

Contents

1	Introduction	1
1.1	On Empirical Causality	1
1.2	Causality in Economic Analysis	4
1.3	Empirical Economic Models	6
1.3.1	The Cowles Approach	7
1.3.2	Economic Time-Series Models	8
1.4	Basic Concepts for Statistical Inference	12
1.4.1	Conditional Inference	12
1.4.2	Defining Exogeneity	14
1.4.3	Interpretative Problems	17
	References	18
2	The Measures of One-Way Effect, Reciprocity, and Association	21
2.1	Prediction and Causality	21
2.1.1	Statement of the Problem	21
2.1.2	Terminology and Notations	22
2.2	Defining Non-causality	25
2.3	The One-Way Effect Measure	27
2.4	Alternative Methods for Deriving $M_{v \rightarrow u}(\lambda)$	33
2.4.1	Distributed-Lag Representation Approach	33
2.4.2	Innovation Orthogonalization Approach	34
2.5	Measures of Association and Reciprocity	37
2.6	Examples	41
	References	43
3	Representation of the Partial Measures	45
3.1	Introduction	45
3.2	Third-Series Involvement	46
3.3	Partial Measures of Interdependence	49

3.3.1	Representing the Partial Measures	49
3.3.2	Glossary on Partial Measures of Interdependence	56
3.3.3	The Stationary ARMA Model	58
3.4	Extension to Non-stationary Reproducible Processes	59
	References	63
4	Inference Based on the Vector Autoregressive and Moving Average Model	65
4.1	Inference Procedure	65
4.1.1	Three-Step Estimation Procedure	66
4.1.2	Optimization Algorithm in Step 3	68
4.1.3	Monte Carlo Wald Test of Measures of Interdependence	70
4.1.4	Monte Carlo Wald Testing of Non-causality	73
4.2	Simulation Performance	75
4.2.1	Designing Monte Carlo Simulation	75
4.2.2	Simulation Results	77
4.2.3	Comparison of Step 2 and Step 3 Estimation	82
4.3	Empirical Analysis of Macroeconomic Series	87
4.3.1	Literature	87
4.3.2	Application of the Partial Measures to US Macroeconomic Data	91
	References	101
5	Inference on Changes in Interdependence Measures	103
5.1	Change in Measures	103
5.1.1	Change in Measures for Stationary Vector ARMA Model	104
5.1.2	Inference for Noncausal Relationship	107
5.2	Tests Based on Subsampling Method	108
5.2.1	Test for a Change in Measures Using High-Frequency Data	108
5.2.2	Variance Estimation via Subsampling	110
5.3	A Simulation Study of Finite Sample Test Properties	110
5.3.1	Change in Simple Causality Measure	111
5.3.2	Change in Partial Causality Measure	113
5.4	Empirical Illustrations	114
5.4.1	Stock Returns and Dividend Yields	114
5.4.2	Intra-Daily Financial Time Series	117
	References	122
	Appendix: Technical Supplements	123
	Index	131



<http://www.springer.com/978-981-10-6435-7>

Characterizing Interdependencies of Multiple Time
Series

Theory and Applications

Hosoya, Y.; Oya, K.; Takimoto, T.; Kinoshita, R.

2017, X, 133 p. 32 illus., Softcover

ISBN: 978-981-10-6435-7