

San José State University (1/27/2020)

Economics 103, Introduction to Econometrics, Section 1, SP 20

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Office / Hours:	DMH 131 / Monday and Wednesday, 1:00 - 1:25p.m., & by appointment
Room/ Day/ Time:	DMH 166 / Mondays and Wednesdays / 1:30 - 2:45 p.m.
Prerequisites:	elementary statistics (ECON 3, STAT 95, SOCI 015, UNVS 015S)

Learning Management System

Canvas is the Learning Management System at SJSU. Please be sure you can log in and are receiving my announcements. I will be communicating with the class through Canvas, but if you have a question for me *email me directly*. For info on Canvas visit <https://sjsu.instructure.com>.

Course Description

Covers research methods and core econometric techniques for analysis of causal effects, from difference-in-means tests of experimental data through multiple regression analysis of observational data. Topics in research methods include selecting an appropriate research question, reviewing the relevant literature, and obtaining data. The course concludes with students using core econometric techniques in an original term paper.

Grading and Classroom Policy

This is a 4-unit course. The grading scale is: 60-62, D-, 62-68, D, 68-70, D+, 70-72, C-, 72-78, C, 78-80, C+, 80-82, B-, 82-88, B, 88-90, B+, 90-92, A-, 92-98, A, 98-100, A+. I generally don't allow makeup assignments unless there is sufficient notice and a well justified and documented reason. Disruptive use of laptops during class and food that emits externalities are not allowed.

Required Textbooks

- 1.) Angrist, J. D. and Pischke, J. 2014. *Mastering Metrics*, Princeton University Press, Princeton, N.J.

Resources: www.mastermetrics.com

- 2.) Bailey, M.W. 2016. *Real Econometrics: The Right Tools to Answer Important Questions*. Oxford University Press; 1st edition.

Resources: <https://global.oup.com/us/companion.websites/9780190296827/>

- 3.) Holian, M. J. Forthcoming. *Data and the American Dream: Contemporary Social Controversies and the American Community Survey*. Palgrave Macmillan.

Excerpts from this in-progress manuscript will be provided to students in class.

Recommended Textbooks

- 1.) Stock, J.H. and Watson, M.W. 2011. *Introduction to Econometrics*. Pearson, 3rd edition

This is the book we use in the graduate econometrics sequence, although it is perfectly accessible to undergraduates. Any recent edition is suitable. See also the publisher's Student Resources page for replication files for the book in Stata format: http://wps.aw.com/aw_stock_ie_3/178/45691/11696965.cw/

Required Computer Software

All students must have installed on their home machines 1.) a spreadsheet program (preferably MS Excel) and 2.) a statistical software package (either R and R Studio or Stata). Stata must be purchased through www.stata.com, but R and R Studio can be downloaded for free.

Course and Program Learning Objectives (CLOs and PLOs)

This course emphasizes PLO3: *research methods* and PLO5: *communication*. Specific CLOs for this course include: CLO 1.) Explain basic methods in econometrics and identify correct procedures, and CLO 2.) Prepare a scholarly research paper describing a regression analysis: 2a.) Formulate an interesting and important research question, 2b.) Locate useable data from Internet or other sources 2c.) Search and analyze scholarly literature related to research question, 2d.) Write a literature review, 2e.) Develop a statistical model that can be used with the data to answer a question which contributes to the literature. CLO1 will be assessed through homework and exams, and CLO2 through a term paper.

Assignments

<i>Assignment</i>	<i>Points</i>	<i>Due Dates</i>
2,000 word term paper (due in phases)	40 (5 for outlines, 5 for draft, 7 for presentation, 3 for script & 20 for final)	Outline 2/17, Draft 4/29, Presentation 4/29, 5/4 or 5/6, Final Paper 5/18
Homework Assignments	15	Most Fridays by 5p.m.
Midterm Exams	20 (10 points each)	2/17 and 3/23
Final Exam	25	5/18

Detailed rubrics for the writing assignments may be found at the end of this syllabus. Homework will be assigned in class and students will submit assignments on Canvas. The Midterm and (comprehensive) Final exam cover material from the required readings and homework assignments.

