigour, the key mathematical and statistical tools and proofs are shown in appendices. Thanks to this structure the book appeals to a larger readership than might otherwise be the case.

Cairns briefly introduces the modelling of credit risk. He refers to relevant papers by other authors where further development of the particular topic is beyond the scope of his book. These references are very useful for readers who want to explore this rapidly growing field in more depth.

Extensive references throughout the book to other and more advanced texts, and an

extensive and varied bibliography, make it a good introduction and reference book on interest-rate modelling. Comments on reality and market practice differentiate it from a purely academic textbook and make it useful to practitioners as well.

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