

Master of Economics

Lecture Title:	Topics in Time Series		
Lecturer:	Martin Wagner		
Lecture Code:	017919	ECTS:	3
Term:	Winter/Spring 2017	Contact hours:	20
Lecture Dates:	See teaching calendar		
Final Exam:		Frequency of lecture:	
Prerequisites:			
Language of instruction:	English		
Contact information			
	Telephone:	Email: mawagner@ihs.ac.at	
Office hours			
Course website			
Learning Objectives: (What are the intended learning outcomes? Which skills will be acquired?)	The course discusses some key concepts and modelling tools relevant for the analysis of macro-economic time series in quite some detail. In order to set the stage, the course will recap some of the key definitions and results for stationary processes. Thereafter the implications of unit roots, as well as testing for unit roots are discussed in detail. The third topic is cointegration, which is considered in both regression and VAR settings. If time permits, some discussion on structural VAR models is included.		
Content: (Which professional competence and which contents will be imparted?)	Introduction Stationary Processes • Stochastic processes and stationarity • White noise, autoregressive (AR), moving average (MA), autoregressive moving average processes, causality, invertibility • Multivariate ARMA processes • Estimation of mean and covariances • Parameter estimation for AR (and ARMA) processes • Further topics (model selection, state space representation, forecasting,...) Univariate Integrated Processes and Unit Root Tests • Integrated processes • The functional central limit theorem (working with Brownian		

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	motions') • Testing for unit roots (and testing for stationarity) • Further topics (structural breaks or unit roots, seasonal unit roots, higher integration orders) Multivariate Integrated Processes and Cointegration • The triangular representation: the cointegrating regression • Estimation: OLS, Fully Modified OLS, Dynamic OLS, Integrated, Modified OLS • Testing for cointegration: residual based tests • Further topics (monitoring,...) Cointegration Analysis with Vector Autoregressive Models: The I(1) Case • Granger representation theorem • Johansen's ML - Reduced rank regression approach: parameter estimation and testing for the cointegrating rank • Further topics (the role of deterministic components, weak exogeneity,...) Structural Vector Autoregressive Models • Stationary Case: Different types of structural models/relationships • Cointegrated Case: The structural vector error correction model • Estimation • Structural impulse response functions (IRFs) and forecast error variance decompositions (FEVDs) • Further topics (sign restrictions, factor augmented VAR models)
Teaching Approach: (Description of the learning and teaching methods)	Lectures and problem sets
Workload: (Definition of workload (ECTS), divided in pre-modules (e.g. pre-readings), core-modules (contact hours), post-modules (e.g. case studies)):	

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Required literature: (scripts, books, articles, cases, papers)	See the separate course outline document for a commented list of books. Necessary articles will be made available.
Recommended literature: (books, articles, cases, papers)	See above
Special features: (e.g. excursion, guest speaker):	
Mode of examination: (Mode of examinations and tests (e.g. oral or written examination, lecture, homework, papers, class participation)):	Exercises and “seminar paper” type final project
Grading:	Exercises: 40% “Seminar paper”: 60%

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Lecture Times:

Mon Apr 10	3:00pm – 5:00pm	<i>Seminarraum 201</i>
Tue Apr 11	3:00pm – 5:00pm	<i>Seminarraum 201</i>
Wed Apr 12	8:00am – 12:00pm	<i>Seminarraum 201</i>
Fri Apr 21	10:00am – 12:00pm	<i>Seminarraum 201</i>
Mon May 8	10:00am – 12:00pm	<i>Seminarraum 201</i>
Mon May 8	1:00pm – 3:00pm	<i>Seminarraum 201</i>
Mon May 15	10:00am – 12:00pm	<i>Seminarraum 201</i>
Mon May 15	1:00pm – 3:00pm	<i>Seminarraum 201</i>
Mon May 29	10:00am – 12:00pm	<i>Seminarraum 201</i>