Econometrics — Economics 345

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Course Goal We shall look upon econometrics as something practiced by optimizing agents. Instead of assuming that the goal of estimation is to best contribute to public knowledge, we shall assume that the goal of estimation is to best contribute to private well-being. [This will suggest why professional ethics in statistics are important, something presupposed by the GMU honors code that is included.] Private optimization requires that we consider econometric estimation as a choice. This, of course, requires that econometrician has more than one estimate feasible. The authors of our two texts disagree about underlying distributions; we shall consider working on the empirical distribution as a way to address the disagreement.

Texts. Ashley *Fundamentals of Applied Econometrics*, John Wiley, 2012.
Mosteller & Tukey *Data Analysis and Regression*, Reading, MA 1977.
Bookfinder.com is your friend for used books.
Shazam http://www.econometrics.com/ [We have a site licensed version 11.0]
Maxima http://maxima.sourceforge.net/ [This is open source]

Shazam The new version (11) is very fast since it can use all the processing power of the new multi-core Intel chips. There is a large instruction book in PDF form included in the download.

Maxima seems a little clunky but it is free.

Grades 1) Weekly problem sets: Handed out every Tueday, due the following Tuesday (100 points); 2) Take-home midterm exam (100 points); 3) In-class midterm (100 points); 4) Solow replication (100 points); 5) Real replication study (200 points); 6) Final exam on all the material (200 points). The homework but only the homework can be resubmitted to improve the grade **if and *only if the homework was initially submitted when it was due.*** The important dates on the Replication Study are on the pages below.

Questions *Shazam information?* Ask me. The manual is very complete. *Incompletes?* Not without a medical excuse. *Homework submission to my gmail account?* Only the first attempt. Make sure that the SUBJECT in the email has your name and the course number with a space between the name and number so I can find them easily. And make sure your name is on EVERY page of the paper since the printer is another room. (Headers / footers work just fine.) Resubmissions need to have the initial try attached to the resubmission so that can't be turned in by email. *Can I use a program other than Shazam? R* or STATA will be fine too. *Working together?* **OK on homework but not on the replications.** *Why are we using M&T — it is so old?* M & T has the courage to confront uncertainty, everything else confronts risk. M & T might be the third hardest book you read at GMU. Plato's *Republic* and Smith's *Moral Sentiments* are harder. No pain, no gain.

Economics 345

Week 1. Setting things up

Shazam 11 & Introduction to monte carlo [simulation] methods
Maxima handling of distributions
Get your LC Card. Visit the reading room in both Jefferson and Adams.

Week 2. Standard error of the sample median and the empirical distribution

Monte carlo methods when the underlying distribution is known and when it isn't (handouts)

Week 3. When the problem is uncertainty not risk

Ashley, chapters 1-4; Mosteller & Tukey, chapters 1-9 [quickly, cut one]

Week 4 Regression (first cut!)

Ashley, chapter 5; Mosteller & Tukey, chapters 10-14

Week 5 In-class midterm (Thursday)

Weeks 6. Solow article

Robert M. Solow, "Technical Change and the Aggregate Production Function" *The Review of Economics and Statistics,* Vol. 39, No. 3. (Aug., 1957), pp. 312-320.

Week 7. Testing hypotheses with regression (Take-Home Midterm handed out)

Ashley, chapter 6-7; Mosteller & Tukey, chapters 1-9 (again, 2nd cut)

Weeks 8-9. Dependence & time series

Ashley, chapters 13-14

Weeks 10-13. Biased estimation

Ashley, chapters 11-12
Feigenbaum and Levy, "The Market for (Ir)reproducible Econometrics" *Social Epistemology* 1991
Levy & Peart, "Inducing Greater Transparency" *Eastern Economic Journal* 2008

Econometrics: Problem Set 1

1. Get Shazam up and running.

   a. Send me your First and Last names and the email address you want to use to DavidMLevy@gmail.com

   b. I'll register you for Shazam.

   c. I'll send you a link to the data file (ONE.TXT) for the first exercise.

   d. You will be sent a link to download a copy of Shazam 11.

   e. Install it. [You'll need a dual boot program if you're using a Mac but students who do haven't had any problem.

