

### Mathematical Methods for Foreign Exchange: A Financial Engineer's Approach

By Alexander Lipton



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This comprehensive book presents a systematic and practically oriented approach to mathematical modeling in finance, particularly in the foreign exchange context. It describes all the relevant aspects of financial engineering, including derivative pricing, in detail. The book is self-contained, with the necessary mathematical, economic, and trading background carefully explained. In addition to the lucid treatment of the standard material, it describes many original results.

The book can be used both as a text for students of financial engineering, and as a basic reference for risk managers, traders, and academics.

#### **Contents:**

- Introduction:
  - Foreign Exchange Markets
- Mathematical Preliminaries:
  - $\circ$  Elements of Probability Theory
  - Discrete-Time Stochastic Engines
  - Continuous-Time Stochastic Engines
- Discrete-Time Models:
  - Single-Period Markets
  - Multi-Period Markets
- Continuous-Time Models:
  - Stochastic Dynamics of Forex
  - European Options: The Group-Theoretical Approach
  - European Options, the Classical Approach
  - Deviations from the Black-Scholes Paradigm I: Nonconstant Volatility
  - American Options
  - Path-Dependent Options I: Barrier Options
  - Path-Dependent Options II: Lookback, Asian and other Options
  - Deviations from the Black-Scholes Paradigm II: Market Frictions
  - Future Directions of Research and Conclusions

Readership: Financial engineering students, risk managers, traders and

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#### From the Publisher

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#### About the Author

Alexander Lipton, PhD, is a Director in the Global Foreign Exchange Division at Deutsche Bank and an Adjunct Professor of Mathematics at the University of Illinois. In addition to Mathematical Methods for Foreign Exchange, he is the author of one other book, as well as numerous research papers and technical reports on financial engineering and applied mathematics. In January 2000, Dr Lipton became the first recipient of the prestigious Quant of the Year Award by the Magazine Risk.

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