Academic integrity

Cheating on exams or plagiarism (presenting the work of another as your own) will result in a failing grade and sanctions by the University. Faculty members are required to report all infractions. **Note:** The term paper involves a replication and students will find references in the original studies they can use in their literature review sections. However, do not just paraphrase the description of this literature. I will consider too much paraphrasing to be unoriginal and it may result in a failing grade on the term paper, and reporting to the Student Conduct office.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

Term Paper Components and Instructions

You will complete a project with several components that will culminate with a term paper that replicates and extends a previously published article. All students will analyze micro data from www.ipums.usa.org. The studies listed below are discussed and replicated in the book *Data and the American Dream*, are from the contemporary period, and are examples of the types of studies students will locate, replicate and extend. Students are also welcome to use the historical data from IPUMS-USA if they can find a historical study that is a good candidate to replicate.

By **2/17** students will write up an outline that contains your project's title, five sections with section names, a one sentence research question, and a complete bibliographic citation to the study you propose to replicate. Indicate the JEL code for this paper, and why this is a good candidate to replicate. In your outline, list two or more other studies you plan to review in the Literature Review section. In addition, include the regression equation (with variable names) you're replicating, indexing variables to make clear the units of observation (A household? A person?). List one or more ideas for extending the model. Students who do not receive full credit on their outline will have an opportunity to submit a revised outline on **3/23**.

On **4/29**, **5/4** or **5/6** you will make a short presentation, using slides. Your presentation should stress best practices in estimating well-defined causal effects, and your original contribution. The draft is due before class on the day you are scheduled to present, and the final paper is due **5/18**.

After replicating one model from the published paper, you can extend the analysis in any way you like. Your goal should be to estimate a causal effect of relevance to economic theory. Be sure to discuss whether your estimates are credible estimates of causal effects, and any ways in which they may fall short of this goal (there is almost always room for improvement.)

All papers must have five sections: 1.) Intro, 2.) Literature Review & Economic Theory, 3.) Data Description, 4.) Empirical Results, and 5.) Conclusion, as described in Stock and Watson's "Conducting a Regression Study Using Economic Data" (on Canvas, Files > PDFs). Sections will be about five paragraphs in length and each paragraph about five sentences. This "5x5" suggestion is a rule-of-thumb and need not be followed exactly. However, all papers *must* have these three tables: Variable Descriptions, Summary Statistics, and Regression Results. Original figures like maps created with GIS software are encouraged but not required; *all copied figures are prohibited unless cleared with the instructor*. Tables must be formatted exactly as described in class and References (in a Bibliography section) must be in Chicago format. Finally, all papers must write out at least one equation describing an empirical model, and must contain an abstract.

Examples of Good Candidates for Replication in this Class

Bailey, James, and Dhaval Dave. "The effect of the Affordable Care Act on entrepreneurship among older adults." *Eastern Economic Journal* 45, no. 1 (2019): 141-159.

Comolli, Chiara Ludovica, and Fabrizio Bernardi. "The causal effect of the great recession on childlessness of white American women." *IZA Journal of Labor Economics* 4, no. 1 (2015): 21.

Costa, Dora L., and Matthew E. Kahn. "Electricity consumption and durable housing: understanding cohort effects." *American Economic Review*, 101, no. 3 (2011): 88-92.

Holian, Matthew J. "The impact of urban form on vehicle ownership." *Economics Letters* 186 (2020): 108763.z

Holian, Matthew J. "The impact of building energy codes on household electricity expenditures." *Economics Letters* 186 (2020): 108841.

Orrenius, Pia M., and Madeline Zavodny. "The Impact of Temporary Protected Status on Immigrants' Labor Market Outcomes." *American Economic Review* 105, no. 5 (2015): 576-80.

Winters, John V. "Is economics a good major for future lawyers? Evidence from earnings data." *The Journal of Economic Education* 47, no. 2 (2016): 187-191.

