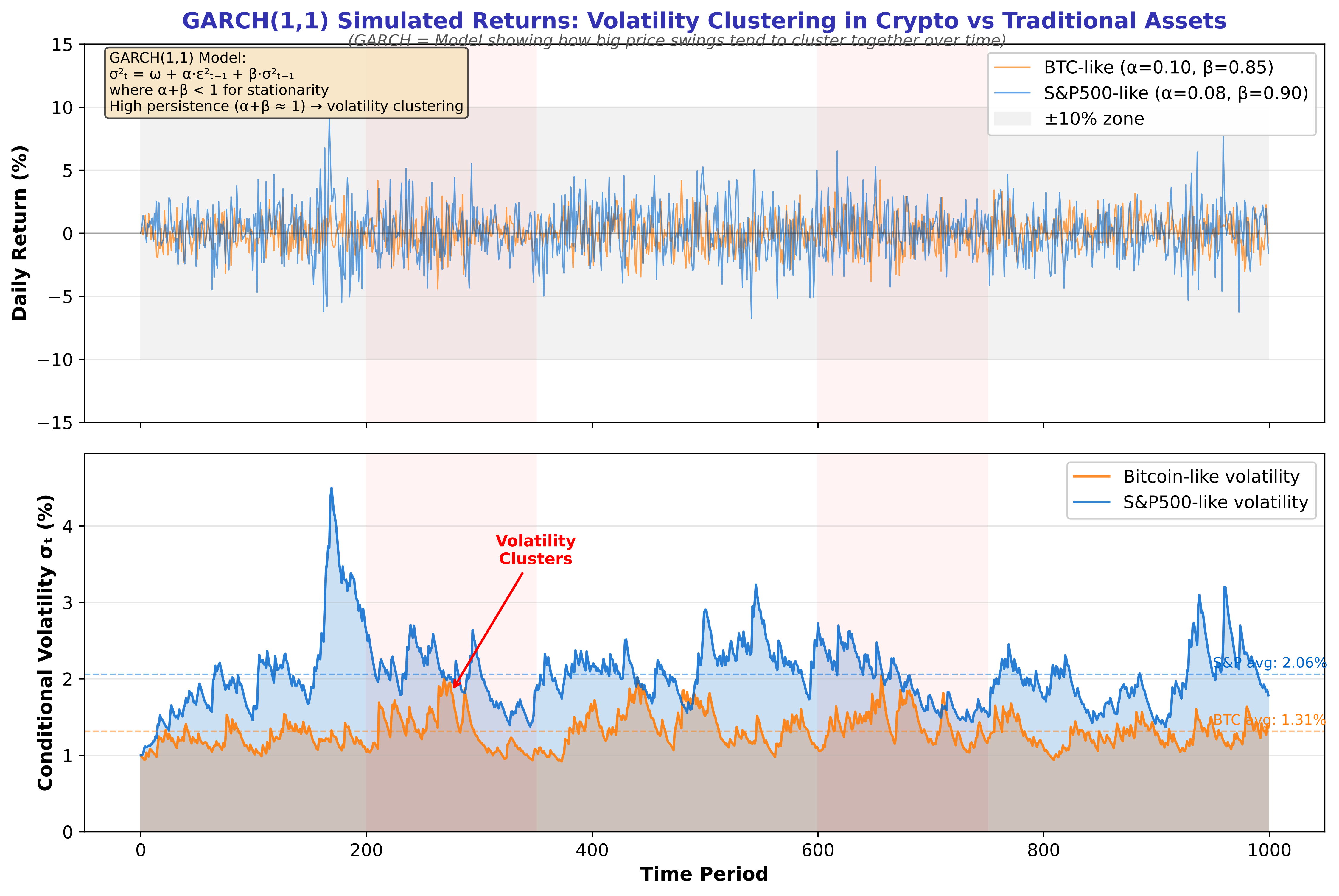
GARCH(1,1) Simulated Returns: Volatility Clustering in Crypto vs Traditional Assets
(GARCH = Model showing how big price swings tend to cluster together over time)
GARCH(1,1) Model:
$\sigma^2_t = \omega + \alpha \cdot \varepsilon^2_{t-1} + \beta \cdot \sigma^2_{t-1}$
where α+β < 1 for stationarity
High persistence (α+β ≈ 1) → volatility clustering
BTC-like (α=0.10, β=0.85)
S&P500-like (α=0.08, β=0.90)
±10% zone
Daily Return (%)
Volatility Clusters
Bitcoin-like volatility
S&P500-like volatility
S&P avg: 2.06%
BTC avg: 1.31%
Conditional Volatility σ_t (%)
Time Period
15
10
5
0
−5
−10
−15
4
3
2
1
0
200
400
600
800
1000