



Statistics of Financial Markets

Chapter 6: Empirical Observations of Capital Markets



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Outline

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Heavy Tails

Volatility Clustering

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Long Memory

Aggregational Gaussianity

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References

Motivation

- ▣ Stylized facts as universal empirical regularities of financial returns
- ▣ Why Gaussian models fail to capture real market behavior
- ▣ Importance for risk management and derivative pricing

Heavy Tails

- ▣ Excess kurtosis in financial return distributions
- ▣ QQ-plots and tail index estimation
- ▣ Comparison with the normal distribution
- ▣ Power-law behavior in the tails

Volatility Clustering

- “Large changes tend to be followed by large changes” (Mandelbrot, 1963)
- Autocorrelation of squared and absolute returns
- Visual evidence from financial time series
- Motivation for GARCH-type models

Leverage Effect

- ▣ Asymmetric response of volatility to positive and negative shocks
- ▣ Black's (1976) leverage hypothesis
- ▣ News impact curves
- ▣ Empirical evidence across asset classes

Long Memory

- Slow decay of autocorrelation in absolute and squared returns
- Hurst exponent and fractional integration
- Long memory vs. structural breaks
- Implications for forecasting

Aggregational Gaussianity

- Return distributions approach normality as the time horizon increases
- Central Limit Theorem in the financial context
- Empirical demonstration across different frequencies
- Implications for risk measurement at different horizons

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Conclusions

- Summary of the main stylized facts of financial returns
- How stylized facts guide model selection
- Universality across markets, assets, and time periods

References

- Cont, R. (2001). Empirical properties of asset returns: stylized facts and statistical issues.
- Mandelbrot, B. (1963). The variation of certain speculative prices.
- Pagan, A. (1996). The econometrics of financial markets.