Statistics 435, Statistics 711

Spring 2008

Instructor

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Class Hours and Location

TuTh 3-4:20, 1201 SH-DH

Office Hours

TuTh 4:30-6 and by appointment

Teaching Assistant

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Course Materials

Class notes. These are the main source material for the course. The notes will be posted throughout the semester on webCafe.

Tsay, R. S., *Analysis of Financial Time Series,* 2nd ed. Wiley, New York, 2005. Some supplementary reading will be assigned in Tsay's book, and the book will also provide some data sets for discussion and for homework.

Software

JMP 7 statistical software, SAS Institute, Inc., Cary, NC, 2000. I *highly recommend* you buy the software so that you have it on your own computer. We will use it extensively in class and you will need to know how to read its output and use it for assignments and for reading and interpreting class materials. When you install the software on your computer you will also have installed five manuals, all in pdf format.

JMP 7 is available via http://estore.e-academy.com. A six-month license costs $29.95 and a twelve-month license sells for $49.95. If you have JMP version 5 or 6, it will be sufficient—for our purposes the differences between versions 5, 6 and 7 are minor.

JMP IN software is installed in the Wharton computer labs, all in Huntsman: F75 (60 seats), F80 (29 seats), 375 (80 seats) and 380 (80 seats).

Course website

Statistics 435/711 is using webCafe. You can gain access by going to
http://webcafe.wharton.upenn.edu and following the link to the Statistics Department.
All materials for the course will be distributed and managed via the website.

Note for non-Wharton students: If you do not have a Wharton computing account, you
will need to establish one to access the website. The account also provides access to the
computing labs in Wharton and to the intranet. To get an account, go to

> http://apps.wharton.upenn.edu/accounts/class

After you have requested your account, allow some time for activation.

Wharton students and students who have recently taken a Wharton course have existing
accounts.

Course Description

The aims of this course are to introduce basic time series and forecasting techniques. The
emphasis will be upon the use of statistical methodology, and the written communication
of statistical results. Considerable time will be devoted to understanding statistical and
econometric problems in the contexts in which they arise, and to proper selection of
statistical techniques and interpretation of the statistical output.

As noted above, the primary class materials will be instructor's notes; the text will be
supplementary. JMP software will be used extensively in classroom presentations and
will be incorporated into the class notes. The software offers excellent graphics which
will be useful for picturing data and illustrating methodology.

For methods not covered by JMP we will employ R, time permitting.

There will be five homework assignments. Each homework will involve the analysis of
data sets and interpretation of the findings, and the presentation of a clearly organized
written report.

There are no examinations.

Calendar

Classes will be held Tuesday and Thursday beginning Thursday, 17 January. The last
class day is 29 April. There is no class scheduled for 11 and 13 March, during the week
of Spring break. Altogether there are 28 classes.

Topics

The primary goal is to present time series techniques. Basic multiple regression will be reviewed at the beginning, and additional regression topics will be presented as they are needed. For the most part, because of time limitations, attention will be focused on univariate series. Data sets studied will be primarily, but not exclusively, business and economic time series, including financial market data.

Review of Multiple Regression

Decomposition Models

ARIMA Models

Spectral Methods

Exponential Smoothing

ARCH and GARCH Models

Nonlinear Models

Combination of Forecasts