McGill University
Department of Economics
Class Time: Mon/Wed 14.35-15.55
Class Room: STBIO N2/2

Instructor: Dhanoos (Dee) Sutthiphisal
Office: 3610 McTavish, Room 11-3
Office Hours: Tue/Thu 10-11.20 & After class
E-mail: via WebCT
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ECON 257D2: ECONOMIC STATISTICS HONORS **WINTER 2010**

Course Objectives

This course is the second part of the one-year, 6-credit Econ 257D sequence. The goal of this course is to build upon the statistical ground work that you have learned in the fall semester and introduce you to the methods economists use to test economic theories in the real world. Particularly, we will focus on regression analysis with the emphasis on both the theory underlying such analysis and the actual application of the theory to analyze real world problems. (Note that because of time limits, we will not spend much time on time series regression analysis although it is an important area in econometrics.)

Course Prerequisites

An understanding of basic probability theory is essential.

Software and Textbooks

You are required to use STATA for the problem sets and term project. (I will test your knowledge of the software in the exams.) The recommended textbook for this course is Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Fourth Edition (Thomson South-Western, 2008) – Earlier version is fine as well.

Students may also find the following textbooks useful. (All these books offer a great discussion on regression analysis but not on probability theory.)

Damodar N. Gujarati, *Essentials of Econometrics*, Second Edition (McGraw-Hill, 1999) – Less advanced than Woodridge's book.

Damodar N. Gujarati, *Basic Econometrics*, Fourth Edition (McGraw-Hill, 2003) – Slightly more advance than *Essentials of Econometrics*, but still less advanced than Woodridge's book.

Robert S. Pindyck and Daniel L. Rubinfeld, *Econometric Models and Economic Forecasts*, Fourth Edition (McGraw-Hill, 1998) – Slightly more advanced than Wooldridge's book.

Jack Johnston and John DiNardo, *Econometric Methods*, Fourth Edition (McGraw-Hill, 1997) – A nice classic book that efficiently discusses the concepts (but more technical), read Chapters 1 and 2 only (the Chapters beyond Chapter 2 are too advanced for this class).

Course Requirements

There are 2 exams in this course: midterm and final. The midterm is on Thursday March 5. The final is cumulative and is on the date given by the university. These exams will consist of T/F, problem-solving (theory), empirical questions and STATA programming questions. In addition to the two exams, you are required to complete a term project (there may be questions about it in the final). Deadline for the term project and how to submit it are discussed on the following page. Instructions for the term project will be posted on the Class Web by January 30. I will be happy to provide some assistance for the project during my office hours. Also, if you hand in your project draft at least 2 weeks before the deadline, I will give you suggestions that may help increase your grade for the project.

Class Notes, Readings and Problem Sets

Class notes, readings and problem sets (with solutions) will be posted on the Class Web. Use them at your own risk. I have tried to eliminate typing errors when preparing these materials. However, it is very likely that there are still (a few) errors in the notes and the solutions. You must use your own judgment when utilizing these materials. (I would appreciate it if you could let me know where the errors are so that the future generation of students can benefit from better class materials.)

Although the problem sets will not be counted towards your grade, it is in your best interest to familiarize yourself with the concepts given in class by solving the problems. Also, an understanding of the required readings will be helpful in answering questions in the exams.

Office Hours and Review

Regular office hours are listed on the first page. For each exam, I will schedule extra office hours which will be announced in class a week before the exam. However, you should not let questions accumulate until the week before an exam. It is not healthy to panic at the last minute and it is difficult to work things out under pressure.

For students with a legitimate time conflict with the office hours, you can make an appointment with me by e-mail when you need help. In addition, I will give a review session for the midterm on Monday March 1 and for the final on Wednesday April 14.

Communication Policies

In addition to office hours, please feel free to ask me questions via the Internet. I encourage you to use the Class Discussion function in WebCT to ask me questions since they may also benefit your classmates. Should you need to contact me via email, please use the WebCT email system. Please do not contact me via my usual McGill email. For the night before each exam, I will answer your e-mails if and only if I receive them BEFORE 10 PM.

If there is an important announcement such as extra office hours and review, I will also e-mail you. To be able to receive my announcements, you need to update your email address in Minerva.

Exam Policies

The midterm scores and grades will be posted on the Class Web. You are not allowed to keep your exams. If you would like to review your exams, please see me during my office hours or make an appointment.

Grade Appeals

If you are not satisfied with how your exam/term project (or any part of it) is graded, you may submit a grade appeal in WRITING. If you choose to do so, your entire exam/term project will be reviewed. There will not be a partial re-grading, and you may receive a lower grade after the appeal.

Grade Assignment

For Schemes 1 and 2, you will receive a letter grade for each exam and the term project. Your grade for each exam is based on a class distribution, whereas your grade for the term project is based on your own performance.