Finding Your Own Studies to Replicate

Published studies that are good candidates for replication in this class, like the ones listed above, have two characteristics. First, they contain statistics that were estimated *only* with the micro data from IPUMS and do not require merging on data from other sources.¹ Second, they were estimated with simple or multiple regression models, which are the main focus of this class.²

I have several suggestions for finding studies to replicate. First, search the bibliography at: <https://bibliography.ipums.org/>. All of these studies use the IPUMS micro data in some way, but students will have to determine whether they use merged data or advanced methods. Second, do a "cited reference search" using Google Scholar. For example, search for the following citation:

Ruggles, Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. "Integrated public use microdata series: Version 5.0 [Machine-readable database]." *Minneapolis: University of Minnesota* 42 (2010).

Authors who used this version of the IPUMS data are supposed to cite this study (although not all do.) In Google Scholar, you can see a list of all studies Google knows about that cited any reference by clicking the "button" beneath the reference. As I write this, 2,703 studies have cited Ruggles et al. (2010). Thousands of other studies have cited different versions of the IPUMS data. To find these, I suggest you click the link to Steven Ruggles' Google Scholar author page, where you'll see a list of his most cited studies. Do cited reference searches on these as well.

When you find articles, you will usually need to access them through our university's subscriptions. Our library subscribes to most scholarly journals. Go to <http://library.sjsu.edu/> and click Journal Titles. Enter the journal title. You can do this faster; on Google Scholar, set up "library links" under "settings" to see direct links to articles.

Here are two other options for locating published econometric research: 1.) search the JSTOR database. <http://library.calstate.edu/sanjose/databases/alphabetical?alpha=J>. Limit your search to Econ journals in Advanced Search, and search using keywords in your area of interest; 2.) search the EconLit database (change end of link above from "J" to "E"). You can search by keyword; if you are interested in an area within economics, try also to search by subject (SU) using JEL code: <https://www.aeaweb.org/econlit/jelCodes.php>.

¹ Actually, the Costa and Kahn (2011) study does use merged data. However, like all studies published in the *American Economic Review*, its authors are required to submit replication files. Thus a student who wanted to replicate a study published in the AER would not have to gather merged data themselves. In light of this journal's mandatory research data sharing policy, students should give articles published in the AER special consideration.

² Some studies meet these conditions do not contain credible estimates of causal effects. Such studies can still be good candidates for your replication project, if you can explain how this aspect of the study can be improved.

Term Paper Grading

For Rough Drafts and Term Papers, I'll be looking for the things listed in the table below in each section. Of course following the guidelines of the assignment listed above is important; to repeat, all papers must have: 1.) five sections, 2.) about 25 paragraphs or 125 sentences, 3.) tables of Variable Descriptions, Summary Statistics, and Regression Results, 4.) no copied figures, 5.) References in Chicago format, 6.) an equation describing an empirical model in appropriate notation, 7.) an abstract that summarizes the paper, and 8.) One or more JEL codes.

Grammar is also important. There are formal rules of grammar (Does each paragraph have a topic sentence? Do all sentences develop one controlling idea? Does paper feature appropriate punctuation, syntax, usage? Is the paper free of spelling errors? Are citations used appropriately?) There are also less formal “stylistic” elements of writing: Does paper avoid the passive voice? Overall, is the writing style and voice appropriate? Does it appear the student read contemporary and seminal studies and is it written in the style of the profession?

The best way to learn the style of economic writing is to read economic writing; this suggests you should try to actually read the journal articles and book chapters you review in your literature review section, not just the abstracts. You can also consult various guides to style and writing. In addition to the McCloskey (1985) article that will be discussed in class, a book-length treatment that is widely used across fields is Strunk (2007) *The elements of style*.

For outlines, rough drafts and final papers, the percentages listed below each criteria are the approximate weight of each section towards your final grade. The difference between the assignments, essentially, is just the level of completeness—an outline may not feature any results, a draft will have results but the writing will be incomplete, and a final paper will be a complete academic-style term paper.

