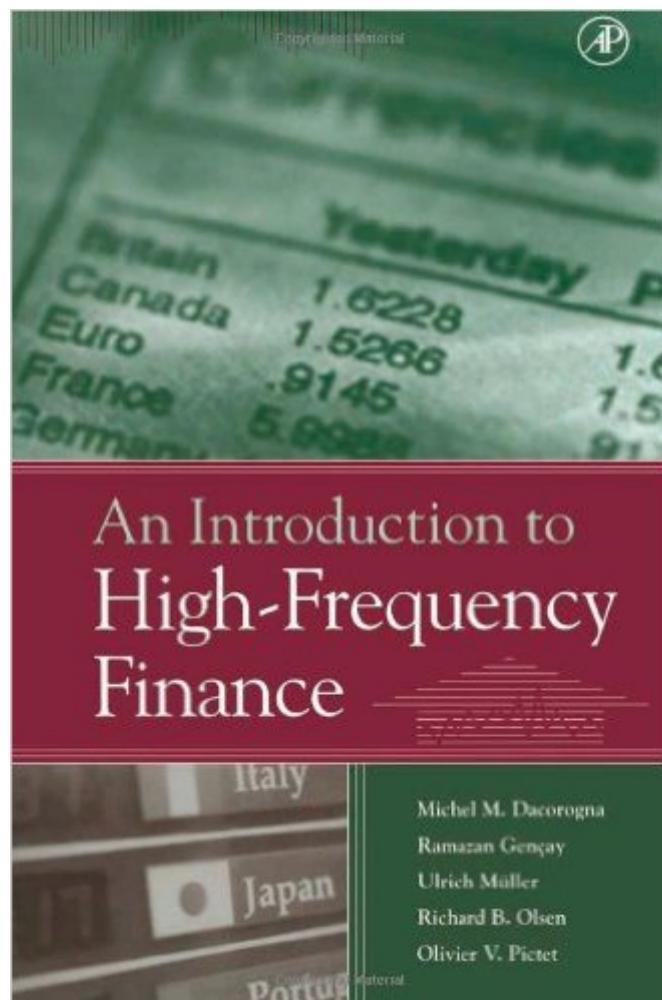


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# An Introduction To High-Frequency Finance



## Synopsis

Liquid markets generate hundreds or thousands of ticks (the minimum change in price a security can have, either up or down) every business day. Data vendors such as Reuters transmit more than 275,000 prices per day for foreign exchange spot rates alone. Thus, high-frequency data can be a fundamental object of study, as traders make decisions by observing high-frequency or tick-by-tick data. Yet most studies published in financial literature deal with low frequency, regularly spaced data. For a variety of reasons, high-frequency data are becoming a way for understanding market microstructure. This book discusses the best mathematical models and tools for dealing with such vast amounts of data. This book provides a framework for the analysis, modeling, and inference of high frequency financial time series. With particular emphasis on foreign exchange markets, as well as currency, interest rate, and bond futures markets, this unified view of high frequency time series methods investigates the price formation process and concludes by reviewing techniques for constructing systematic trading models for financial assets.

## Book Information

Hardcover: 383 pages

Publisher: Academic Press; 1 edition (May 14, 2001)

Language: English

ISBN-10: 0122796713

ISBN-13: 978-0122796715

Product Dimensions: 6 x 0.9 x 9 inches

Shipping Weight: 1.5 pounds (View shipping rates and policies)

Average Customer Review: 4.1 out of 5 stars Â See all reviews Â (8 customer reviews)

Best Sellers Rank: #178,060 in Books (See Top 100 in Books) #60 in Â Books > Business & Money > Skills > Business Mathematics #76 in Â Books > Business & Money > Economics > Econometrics #126 in Â Books > Textbooks > Business & Finance > Investments & Securities

## Customer Reviews

This one of the few books on high frequency finance is a most welcome to the literature. The book is useful not only for people who are new to the subject but also for researchers in the field since it is a most uniform treatment of many topics. From adaptive data cleaning (chapter 4) to intraday and weekly seasonality (chapter 6) and real time trading models (chapter 11), it covers a broad range of topics specific to high frequency financial time series analysis. Chapters on volatility modeling (Chapter 8), forecasting (chapter 9) and correlation and multivariate risk (chapter 10) are

enlightening especially for risk exposure analysis and risk management purposes. Finally, the the extensive bibliography is a precious source for those who would like to explore certain topics in detail. I highly recommend it for practitioners as well as researchers in the field.

Michel Dacorogna and the team at the former Olsen & Associates are well-known experts in the field of foreign exchange rate data analysis, and their book provides us with a vast, useful source of information. Unfortunately for students and other beginners, the book is written like a compilation of papers and review articles, the opposite of pedagogical, and with an awful choice of 'computerese' notation ( $MA(t,n)=\text{sum}(EMA(t',k), \dots)$  etc) that makes Boudhaud-Potters look easy in comparison. More to the point, even their noncomputerese notation is difficult to follow. I hope for a very different second edition written pedagogically for students of this growing and important field. On the positive side, data analyses are performed using logarithmic returns, not price increments. Workers in the field who consult this text will find it helpful.

This book doesn't deal with true high-frequency trading, where it is more about execution than anything else. The book IS ten years old when I write this, so high frequency trading has taken on a different meaning, so no false advert here. That said, it is a great treatment of the practical issues of handling large, heterogeneous financial data sets and their statistics. I haven't seen their methodology and framework anywhere else, although there are some really good treatments of irregularly spaced financial data (Hautsch, Engle). The authors are prolific in this area, in particular, the use of tick data to build better volatility models and the use of seasonality (business time scale) and stochastic time (see intrinsic time). They also present a good way to use higher frequency homogeneous data to effectively filter historical volatility computations that makes them more robust when the data is interpolated or sparse. The best part is that they bring everything together for use in multivariate cases and for forecasting/trading. Overall, this is a great book, that doesn't have many peers (if any). I can't recommend it enough. Minor downsides: (1) I also agree with the other reviewers on the notation, although it doesn't bother me that much personally. (2) Would be nice to see some type of flowchart for an implementation of the methods in Ch. 6 and later, like they did in Ch. 4. (3) No explicit mention of duration and/or point processes, although it is implicit in many of their techniques. This one might be a little unfair because one can't expect the authors to survey the entire body of literature.

There are some useful results in this book. It has an especially good section on statistical

techniques for data cleanup and making sure you have a clean tick series. Also, there are some interesting pieces on how to handle the discontinuous nature of tick data as opposed to what you see with daily data. Unfortunately, the book is written in a style that is hard to follow so that even standard results seem somewhat obscure the way the authors present them. Also, the notation is a pain, as noted by other reviewers they use a kind of computer notation rather than standard statistical notation making many of the formulae much more difficult to read than they should be. Overall, a good book but it suffers from a poor writing style and is getting to be somewhat dated.

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