Scheme 1		Letter Grade	Numeric Grade	Course Grade Lower Bound
Term Project	25%			
Midterm	25%	A	4.0	3.85
Final	50%	A-	3.7	3.50
		B+	3.3	3.15
		B	3.0	2.85
		B-	2.7	2.50
Scheme 2		C+	2.3	2.15
		C	2.0	1.85
Term Project	25%	D	1.0	0.85
Midterm	0%	F	0.0	0.00
Final	75%			

For Scheme 3, you will receive the grade for the course based on the McGill percentage scale.

Scheme 3			Total Score
		Letter Grade	Lower Bound
Term Project	25%		
Midterm	25%	A	85%
Final	50%	A-	80%
		B+	75%
		B	70%
		B-	65%
		C+	60%
		C	55%
		D	50%
		F	0%

The grade you receive for the winter semester will be from the scheme that yields the highest grade. For example, suppose you receive 50 out of 100 for the term project, 100 out of 200 for the midterm and 80 out of 100 for the final; and the curves give you a B- from the term project, a C for the midterm and an A for the final. Scheme 2 is obviously better than Scheme 1 and will give you: $2.7 \times 0.25 + 4.0 \times 0.75 = 3.68 < 3.85$ → an A-. Scheme 3 gives you $(50/100) \times 0.25 + (100/200) \times 0.25 + (80/100) \times 0.50 = 65\%$ → a B-. Hence, your course grade would be an A-.

Note that the grade reported in your transcript is an average of fall and winter grades. However, I also keep your letter grade for winter for my records. (Someone, e.g. fellowship granter, may ask you to inform him/her about the grade for each semester of Econ 257D. I will be happy to provide such letter for you.)

Grade Assignment for Econ 257D Sequence

To receive credits for this one-year, 6-credit Econ 257D sequence, you must take BOTH Econ 257D1 in Fall 2009 (professor Zinde-Walsh) AND this Econ 257D2 in Winter 2010. Your final grade for the Econ 257D sequence is in a letter grade and is determined by the average grade that you receive from the two courses.

To be able to calculate the grade average, the formula below is used to convert your winter grade in to a percentage-scale score. (This is only for those whose winter grade is from scheme 1 and 2.)

Winter GPA Lower Bound	Percent	Winter GPA Lower Bound	Percent	Winter GPA Lower Bound	Percent	Winter GPA Lower Bound	Percent
4.000	100						
3.990	99	3.090	74	0.833	49	0.408	24
3.980	98	3.030	73	0.816	48	0.391	23
3.970	97	2.970	72	0.799	47	0.374	22
3.960	96	2.910	71	0.782	46	0.357	21
3.950	95	2.850	70	0.765	45	0.340	20
3.940	94	2.780	69	0.748	44	0.323	19
3.930	93	2.710	68	0.731	43	0.306	18
3.920	92	2.640	67	0.714	42	0.289	17
3.910	91	2.570	66	0.697	41	0.272	16
3.900	90	2.500	65	0.680	40	0.255	15
3.890	89	2.430	64	0.663	39	0.238	14
3.880	88	2.360	63	0.646	38	0.221	13
3.870	87	2.290	62	0.629	37	0.204	12
3.860	86	2.220	61	0.612	36	0.187	11
3.850	85	2.150	60	0.595	35	0.170	10
3.780	84	2.090	59	0.578	34	0.153	9
3.710	83	2.030	58	0.561	33	0.136	8
3.640	82	1.970	57	0.544	32	0.119	7
3.570	81	1.910	56	0.527	31	0.102	6
3.500	80	1.850	55	0.510	30	0.085	5
3.430	79	1.650	54	0.493	29	0.068	4
3.360	78	1.450	53	0.476	28	0.051	3
3.290	77	1.250	52	0.459	27	0.034	2
3.220	76	1.050	51	0.442	26	0.017	1
3.150	75	0.850	50	0.425	25	0.000	0

The average grade will be rounded up for the score of half a percentage point or above. Anything below that is rounded down. For example, suppose you receive 77 out of 100 in fall and a GPA of 3.68 in winter. Since $3.64 < 3.68 < 3.71$, your winter grade is 82 in the percentage scale. Hence, your sequence average will be $0.5 \times 77 + 0.5 \times 82 = 79.5$. Your grade will be rounded up to 80, and hence your sequence grade on the transcript will be an A-.

Supplemental Exam Policy

The supplemental exam for Econ 257D sequence will account for 70% of your grade. The supplemental exam cannot makeup for the term project in the winter semester nor the assignments and the midterm in the fall semester. So, the remaining 30% of your grade comes from assignments and midterm in fall 2009 (17.5%) and the term project in winter 2010 (12.5%). The supplemental exam will cover materials from both Econ 257D1 and Econ 257D2. Your grade for the course will be based on the McGill percentage scale as in Scheme 3 if you take the supplemental exam.

