PPA 207 – QUANTITATIVE METHODS

GRADUATE PROGRAM IN PUBLIC POLICY AND ADMINISTRATION
CALIFORNIA STATE UNIVERSITY, SACRAMENTO

SPRING 2007

Professor: Rob Wassmer, Ph.D.

E-Mail: rwassme@csus.edu

Home Page: http://www.csus.edu/indiv/w/wassmerr

Class Times, Location, and Dates: Saturday, 9 a.m. to 3:00 p.m. (an extra ½ hour is added so we do not need to meet on March 24) – location to be announced – February 3, 10, 17, 24; March 3, 10, and 17; and a scheduled 15 minute meeting in my office to discuss your paper topic before March 17.

Office: Room 3037, Tahoe Hall

Office Phone: (916) 278 - 6304

Office Hours: Thursday, 3:00 - 5:45 p.m.; at lunch during Saturday classes, and by appointment if necessary.

Texts:

Please purchase all texts and review them before first meeting. You are expected to do the assigned reading before it is covered in class. Bring appropriate text(s) to class on the dates covered.

(1) An SPSS Companion to Political Analysis, Second Edition, Philip H. Pollock, CQ Press (labeled as POL); available for purchase at CSUS Bookstore or click to buy on web at Amazon.com (click on the previous link to purchase);

(2) Using Econometrics: A Practical Guide, 5th Edition, A.H. Studenmund; Addison, Wesley, Longman (labeled as STUD); available for purchase at CSUS Bookstore or click to buy on web at Amazon.com (click on the previous link to purchase);

(3) SPSS Base 14.0 (Graduate Pack): Applications Guide and CD-ROM; this can be purchased at the CSUS Bookstore in their computer department or if you chose to use computers in university labs that have it installed you will not need to purchase it.

Supplement:

Take a look at the companion web site for the Studenmund book - http://www.aw-bc.com/studenmund/. It provides student study resources and data sets used as examples throughout the text.
Prerequisite:

The requirement for taking this course is the previous completion of Stat 1 (labeled as such in the CSU or CA Community College systems) or an equivalent course. For a quick review of the material covered in a typical Stat 1 course see Chapter 16 in Studenmund.

Data Sources:

We will use data sets throughout the semester for class examples and you will need one for your term paper. Some of them are on the CD that is included with the Pollock book, others are listed below. It is very wise to start early in putting together a data set for your course paper.

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<thead>
<tr>
<th>Data Type</th>
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<tr>
<td>California Academic Performance Index Scores for Public K-12 Schools</td>
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</tr>
<tr>
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<td>I can provide CD.</td>
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<td>California Field Polls</td>
<td><a href="http://gort.ucsd.edu/calpol/">http://gort.ucsd.edu/calpol/</a></td>
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<tr>
<td>Various California Data</td>
<td><a href="http://countingcalifornia.cdlib.org/">http://countingcalifornia.cdlib.org/</a></td>
</tr>
<tr>
<td>Public Policy Institute of California Survey Data</td>
<td><a href="http://www.ppic.org/main/datadepot.asp">http://www.ppic.org/main/datadepot.asp</a></td>
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<tr>
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<td><a href="http://www.econdata.net/">http://www.econdata.net/</a></td>
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<td><a href="http://www.nber.org/data/">http://www.nber.org/data/</a></td>
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<td>Data on the Net</td>
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</tbody>
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WebCT:

This course is structured such that you must have an account that allows access to the World Wide Web and WebCT. If you do not have an account at home or work, you can get one through CSUS. On WebCT I will post an outline of material covered in each meeting and a description of the homework that is due at the following meeting. These will be available, at the latest, the Tuesday before the class meets. All your grades will be accessible through WebCT. Information on WebCT can be found at https://online.csus.edu/.
Learning Objectives:

At the end of PPA 207 it is expected that a student attending all meetings will:

(1) Have a working knowledge of where to begin to gather data for policy analysis.

(2) Possess the ability to accumulate data and do basic descriptive analysis of it using a spreadsheet program and a more advanced statistical program (SPSS).

(3) Understand the importance of causal modeling before undertaking a statistical analysis.

(4) Understand the appropriate use of bivariate and multivariate statistical techniques that help to identify causal relationships between variables.

(5) Have a working knowledge of regression analysis and the value it offers to answer many policy questions.

(6) Be able to put together a research paper that describes a policy problem and undertakes a regression based research study to offer a solution.

The purpose of this course is to expose the graduate student of public policy to some of the empirical methods used in the analysis and formulation of government policies. These include descriptive statistics, types and sources of data, distributions of data, regression analysis and interpretation, and some of the basic issues/problems that can arise in regression analysis. My goal is not to turn you into an expert on statistical and regression theory, but I do wish to provide you with a working knowledge of the most basic applied techniques. Even if one expects to never apply these techniques directly in their anticipated career path, it is very likely that they will be required to interpret and comment on reports that contain policy analyses based on these techniques.

Method:

Pedagogy will be equally focused on in-class meetings and discussions, required assignments out of the Studemund and Pollock books, and assignments using SPSS and the provided data sets. Each week students will be required to complete written answers to HW questions related to the readings. We will go over assignments at the meeting that they are due.

