Chapter 1: Overview of Financial Analysis with Python

The world’s most powerful data lives on Quandl.

The premier source for financial, economic, and alternative datasets, serving investment professionals. Quandl’s platform is used by over 250,000 people, including analysts from the world’s top hedge funds, asset managers and investment banks. More on what we do.

Alternative Data
We bring undiscovered data from non-traditional publishers to investors seeking unique, predictive insights. We leverage exclusive relationships to deliver these alpha-generating datasets to our customers.

Core Financial Data
Quandl delivers market data from hundreds of sources via API, or directly into Python, R, Excel and many other tools. Get the data you need in the format you want.

Corporate Aviation Intelligence
Track corporate air travel to yield immediate and actionable insight into M&A and other corporate activity.
Chapter 2: The Importance of Linearity in Finance
Chapter 3: Nonlinearity in Finance

![Graph showing implied volatility vs. strike price (K) with ITM, ATM, and OTM labels.](image)
Chapter 4: Numerical Methods for Pricing Options
\[ f_{i+1,j} \]

\[ f_{i,j} \]

\[ f_{i-1,j} \]

\[ f_{i,j+1} \]

\[ \alpha_i = \frac{dt}{4}(\sigma^2 i^2 - ri) \]

\[ \beta_i = \frac{dt}{2}(\sigma^2 i^2 + ri) \]

\[ \gamma_i = \frac{dt}{4}(\sigma^2 i^2 + ri) \]
Chapter 5: Modeling Interest Rates and Derivatives

yield

maturity
Zero Coupon Bond (ZCB) Values by Time

Value ($) vs. Time in years
Zero Coupon Bond (ZCB) and Strike (K) Values by Time
Callable Zero Coupon Bond Values by $r$

- **1 yr**
- **5.0 yr**
- **7.0 yr**
- **10.0 yr**
- **20.0 yr**

![Callable Zero Coupon Bond Values by $r$](image)
Chapter 6: Statistical Analysis of Time Series Data
Chapter 7: Interactive Financial Analytics with the VIX
\[ VIX = 100 \times \sqrt{\left\{ T_1 \sigma_1^2 \left[ \frac{N_{T_2} - N_{30}}{N_{T_2} - N_{T_1}} \right] + T_2 \sigma_2^2 \left[ \frac{N_{30} - N_{T_1}}{N_{T_2} - N_{T_1}} \right] \right\} \times \frac{N_{365}}{N_{30}}} \]
Chapter 8: Building an Algorithmic Trading Platform

Probability distribution of portfolio returns

Worst 5% returns

negative returns  95th percentile  0%  positive returns
Chapter 9: Implementing a Backtesting System
Chapter 10: Machine Learning for Finance

JPM prediction by OLS

[Graph showing actual and predicted JPM values from 2018-01 to 2019-01]
Chapter 11: Deep Learning for Finance

![Diagram of a neural network with input layer, hidden layers, and output layer.]
Actual and predicted prices of AAPL 2018