Academic Integrity Statement (It is mandatory that I put this in the syllabus.)

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures.

See www.mcgill.ca/students/srr/honest/ for more information.

Right to Submit in English or French Written Work that is to be Graded

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

Term Project Deadline and Late Penalties

Extensions for submission of term project will only be given in cases of illness, where a medical certificate is provided. You need to submit a hard copy of the term project to me (for grading purpose) as well as an electronic version to TurnItIn.com (to verify authenticity). (Using TurnItIn.com will help me focus my grading on your ideas rather than putting an effort to check the authenticity of your work. Hence, I can give you the mark fairly and promptly.) By 10am of Wednesday April 14, you must submit an electronic version to TurnItIn.com. The hard copy can be submitted after 10am but must be before 5.30pm of the due date (April 14). A project submitted late (electronically) will lose 20% of the points a day (each 24-hour period from the deadline) including during the weekend. For example, suppose you earn 60 points out of 80 for the project that was 1 day late. You will lose 12 points for the project. (Your project will be first assigned points without considering whether you are late or not. Then, the mark down will be applied.) No project will be accepted after 10am of the 5th day after the due date. (Except in cases where a medical note has been supplied AND you have made arrangements with me in advance.)

Alternatives to Use of TurnItIn.com

Requests for exemption from the Turnitin.com requirement will NOT be considered after Friday January 29, 2010. If you do not wish to use Turnitin.com, you must do the following. Submit to me, by January 29 at 5pm, a letter of intent stating that you do not wish to use TurnItIn.com. In the letter, you must also specify which of the three following alternatives you would like to use instead of submitting the term project to TurnItIn.com:

(1) Instead of using the data I will be making available to the class (for those who use TurnItIn.com), set up research question(s) that you would like to test empirically and then collect a data set that could help you answer the questions. This data set must be an original

data set. You must collect the data yourself. The data set must have at least 25 variables and 250 observations. I will be available during office hours for consultation about how you intend to go about data collection. In addition, your plan for constructing the dataset must be approved by me before February 19. (To get approval, you must set up an appointment to discuss your plan. If the plan is approved, I will send an email confirmation that you can keep for your records. The approval will be based on the feasibility of the data collection tasks as well as whether the data you want to collect are likely to help answer your research questions. In other words, the approval is my confirmation that you are on the right track for the project.) Your grade for the project will not be curved. Your grade will be based both on how well the dataset you construct helps answer the questions and on how you apply concepts we learn in class to answer the questions of interest.

The term project must be double-spaced in 12pt Garamond font with justified 1.25-inch side margins. Use STATA and EXCEL to obtain the results. Include all your programming work (do files and/or log files) as an appendix. Excluding tables, figures and appendix, the project should be no longer than 25 pages. Be sure to explain your regression specifications (e.g., why you include certain control variables). Also, write about whether the results comply with your intuition. If no, discuss what could explain the unexpected findings. If yes, discuss the data condition(s) that could change the validity of your results.

All submissions must be in 2 hard copies. I will keep one copy for my file and return the other to you after it is graded. The deadline and late penalties for turning in the term project still apply.

(2) Use the same dataset as those who will submit the project via TurnItin.com. Follow the same instructions as those who will submit the project via TurnItIn.com, except that all submissions must be in 2 hard copies. I will keep one copy for my file and return the other to you after it is graded. The deadline and late penalties for turning in the term project still apply. In addition to the project submission, you must take an oral exam on the project. The oral exam date will be at time convenient to both of us between Tuesday April 6 and Wednesday April 14. You must let me know the preferred date and time in writing by March 15. Note that the questions to be asked include, but not limited to, STATA programming procedures and commands.

(3) Take an exam at time convenient to both of us between Tuesday, April 6, and Wednesday, April 14. You must let me know the preferred date and time in writing by March 15. Materials covered in the exam will be of an applied nature, i.e., that I would expect students who have done an empirical project to be able to answer. You will also be asked to provide answers to some parts of the exam using STATA. (A computer with STATA installed will be provided when you take the exam.) I will provide additional information about the exam by March 24. You grade for this exam will be based on the McGill percentage scale (see Grade Scheme 3 in the syllabus).

Failure to follow the procedures set out above (and also do not use TurnItIn.com to submit the work) will result in a mark of zero for the term project.

Course Schedule

Dates for topics to be covered are tentative and subject to changes, especially for the first 3 topics of the course (till Statistical Inference). We may go over the materials originally scheduled to be covered in the fall semester in this winter semester instead.