Criteria	Description of Criteria for Rough Drafts and Term Papers
<i>Intro</i> 5%	Reveal the research question to the reader clearly and at the outset. Motivate interest. Describe what this paper does (i.e. how you answer the research question), the main findings, and how the paper is structured.
<i>Literature Review and Economic Theory</i> 40%	This section should describe the relevant theory that is behind the hypotheses tested in past econometric studies. You may be able to describe the theory so precisely that you include a formal mathematical model in this section, but a clear qualitative description of formal theory would be enough. Discuss at least ten econometric studies, noting which of the ten studies provides the single best discussion of the estimation of the causal effect of interest. Explain why (i.e. discuss ways the state-of-the art study handles a well-defined econometric problem such as Omitted Variable Bias.) <i>The literature review must be integrated and not merely an annotated bibliography.</i>
<i>Data and Methods</i> 25%	Describe the data; even though I am grading it and I know where the data comes from, write it for a more general audience. Describe the estimation subsample, and present the tables of Variable Descriptions and Summary Statistics. Present the equation you will be estimating here.
<i>Results</i> 25%	Present regression results in a table with several models in different columns. Indicate in the text which of the models is your best attempt at replicating the previously published model. Also indicate which is the best attempt to estimate a causal effect (this may be your extension.) Interpret the results for the reader in terms of the sign, magnitude, economic and statistical significance, as well as the implications for the theory discussed in section 2.
<i>Conclusion</i> 5%	Overall, your paper should aim to discuss a specific causal research question that relates to a relevant economics literature. Acknowledge any limitations. Suggest directions for improvement in future research. Discuss policy implications and how your results can be used in a cost-benefit analysis, if applicable.

Course Schedule *(To be updated periodically; note date on first page of this syllabus.)*

Date / Location	Topic	Readings assigned for next class
27-Jan / DMH	Intro to Econometrics and Research Methods; Statistics Review	AP Intro & pp. 33-46; Holian Appendix
29-Jan / CCB	Statistical Computing and the American Community Survey	Holian Ch 1
3-Feb / DMH	Difference in Means and Regression	AP Ch 1
5-Feb / DMH	Experimental Methods	AP Ch 2
10-Feb / CCB	Regression	AP Ch 2 Appendix (pp. 82-97)
12-Feb / DMH	Regression Continued	
17-Feb / DMH	MIDTERM 1 1st OUTLINE	
19-Feb / CCB	Midterm 1 review and discussion of outlines	Bailey Ch 1
24-Feb / DMH	The Quest for Causality	Bailey Ch 2
26-Feb / CCB	Good Data Practices, and Replication	Bailey Ch 3
2- Mar / DMH	Regression with Two Variables	Bailey Ch 4
4- Mar / DMH	Hypothesis Testing	Bailey Ch 5
9- Mar / CCB	Regression with More Than Two Variables	Bailey Ch 6 and Section 12.1
11-Mar / DMH	Dummy Variables	Bailey Ch 7
16-Mar / CCB	Functional Form of Regression Equations	
18-Mar / DMH	Exam Review	
23- Mar / DMH	MIDTERM 2 2nd OUTLINE	
25- Mar / DMH	Midterm 2 review and discussion of revised outlines	Bailey Ch 8 (AP Ch 5 is recommended)
6-Apr / DMH	Advanced methods: Difference-in-differences	Holian, Ch 2, 3 or 4 (select one only)
8-Apr / CCB	Applications with Difference-in-differences	Bailey Ch 9 (AP Ch 3 is recommended)
13-Apr / DMH	More advanced methods: Instrumental variables	Holian Ch 5
15-Apr / CCB	Applications: Instrumental variables and multiple regression	Bailey Ch 10
20-Apr / DMH	Experiments revisited	Holian, Ch 7
22-Apr / CCB	Using Econometrics in Decision Making: Cost-Benefit Analysis	
27-Apr / DMH	Exam Review; Term Paper and Oral Presentation tips	
29-Apr / DMH	Student Presentations ROUGH DRAFT	
4-May / DMH	Student Presentations ROUGH DRAFT	
6-May / DMH	Student Presentations ROUGH DRAFT	
11-May / DMH	Review for Final Exam	
18-May / DMH	FINAL EXAM @ 12:15p.m. FINAL PAPER	

Additional References

Writing a Literature Review Section, video produced by the SJSU Library.
<https://library.sjsu.edu/video/writing-literature-review-section>)

Stock, J.H. & Watson, M.W. "Conducting a Regression Study Using Economic Data"
<https://wps.pearsoned.com/wps/media/objects/11422/11696965/stoc2517.ch10.343-350.C1.pdf>

McCloskey, D. (1985). Economical writing. *Economic Inquiry*, 23(2), 187-222.