2. Download ONE.TXT. Compute the sample means and medians for the two data streams (X and Y) in ONE.TXT. Check your answers with mine. My commands are in lower case, Shazam responds in upper case. If your file doesn't have 1000 pairs drop me a note and I'll send the file another way. The one trick I've used assigns the Shazam default to a jump drive E. You do that by click on FILE and then OPTIONS. Then you can assign a physical drive to be the default. You have to exit Shazam and reload for this to take effect. I've made the root directory of E: the default in the run next.

Welcome to SHAZAM (Double Precision) v11.0 - JUNE 201 Windows7 PAR=112400
...NOTE..CURRENT WORKING DIRECTORY IS: E:\ [this is the Default drive now]
|_read (one.txt) x y/skiplines=1
...NOTE..UNIT 88 IS NOW ASSIGNED TO: one.txt

...NOTE..SAMPLE RANGE IS NOW SET TO: 1   1000
|_stat x y /pmedian
NAME N MEAN ST. DEV VARIANCE MINIMUM MAXIMUM
X 1000 -0.31789E-01 1.0230 1.0465   -3.5060   3.2298
Y 1000 3.8049 44.258 1958.7   -256.20   1203.1

VARIABLE = X MEDIAN = -0.10679E-01

VARIABLE = Y MEDIAN = 2.0939

3   What is the standard error of the sample means? This should be a review question. What is the standard error of the sample medians? If this is not a review question perhaps the web will give an answer? Upon what does the web answer depend?

4   (Extra credit) Install Maxima. Compute the first four moments of the standard normal distribution.

Replication study

In overview the problem is to take a piece of published work, obtain the data, recompute the regressions as indicated in the article, summarize the deviation between your computations and the article's, and submit a printed (!) report describing your adventures. You will also do some light robustness checks. You *must* include documentation of all the estimates you report. The paper *must* be submitted in "standard" form. Paper or PDF only. I'm partial to the University of Chicago rules codified by Kate L Turabian. You can find the rules by "Turabian style" in google.

The sixth week of class will be a "trial replication" in which you will be responsible for the replication of Robert Solow's great article on technical change. Here, everyone in class will do the same article. I'll work through the details that week. The data is included in the Solow article. Yes, you have to turn in a paper in the standard Turabian form. I'll hand out the particular format to use to report the work in class that week.

The "real" replication paper is a central assignment for this "writing intensive" class. You will submit a first draft on or before *11ᵗʰ week of classes.* I'll have it back on or before the last day of classes so you can make the needed revisions. You will submit the final version *along with a copy of the draft with my comments* on or before the final exam. The final exam time & date is *listed in the University schedule.*
That is part of the contract between you and the University.

What article to replicate? This is up to you. What is a piece of published work? Any empirical article in any economics journal with a regression reported at any time is, in principle, acceptable. However, some articles are too technical or the data sets are too large. It is your responsibility to find an acceptable article of applied econometrics. Look in JSTOR for articles in the late 1950s, early 1960s or even earlier. Then you need to select an article and then write a proposal, telling me why you think why the article can be replicated. Tell me about the techniques and where the data is to be found. (Do not assume that authors will send you the data in the form you need. They may well have passed on.) The rule is that if you can't read the article, you can't replicate it. ***Your proposal is due Week 8.***

You may submit the first draft by email but the final draft needs to be in hard copy because I need to see how you responded to my comments on the first draft. I'll make an exception to this if you are willing to attach a scan of the first draft with my comments. This had to be done with a real scanner; I don't want to try to read a photograph taken by a cell phone.

The various deadlines—the proposal of an article and the first draft—are there for are a reason. It is important to start early and stay on track.