1. Introduction

Topics:	What econometrics is about Examples for questions of interests Review of basic statistics: distribution, expectation and variance
Dates:	Mon Jan 4
Required:	Supplementary Note 2: Basic Statistics
Optional:	Supplementary Note 1: Mathematics Review

2. Introduction to Estimation

Topics:	Sample vs. population Properties of estimators: unbiasness, efficiency, MSE, and consistency Introduction to STATA
Dates:	Wed Jan 6, Mon Jan 11 & Wed Jan 13 (There will be a class at a special time for STATA training.)
Required:	Supplementary Note 2: Basic Statistics Supplementary Note 3: Introduction to STATA
Optional:	*STATA Base Document Set*, STATA Press, 2007. Christopher F. Baum, *An Introduction to Modern Econometrics Using Stata*, Stata Press, 2006.

3. Statistical Inference

Topics:	Introduction to hypothesis testing (t-test and F-test) Type I and type II errors Other statistical tests Analysis of Variance
Dates:	Mon Jan 18, Wed Jan 20 & Mon Jan 25

4. OLS Regression Model: Estimation

Topics:	What econometrics is about, revisit Examples for questions of interests Overview of methodology Sample vs. population Basic data analysis (plotting graph and tabulation) Writing the model Causality and the interpretation for regression coefficients (beta) Estimating the model using OLS Goodness of fit test (R-squared)
Dates:	Wed Jan 27, Mon Feb 1, Wed Feb 3 & Mon Feb 8
Required:	Daniel S. Hamermesh and Jeff E. Biddle, "Beauty and the Labor Market," *The American Economic Review*, Vol. 84, No. 5. (Dec., 1994), pp. 1174-1194.

5. OLS Regression Model: Assumptions

Topics:	CR assumptions Property of the OLS estimators (BLUE)
Dates:	Wed Feb 10, Mon Feb 15 & Wed Feb 17 (Midterm Break during Feb 22 – Feb 28.)
Optional:	Supplementary Note 4: Large Sample Properties
Review:	**MON MAR 1**
Midterm:	**WED MAR 3** (covers materials till OLS Assumption)

6. OLS Regression Model: Specification

Topics:	The linearity of the regression function Some specification examples Time trend Semi-log model (constant growth rate) Log-log model (elasticity and increasing returns) Quadratic model (increasing returns) Standardized coefficient Dummy variables Interaction terms Difference-in-difference model
Dates:	Mon Mar 8, Wed Mar 10 & Mon Mar 15
Required:	Daniel S. Hamermesh and Jeff E. Biddle, "Beauty and the Labor Market," *The American Economic Review*, Vol. 84, No. 5. (Dec., 1994), pp. 1174-1194. Mariko Sakakibara and Lee Branstetter, "Do Stronger Patents Induce More Innovation? Evidence from the 1998 Japanese Patent Law Reforms," *RAND Journal of Economics*, Vol. 32, No. 1 (Spring 2001), pp. 77-100.
Optional:	Supplementary Note 5: How to Read an Empirical Paper

7. OLS Regression Model: Inference

Topics: Classical normal regression (CNR)
Hypothesis testing & result interpretation (magnitude & significance)
t-test (one coefficient)
F-test (joint-testing)
Chow test

Dates: Wed Mar 17 & Mon Mar 22

Optional: Gregory C. Chow. "Tests of Equality Between Sets of Coefficients in Two Linear Regressions," *Econometrica*, Vol. 28, No. 3. (Jul., 1960), pp. 591-605.

8. OLS Regression Model: Validity

Topics: Specification errors (omitted variables, irrelevant variables, specification tests)
Correlated X's (multicollinearity) – consequence, detection and correction
Non-constant variance (heteroscedasticity) → GLS, WLS
Correlated error terms (autocorrelation/serial correlation and time series)
Stochastic X's → neoclassical regression model
Non-exogenous X's (measurement errors and endogenity) → IV, 2SLS, SEM

Dates: Wed Mar 24, Mon Mar 29, Wed Mar 31, Wed Apr 7 & Mon 12
(Easter Holiday: Mon Apr 5)

Required: Javier Escobal and Sonia Laszlo, "As Time Goes By: Measurement Error in Access to Market Data. Evidence from Peru," *Mimeo*, McGill University, 2004.

Daron Acemoglu, Simon Johnson and James A. Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *The American Economic Review* Vol. 91 (Dec. 2001), pp. 1369-1401.

John C. Brown and Timothy W. Guinnane, "Regions and Time in the European Fertility Transition: Problems in the Princeton Project's Statistical Methodology," *Mimeo*, Yale University, 2004.

Optional: William J. Collins and Robert A. Margo, "The Economic Aftermath of the 1960s Riots: Evidence from Property Values," *NBER Working Paper* No. 10493, 2004.

9. Other Estimations

Topics: Time series
Binary choice models (logit and probit)
Maximum Likelihood Estimation (MLE)

Dates: Wed Apr 14

Review: WED APR 14