



# Statistics of Financial Markets

## Chapter 12: Crypto and Stablecoins



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# Outline

Motivation

Cryptocurrency Markets

Bitcoin and Altcoins

Stablecoins

Statistical Properties of Crypto Returns

Applications

Conclusions

References

## Motivation

- The emergence of digital assets as a new asset class
- Statistical challenges posed by cryptocurrency markets
- Relevance for portfolio diversification and risk management

## Cryptocurrency Markets

- Overview of the cryptocurrency ecosystem
- Market microstructure: exchanges, order books, liquidity
- 24/7 trading and its implications for volatility modeling
- Market capitalization and trading volume dynamics

## Bitcoin and Altcoins

- Bitcoin as the benchmark cryptocurrency
- Major altcoins: Ethereum, Ripple, Litecoin
- Return and volatility characteristics
- Cross-cryptocurrency correlations and co-movements

## Stablecoins

- ▣ Definition and purpose of stablecoins
- ▣ Types: fiat-collateralized (USDT, USDC), crypto-collateralized (DAI), algorithmic
- ▣ Peg stability analysis and de-pegging events
- ▣ Terra/Luna collapse: a case study

## Statistical Properties of Crypto Returns

- ▣ Distribution of cryptocurrency returns: extreme heavy tails
- ▣ Volatility clustering and long memory in crypto markets
- ▣ Comparison of stylized facts: crypto vs. traditional assets
- ▣ Bubble detection and regime switching

## Applications

- ▣ Volatility modeling for Bitcoin using GARCH-type models
- ▣ Stablecoin peg deviation analysis
- ▣ Portfolio optimization with crypto assets
- ▣ Python implementation for crypto data retrieval and analysis



## Conclusions

- ▣ Summary of crypto market characteristics and stablecoin dynamics
- ▣ Challenges for statistical modeling in crypto markets
- ▣ Future directions and regulatory developments

## References

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