Basic facts The Library of Congress takes up three buildings: the Jefferson, the Adams and the Madison. The Jefferson and the Adams are the size of a city block each. There is a useful tunnel system connecting the three buildings. The police force is Congress's own. Congress makes the laws and is very serious about protecting itself. That's Public Choice 101. This is the safest place in DC. Those are real weapons. This is not airline "security theater." Every time there is an attempt on the life of Congressman, the security level increases.

You get your library card in the Madison Building on the floor on which you enter. You need only a government issued photo id. No, you do not need to be a US citizen nor do you need a letter from a professor at a distinguished university.

Getting there The Metro stop is Capitol South. Going from Vienna to Capitol South is trivial since there is only the Orange line service to Vienna. However, coming back, Capitol South is served by Orange, Silver and Blue lines. It is easy to find yourself in an odd part of Virginia if you don't watch the colors at Capitol South. Parking is tricky around LC. The DC police are very efficient at collecting traffic revenues.

Computer stuff. All the buildings have wifi for use. Once you have an LC card you can request books online. That saves a good deal of time. The searchable periodical literature at LC is an order of magnitude better than what it available on the web.

Jefferson Building. The main reading room and the computer terminals are here on Floor 1. You need an LC card to get in either of these. You may bring a computer. To read a book on your first visit you need to first get a library card and then your present a call slip with your number on it. The books can be checked out to a reading desk or for overnight call to be picked up at the central desk next day. You may bring a digital camera which for data work can be a big deal. You need a permission slip from the reference librarians to bring in the camera. Once you have the LC card you can request books through the online LC catalog.

The Jefferson building is also the home to the Rare Book Room and the Microform Reading Room. The stacks are off limits to even serious scholars ever since it was discovered that some of us were cutting out the plates of books. LC allows readers to bring in pieces of paper so it hard to check for plates, etc. on the way out

Adams Building The Social Science Reading Room is on the fifth floor.

Madison Building The Law Library, the Newspaper Room, Prints/Photos and the LC Archives are here. You get your card in the Madison Building. The LC Archives & the Rare Book Room are very high security. They won't let you bring paper in; rather, you are given paper. Hours for the general library are 8:30a-5p on TuFSa; 8:30a-9:30pm on MWTh; closed Sunday.

Honors Code at GMU

Honor Code

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of George Mason University, and with the desire for greater academic and personal achievement, we, the members of George Mason University, have set forth the following code of honor.

I. **The Honor Committee**
    The Honor Committee is a group of students elected from the student body whose primary and indispensable duty is to instill the concept and spirit of the Honor Code within the student body. The secondary function of this group is to sit as a hearing committee on all alleged violations of the code.

II. **Extent of the Honor Code**
    Duties of the Honor Committee:
    The Honor Code of George Mason University deals specifically with:
    A. Cheating and attempted cheating,
    B. Plagiarism,
    C. Lying, and
    D. Stealing.

    A. Cheating encompasses the following:
        1. The willful giving or receiving of an unauthorized, unfair, dishonest, or unscrupulous advantage in academic work over other students.
        2. The above may be accomplished by any means whatsoever, including but not limited to the following: fraud; duress; deception; theft; trick; talking; signs; gestures; copying from another student; and the unauthorized use of study aids, memoranda, books, data, or other information.
        3. Attempted cheating.
    B. Plagiarism encompasses the following:
        1. Presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgment.
        2. Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgment.
    C. Lying encompasses the following:

        The willful and knowledgeable telling of an untruth, as well as any form of deceit, attempted deceit, or fraud in an oral or written statement relating to academic work. This includes but is not limited to:

        1. Lying to administration and faculty members.
        2. Falsifying any university document by mutilation, addition, or deletion.
        3. Lying to Honor Committee members and counsels during investigation and hearing. This may constitute a second charge, with the committee members who acted as judges during that specific hearing acting as accusers.
    D. Stealing encompasses the following:

        Taking or appropriating without the permission to do so, and with the intent to keep or to make use of wrongfully, property belonging to any member of the George Mason University community or any property located on the university campus. This includes misuse of university computer resources (see Responsible Use of Computing Policy under General Policies). This section is relevant only to academic work and related materials.

