



Contents

Abstract	I
Zusammenfassung	III
Acknowledgment	V
1 Introduction	1
1.1 Time Series Fundamentals	1
1.2 Overview of Bootstrap Methods for Time Series	4
1.3 Network Fundamentals	6
References	9
2 Spectral-Density-Driven Bootstrap	13
2.1 Introduction	13
2.2 Estimated Wold Representation	16
2.2.1 Moving Average and Autoregressive Representation	16
2.2.2 Estimating the Coefficients of the Wold Representation	18
2.2.3 Spectral Density Estimators	22
2.3 Spectral-Density-Driven Bootstrap	23
2.3.1 The Spectral-Density-Driven Bootstrap Procedure	23
2.3.2 Comparison with other Linear Bootstrap Procedures	25
2.3.3 Bootstrap Validity	26
2.4 Numerical Examples	30
2.4.1 Simulations	30
2.4.2 A Real-Life Data Example	31
2.5 Conclusions	34
2.6 Proofs	35
2.7 Estimation of a Moving Average Model	45
2.8 Comparison with the Linear Process Bootstrap	47
2.9 Additional Simulation Results	52
2.9.1 Sample Size $n = 128$	52



2.9.2	Sample Size $n = 512$	53
2.10	Additional proofs	55
	References	59
3	Time Series Modeling on Dynamic Networks	63
3.1	Introduction	63
3.2	Time Series Modeling on Dynamic Networks	64
3.3	Statistical Results for Doubly Stochastic Network Processes	71
3.4	Numerical Examples	82
3.5	Real Data Example	90
3.6	Conclusions	94
3.7	Proofs	95
	References	119