



ECON 210f-1 Fundamentals of Statistical Analysis

Brandeis International Business School
Spring Module I 2009—Thursday evenings, 6:30 pm-9:30 pm

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Hours: Thursdays 4:00–5:30 and by appointment

Overview

This one-half credit module introduces statistical thinking and analytical methods appropriate to first-year IBS graduate students with little or no prior coursework in statistics. It emphasizes critical analysis of statistical evidence to inform business decisions. Statistical software (Stata) supports the computational tasks in the course, permitting students to focus on understanding important concepts, applying models, interpreting analyses, and communicating results. Topics include descriptive statistics, sources of international financial data, continuous probability distributions, estimation, tests of hypotheses, and regression modeling.

Required Text

John, J.A., Whitaker, D. and Johnson, D.G. *Statistical Thinking in Business (2nd Ed)*. (Boca Raton FL: Chapman & Hall/CRC, 2006)

Cases

Students must obtain the following cases and readings, all of which are available in a course pack from the Brandeis University Bookstore. They are also available individually from the Harvard Business School Press (www.hbsp.harvard.edu) and Darden Business Publishing (<http://store.darden.virginia.edu>).

Publisher	No.	Title
HBSP	9-292-122	Beta Management Co
HBSP	9-894-032	Causal Inference
HBSP	U0603C	The Use and Misuse of Statistics
HBSP	R0210J	What's Your Real Cost of Capital?
HBSP	9-602-096	Store 24(A): Managing Employee Retention
Darden	UVA-QA-0595	Risk Exposure and Hedging

Course Approach

We live in a world of uncertainty. The goal of statistical analysis in business is to calibrate, cope with, and sometimes influence that uncertainty. Business decisions, government policies, scientific research, news reporting, and public opinion are all shaped by statistical analysis and reasoning. Statistical thinking is at the core of the “quality revolution” in manufacturing and service operations around the world. In this course, you will begin to engage in statistical thinking, to discriminate among and to use some fundamental statistical techniques of analysis, and to perform data analysis.

To be an effective analyst or a knowledgeable consumer of analyses in a business environment, you must know *how* to use them, know *when* to use them, and be able to *communicate* their implications. Knowing how involves mastery of fairly easy computational skills, and use of computer software. Knowing when requires an understanding of the theory underlying the techniques, and practice with applications of the theory. Effective communication requires a clear understanding of the theory and techniques, as well as clarity of expression, directed towards a particular audience.

Because these three skills are different, we will approach each of them in slightly different ways. Classes will combine lecture, demonstrations, team exercises, class

discussion, and hands-on practice.

Prerequisites

There are no formal prerequisites for this module. Students should be familiar with Excel and basic algebra. *If you have had more than one prior course in statistics, this course may be too elementary for you. See me if you are in doubt.* The target audience for this course is those students with little or no prior background, and their needs will have the highest priority in the class.

Keeping Informed

We'll make regular use of LATTE and a course mailing list (registering in the course automatically adds you to both lists). All lecture notes, handouts, and supporting materials will be available via LATTE, and any late-breaking news will reach you via the mailing list. Please check your Brandeis email regularly to keep apprised of important course-related announcements.

Participation & Contributions

IBS is truly an international community of learners, each with something to contribute to the enterprise. Each student in the class should regard participation as a chance to contribute to our joint efforts and helping fellow students to learn.

Moreover, because this module aims to build both understanding and effective communication skills, class participation is important. Statistics is not a spectator sport; you will learn by *doing* rather than by watching. Participation can take many forms, and each student is expected to contribute actively, freely, and effectively to the classroom experience by raising questions, demonstrating preparedness and proficiency in the analysis of problems and cases, and explaining the implications of particular analyses in context. To this end, *class attendance is required, and students should use name cards.*

Written Assignments

Written assignments will include traditional problem sets, case analysis memos and a group project (see below). All written material is due at the beginning of class unless otherwise specified. In your written work, the *clarity and correctness of your explanations is at least as important as the numerical correctness of your analysis.* A written assignment with correct numerical answers but no suitable prose would receive one-half credit. All assignments are due at the start of class in hardcopy, and late papers will receive reduced grades. If you are absent, your paper should arrive electronically that day.

Project

Small teams will produce an original regression-based project. **Instead of an in-class final exam, each group will prepare a final project and PowerPoint slides suitable for a presentation.** Assignment details will be distributed separately.

Evaluation

Your final grade in the course will be computed using these weights:

Participation	15%
Homework sets (2)	25%
Memos (3)	35%
Project (incl. presentation)	25%
TOTAL	100%

Your course grade will reflect your performance on assignments relative to your classmates. Typically, grades range from A to B- for most students.

Academic Integrity

You are expected to be familiar with and to follow the University's policies on academic integrity (see <http://www.brandeis.edu/studentlife/sdje/ai/>). Instances of alleged dishonesty will be forwarded to the Office of Campus Life for possible referral to the Student Judicial System. Potential sanctions include failure in the course and suspension from the University.

Disabilities

If you are a student with a documented disability on record at Brandeis and

wish to have a reasonable accommodation made for you in this class, please see me immediately.

Study Groups Working with one or two partners is an excellent way to gain deep understanding of this subject. I encourage small groups to work on assignments, with a few caveats:

- Be sure that you are neither carrying nor being carried by the group; each member of the group is entitled to learn.
- For memos and problem sets, you may work alone or with as many as 2 partners; groups should submit just one paper.
- Each group member retains the right to “go it alone.” Joining a group is not a marriage, and you can leave a group at any time.

Course Outline

Note: This module meets only seven times for about three hours per session; your attendance and involvement are crucial. The column headed “Read before class” refers to chapters in the John, Whitaker, & Johnson (JWJ) text. Most text chapters will be covered in full and some in part. The right-most column indicates other readings, cases and assignments.

	Date	Topic	Read before Class	Case Reading/ Milestone Event*
1	15-Jan-09	Course Introduction Variation & Causation Introduction to Stata software	1–2	In-Class exercise
2	22-Jan-09	Data display and graphing Data Modeling with Summary statistics	3–4	Draft Memo #1 due Beta Management Case
3	29-Jan-09	Methods of Sampling Estimation	6 7.1–7.8	Problem Set #1 due Store24(A) case “Use and Misuse of Statistics”
4	5-Feb-09	Significance Tests Intro. to Linear Regression	7.9–7.13	Draft Memo #2 due “Risk Exposure & Hedging”
5	12-Feb-09	Simple Linear Regression analysis Intro to Multiple regression	8	Final Memo due “What’s Your Real Cost of Capital?”
6	26-Feb-09	Multiple regression Course evaluations	9	Problem Set #2 due “Causal Reasoning” Store24(A) revisited
7	5-Mar-09	Projects are due on this date. No Class meeting per se		

Please note:* written assignments are due, preferably on paper, at the start of class. **Late papers will receive reduced grades, except in extraordinary circumstances. If you must miss class, your paper should arrive electronically by the end of the business day (6 pm).