IV. **Responsibility of the Faculty**
    Professors are responsible, to the best of their ability, for maintaining the integrity of the learning and testing process,

both in the classroom and outside of it, and for fostering conditions of academic integrity. Faculty members may actively proctor examinations in situations which they believe warrant it.

To alleviate misunderstandings, all professors are required to delineate at the beginning of each semester what constitutes a violation of the Honor Code in their classes. This should include an explanation of:

    A.   The extent to which collaboration or group participation is permissible in preparing term papers, laboratory exhibits or notebooks, reports of any kind, tests, quizzes, examinations, homework, or any other work.
    B.   The extent to which the use of study aids, memoranda, books, data, or other information is permissible to fulfill course requirements.
    C.   Guidelines on what constitutes plagiarism, including requirements for citing sources.

All professors are encouraged to send the Honor Committee a written copy of their Honor Code policies, which are kept on file. These requirements should also be stated before each test, examination, or other graded work to clarify what is permissible.

Faculty members who witness an Honor Code violation should proceed as outlined under Procedure for Reporting a Violation.

V.   **Responsibility of the Students**
Students should request a delineation of policy from each professor if none is given at the beginning of each semester. Students should also request an explanation of any part of the policy they do not understand. Students are responsible for understanding their professors' policies with regard to the Honor Code. Students are also responsible for understanding the provisions of the Honor Code.

As participating members of this community, all students have the duty to report to a member of the Honor Committee, within the prescribed time outlined under Procedures for Reporting a Violation, any violations of the Honor Code. This duty is important not only because it enforces the Honor Code, but also because it gives all students the opportunity to express their respect for personal integrity and an honest academic community.

VI.   **Procedure for Reporting a Violation**
All students or faculty members witnessing or discovering a violation of the Honor Code should enlist, wherever and whenever possible, one or more corroborating witnesses to the overt act. The accuser(s) (student, faculty, or staff), within 15 working days from date of realization, notifies the Honor Committee.

The Honor Committee will, within five working days, mail a letter of accusation to the suspected party. This letter is addressed to the accused student's current mailing address listed with the Registrar's Office. The letter informs the suspected parties that they have five Honor Committee working days to contact the Honor Committee office and make an appointment to see the committee chair, who advises them of their rights and options. The Honor Committee begins an investigation, which does not involve a presumption of guilt on the part of the accused. Any member of the George Mason University academic community who knows of but does not report an Honor Code violation may be accused of lying under the Honor Code.

VII.   **Counsel for the Accused and Accuser**
Counsel for the accused and accuser may be provided by any member of the George Mason University student community, including members of the Honor Committee, but not including students of the School of Law.

VIII.   **Appearance of Witnesses**
The Honor Committee may require any member of the university community to appear as a witness before the Committee at the time of the hearing. All requests for such appearances are issued by the chair of the Honor Committee, or by the counsel appointed to that case. The appearance of the accuser is required.

IX.   **Verdict**

To find a student guilty of an honor violation, there must be a four-fifths majority vote (four to one) for a verdict of guilty. Clear and convincing evidence must be presented to find the student guilty.

A student may not be tried more than once for the same offense except when an appeal is granted.

X.   **Penalty**

If the accused is found guilty of an honor violation, the Honor Committee determines the nature of the penalty by majority vote.

The Honor Committee is not restricted to one kind of penalty but determines one commensurate with the seriousness of the offense. Typical of the range of penalties that may be given are:

A.   Oral reprimand: An oral statement to the student given by the chair of the hearing. No entry is made on the student's scholastic record.

B.   Written reprimand: A written censure placed in the confidential files of the Honor Committee and in the student's academic file but not made part of the student's scholastic transcript records.

