University of Colorado - Department of Economics - Fall 2012 ECON 4858 Financial Econometrics Professor Carlos Martins-Filho

O ce. Economics Building 105.

Meetings. Mondays, Wednesdays and Fridays 1:00 PM - 1:50 PM in ECON 117.

O ce hours. Wednesdays 2:00 PM - 3:30 PM and by appointment. For appointment send an email to carlos.martins@colorado.edu.

Prerequisites. Successful completion of ECON 3818 or equivalent is a required pre-requisite. ECON 4818 is desirable, but by no means necessary.

Objectives. Introduce statistical models, estimation and testing procedures used in analyzing nancial data.

Class URL. http://spot.colorado.edu/~martinsc/ECON_4858.html.

Grades. Grades (A-F) will be based on the following2nol ng2nol ng2nol ng2nol ng2nol 439333.7618 1ng225030

3. Campbell, J., Lo, A., and MacKinlay, A. C., 1997, The Econometrics of Financial Markets. Princeton University Press, Princeton, New Jersey.

This is an advanced textbook, normally used in graduate courses. Its study is recommended for those that have taken more advanced courses in probability, statistics and econometrics and are looking for a deeper understanding of what we discuss in class.

4. Hanselman, D. and Little eld, B., 2005, Mastering MATLAB 7. Pearson, Upper Saddle River, New Jersey.

This is one of many step-by-step manuals/guide to MATLAB that are commercially available. It is very easy to read and provides speedy access to the many resources this software o ers.

Topics.

All readings are from the textbook and class notes.

1. Introduction and Basic Concepts for Probability and Statistical Models

Random variables

Distribution functions, Cumulative distribution functions

Quantiles Moments Order statistics

Skewness, kurtosis and heavy tail distributions

Multivariate distributions, marginals and conditional distributions

Prediction Estimation - maximum likelihood, least squares

Hypothesis testing and con dence intervals

2. Returns (3 hours) The random walk model The e cient market hypothesis

3. Time Series Models

Stationarity

Autoregressive AR(p) models and estimation

Moving average models MA(q) and estimation ARMA/ARIMA models

Model selection: Akaikes information criterion (AIC) and Bayesian information criterion (BIC) Forecasting

4. Portfolio theory

Trading o expected return and risk

5. Regression

Least squares estimation

Regression and best linear prediction

Non-normality and data transformations

- 6. The capital asset pricing model
 - Capital market line, security market line Security characteristic line Using CAPM in portfolio analysis Factor models
- 7. Fixed income securities
 - Zero-coupon bonds, coupon bonds Yield to maturity Term structure Continuous compounding Continuous forward rates Sensitivity of price to yield
- 8. GARCH Models
- 9. Value-at-Risk
 - One asset Portfolio
- 10. Options pricing
 - Call options
 - The law of one price
 - Pricing calls
 - Martingales
 - The Black-Scholes model, formula and its use
 - Puts
 - Evolution of option prices
 - Leverage of options and hedging

Important information.

• If you qualify for accommodations because of a disability, please submit a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail dsinfo@colorado.edu.

If you have a temporary medical condition or injury, see Temporary Medical Conditions: Injuries, Surgeries, and Illnesses guidelines under Quick Links at Disability Services website and discuss your needs with me.

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