

INTERNATIONAL MANAGEMENT INSTITUTE, BHUBANESWAR
FN632 Financial Econometrics
PGDM 2017-19 Term IV
CREDIT: Full (3 credits)
SESSION DURATION: 60 Minutes

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Learning Outcomes:

1. To provide an in-depth understanding of various econometric tools to analyze a given time series
2. To expose the students to model building fitting into the data and forecasting
3. To apply the concepts in risk management especially with respect to tail behavior of a given series

Pedagogy:

The course will be delivered through a mix of lectures and class room exercises. The course will be delivered using R.

Evaluation Criteria:

Project	20%
Assignments	20%
Mid Term	30%
End Term Examination	30%

Learning Outcomes:

LO1: Getting exposure about basic time series calculus

LO2: Learn about the time series modeling

LO3: Interpretation and policy usefulness

Readings:

Financial Time Series Analysis – Ruey Tsay (3e; Wiley India)

Session plan:

Session No.	Topic	Learning Outcomes	Readings
1-4	Basic mathematics <ul style="list-style-type: none">• Matrix operations• Differential and Integral calculus• Stochastic Calculus• Ito's Lemma	LO1	Class Exercise Tsay, Chapter 6
4-8	Introduction to Financial Data <ul style="list-style-type: none">• One period and multiperiod returns• Distributional Properties of returns (Joint, marginal and conditional)• Moments of a random variable – Mean, Variance, Skewness and Kurtosis	LO1, LO2	Tsay, Chapter 2

	<ul style="list-style-type: none"> Performing t-tests for sample moments Importing data [<i>getsymbols</i> command in R], from csv file 		
9-13	Visualizing Financial Data <ul style="list-style-type: none"> Understanding normality of data Jarque-Bera test, QQ Plot Histogram Kernel Density function Stationarity of data (Strong and Weak) Testing for Unit Root (ADF test) 	LO2	Tsay, Chapter 1 & 2
14-19	Linear Models <ul style="list-style-type: none"> Concepts of autocorrelation, white noise, random walk AR (p), MA(q) and ARMA (p,q) modelling Testing for serial correlation: Ljung –Box and Box – Pierce Tests Selecting models using ACF, PACF and EACF graphs, AIC and BIC Criterion 	LO2	Tsay, Chapter 2
20-22	Univariate Volatility Modelling <ul style="list-style-type: none"> Meaning of volatility and its measurements Heteroscedasticity in data Testing for ARCH effects ARCH (p) and GARCH (p,q) models Forecasting using GARCH models DCC-GARCH Models 	LO2, LO3	Tsay, Chapter 3
22-25	Multivariate Volatility Modelling <ul style="list-style-type: none"> Vector Autoregression Cointegration (Johansen Cointegration test) VECM 	LO3	Tsay, Chapter 8
26-30	Risk Measures <ul style="list-style-type: none"> Value at Risk (VaR) Extreme Value Theory (EVT) Introduction to Copula functions 	LO3	Tsay, Chapter 7