

Contents

1	Introduction	1
2	Price Dynamics of Leveraged ETFs	7
2.1	Returns of Leveraged ETFs	7
2.2	Continuous-Time Model for Leveraged ETFs	10
2.3	Empirical Leverage Ratio Estimation	14
2.4	Dynamic Leveraged Futures Portfolio	22
2.4.1	Static Leverage Replication	24
2.4.2	Dynamic Leverage Replication	28
2.5	Static Delta-Neutral Long-Volatility LETF Portfolios	31
3	Risk Analysis of Leveraged ETFs	37
3.1	Admissible Leverage Ratio	38
3.2	Admissible Risk Horizon	43
3.3	Intra-Horizon Risk and Stop-Loss Exit	45
4	Options on Leveraged ETFs	51
4.1	Empirical Returns of LETF Options	51
4.2	Implied Dividend	59
4.3	Implied Volatility	62
4.4	Pricing Under Heston Stochastic Volatility	65
4.5	Model Calibration and Consistency	69
4.6	Moneyiness Scaling	75
4.7	Incorporating Jumps with Stochastic Volatility	79

5	Conclusions	89
	References	93
	Index	97

Leveraged Exchange-Traded Funds

Price Dynamics and Options Valuation

Leung, T.; Santoli, M.

2016, X, 97 p. 32 illus. in color., Softcover

ISBN: 978-3-319-29092-8