Wiley Handbooks in
FINANCIAL ENGINEERING AND ECONOMETRICS

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The dynamic and interaction between financial markets around the world have changed dramatically under economic globalization. In addition, advances in communication and data collection have changed the way information is processed and used. In this new era, financial instruments have become increasingly sophisticated and their impacts are far-reaching. The recent financial (credit) crisis is a vivid example of the new challenges we face and continue to face in this information age. Analytical skills and ability to extract useful information from mass data, to comprehend the complexity of financial instruments, and to assess the financial risk involved become a necessity for economists, financial managers, and risk management professionals. To master such skills and ability, knowledge from computer science, economics, finance, mathematics and statistics is essential. As such, financial engineering is cross-disciplinary, and its theory and applications advance rapidly.

The goal of this Handbook Series is to provide a one-stop source for students, researchers, and practitioners to learn the knowledge and analytical skills they need to face today's challenges in financial markets. The Series intends to introduce systematically recent developments in different areas of financial engineering and econometrics. The coverage will be broad and thorough with balance in theory and applications. Each volume will be edited by leading researchers and practitioners in the area and covers state-of-the-art methods and theory of the selected topic.

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Preface

This handbook is a collection of articles that describe current empirical and analytical work on data sampled with high frequency in the financial industry.

In today’s world, many fields are confronted with increasingly large amounts of data. Financial data sampled with high frequency is no exception. These staggering amounts of data pose special challenges to the world of finance, as traditional models and information technology tools can be poorly suited to grapple with their size and complexity. Probabilistic modeling and statistical data analysis attempt to discover order from apparent disorder; this volume may serve as a guide to various new systematic approaches on how to implement these quantitative activities with high-frequency financial data.

The volume is split into three distinct parts. The first part is dedicated to empirical work with high frequency data. Starting the handbook this way is consistent with the first type of activity that is typically undertaken when faced with data: to look for its stylized features. The book’s second part is a transition between empirical and theoretical topics and focuses on properties of long memory, also known as long range dependence. Models for stock and index data with this type of dependence at the level of squared returns, for instance, are coming into the mainstream; in high frequency finance, the range of dependence can be exacerbated, making long memory an important subject of investigation. The third and last part of the volume presents new analytical and simulation results proposed to make rigorous sense of some of the difficult modeling questions posed by high frequency data in finance. Sophisticated mathematical tools are used, including stochastic calculus, control theory, Fourier analysis, jump processes, and integro-differential methods.

The editors express their deepest gratitude to all the contributors for their talent and labor in bringing together this handbook, to the many anonymous referees who helped the contributors perfect their works, and to Wiley for making the publication a reality.

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