C.   Nonacademic probation: Exclusion from holding or running for an elected or appointed office in any organization or activity associated with the university. Ineligibility to participate in any activity representing the university on either an intercollegiate or club level and ineligibility to serve as a working staff member of any student organization. This action is noted in the judicial administrator's file but is not made a part of the student's scholastic record.

D.   Service hours: Library or other supervised university service hours to be completed by a specific time. Upon completion the hold on the student's records is removed.

E.   Failing grade: Recommendation in writing to the instructor for a grade of F for the work involved, or for the entire course. The student's permanent record reflects the academic evaluation made by the instructor.

F.   Recommendation of suspension from the university for one or more semesters: A student's scholastic record

Appeal

A written request for an appeal, detailing new evidence, procedural irregularities, or other sufficient grounds that may have sufficient bearing on the outcome of the trial, must be presented to the chair of the Honor Committee within seven working days after the date on which the verdict was rendered.

would read: "Nonacademic suspension from (date) to (date)." The recommendation is made to the appropriate

XI.   Associate Provost.

Recommendation of expulsion from the university: A student's scholastic record would read: "Nonacademic expulsion as of (date)." This penalty is recommended to the appropriate Associate Provost only in extraordinary circumstances, such as for repeated offenses.

The written request is reviewed by at least three voting members who were not involved with the original case. If a new hearing is granted, no voting member from the original hearing may vote in a second or subsequent hearing of the same case.

Keeping of Records

XII.   The records of the hearing are kept in the Honor Committee's files. These records include a tape or a full transcript of the hearing and all evidence presented at the hearing. If the evidence belongs to any person other than the accused, the original is returned to the owner and a copy kept with the records of the Honor Committee.

Composition of the Committee

XIII.   The Honor Committee is proportionally composed of students from each school and faculty adviser(s), although the latter are nonvoting members. Undecided majors, B.I.S. students, and continuing education students are considered together as a school. The total number of members is as close to one-half of one percent of the student body as possible. Freshmen are appointed in the fall to serve until the following spring election. One or more clerks appointed by the committee from the student body serve as aides to the chair.

The chair of the committee is elected by majority vote of the committee members. For each hearing, five members of the Honor Committee are designated as voting members.

A faculty hearing adviser, acting as a nonvoting member of the committee, sits with and advises the committee at all hearings. The faculty adviser and faculty hearing adviser are chosen by the Honor Committee.

Previous Honor Committee members may serve during the Summer Term.

XIV.
Eligibility of Members
Any student who maintains a 2.0 grade-point average and is in good standing with the university is eligible for the Honor Committee. A committee member must maintain a 2.0 average to continue in office.

XV.
Election of the Honor Committee
The Honor Committee is elected in the spring semester. The term of office begins upon election and runs until the following spring election.

In the fall semester the chair appoints new members to fill any vacancies that have occurred and to fill the freshman seats on the committee.

XVI.
The Challenging and Voluntary Withdrawal of a Member of the Committee from Participation in a Particular Hearing
An accused person who challenges the right of any member of the Honor Committee to sit in judgment on him or her must present cause to the chair of the hearing.

The hearing committee then decides the validity of the challenge with the challenged member abstaining from voting. A simple majority decides the validity of any challenge. A successfully challenged committee member must not be present during the hearing.

A member of the Honor Committee who feels prejudiced as to the facts of the case, is a close friend or relative of the accused, or would not be able to render an impartial judgment must withdraw from a specific hearing.

Provision for Amendments
Upon petition of 20 percent of the student body, amendments to or revisions of the Honor Code may be proposed for ratification. Said amendments and/or revisions are voted on by the student body as a whole. A two-thirds majority of the votes cast is necessary for acceptance of any amendment or revision.

XVII.

The Honor Committee may also propose amendments to be voted on by the student body as described in paragraph one of this section.

Approved amendments take effect immediately for all new cases. New provisions are not applied to cases initiated prior to the amendments.