Each class meeting will begin with discussion and collection of the previous week’s HW assignment. Only the student who completed the assignment can turn it in (my method of attendance). After 90 minutes (10:30 a.m.) we will take a 10-minute break and then return (at 10:40 a.m.) for an additional 90 minutes of meeting (until 12:10 p.m.). At that time we will take a lunch break until 1:00 p.m. and then conclude with a final 120 minutes of class (much of it interactive with you working on computers) until 3:00 p.m. There is an extra half hour added so we do not need to meet the last scheduled day of the class.
In-class time will be devoted to covering the use of the Excel and SPSS computer packages at computers you will have access to. It is also most important that you use these packages at home to get hands-on experience with the methods discussed in this class. Computer assignments will be due every class period. If possible, the optimal situation is to install the purchased software on a home, work, or friend’s Windows compatible personal computer that you have access to.

Schedule:

This class meets a total of seven times throughout the semester. You will also need to visit me in my office for a private 15 minute discussion of the plan for your paper and the progress you have made on it.

There will be no midterm exam. Instead I will use the exercises that are due at the start of each class meeting to judge your progress throughout the semester. The final exam is a paper that is due at the latest on May 4.

The readings out of Studenmund (STUD), Pollock (POL), and others are given below. Some of these links may only be accessed through the use of a SacLink account.

**Meeting 1 – February 3**

STUD 1 - An Overview of Regression Analysis
STUD 2 - Ordinary Least Squares
STUD 3 - Learning to Use Regression Analysis
POL Getting Started
POL 1 - Introduction to SPSS

Learning Excel (review if you feel weak in using a spreadsheet) - [http://www.usd.edu/trio/tut/excel](http://www.usd.edu/trio/tut/excel)

Wassmer, Lascher, and Kroll - “State and Local Government Revenue and Expenditure as Determinants of Individual Happiness”

**Meeting 2 - February 10**

Urbanized Area Data Set - I will provide
STUD 4 - Classical Model
STUD 5 - Hypothesis Testing
POL 2 - Descriptive Statistics
POL 3 - Making Comparisons
POL 4 - Transforming Variables in SPSS
Meeting 3 - February 17
STUD 6 - Choosing the Independent Variables
STUD 7 - Choosing a Functional Form
POL 5 - Making Controlled Comparisons
POL 8 - Correlation and Regression
POL Appendix

Meeting 4 – February 24
STUD 8 – Multicollinearity
STUD 9 - Serial Correlation
POL 6 - Making Inferences about Sample Means


Meeting 5 – March 3
STUD 10 - Heteroskedasticity
STUD 11 - Regression User’s Handbook

Paper Requirements - http://www.csus.edu/indiv/w/wassmerr/ppa207pa.htm


POL 7 - Chi Square

Meeting 6 – March 10
STUD 13 - Dummy Dependent Variable Techniques
POL 9 - Dummy Variables and Interaction Effects
POL 10 – Logistic Regression


Meeting 7 – March 17
STUD 14 - Simultaneous Equations
POL 11 - Doing Your Own Analysis


(Handout) – Jane Miller, “Writing for Applied Audiences”

May 4

LAST DAY TO TURN IN FINAL PAPER

Paper:

In order to receive a grade in this course, each student is required to complete a regression-based paper (15-25 double-spaced pages) on the topic of their choosing. You will need to gather data for this paper on your own. Details on what needs to be included in the paper will be given in class. The paper should follow the format prescribed in the handout that I provide. The student papers listed above are excellent examples to look at.

Grades:

You are required to participate in class discussions and complete the homework assigned. A total of 6 homework assignments are required – there is none due the first meeting. Your written answers to homework will be assigned grades ranging from A+ (4.3) to F (0.0 - for not completing). A separate grade for each homework assignment will be given and a total average derived.

The paper you are required to complete accounts for 45 percent of your final grade, the average of all homework assignments account for 45 percent of your final grade, and your participation in class is 10 percent. You must complete the paper to pass the class.
### Scoring for Homework:

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PPA 207 CHECKLIST FOR FINAL PAPER

Professor Rob Wassmer, Public Policy and Administration, CSUS

Your grade will be based upon how well you satisfy the items on this list. You must turn in final draft of paper on May 4. Each day it is late will result in a one lower grade deduction.

OVERALL

- There is a cover page with title, your name, and date handed in. ___
- The seven major sections in your paper are marked by roman numerals and heading titles. ___
- The first paragraph of each major section contains an introductory paragraph that briefly describes what is in it. ___
- Sub-sections within your paper contain headings. ___
- There are no spelling errors. ___
- There are no grammatical errors. ___
- Transitions between paragraphs are smooth. ___
- One inch margins, 11 font, and double-spaced. ___
- Includes a list of references at end of paper in APA style. ___
- For all style issues use the APA style given in Hacker’s A Pocket Style Manual. APA style is also described at http://owl.english.purdue.edu/handouts/research/r_apa.html . ___
- The audience for your paper is an educated layperson who works in public policy and explanations are done appropriately. ___

I. EXECUTIVE SUMMARY (1 – 2 pages)

- Follows the example described in Miller, “Writing for Applied Audiences,” p. 405. ___

II. INTRODUCTION (2 - 3 pages)

- The first paragraph clearly contains your research question. What are you trying to discover through regression analysis? What is (are) the key explanatory variable(s)? ___
- The remainder of your introduction motivates the reader to continue by placing your question in the context of current events, and public policy and studies. ___
- Cite at least two newspaper or magazine articles that point out the populist importance of determining the impact of your key explanatory variable(s) on the dependent variable. Use search engines like http://www.sacbee.com/, http://www.latimes.com/, and/or http://www.sfgate.com/ . ___
- The last paragraph contains a description of what is contained in the remaining five sections. A one-sentence description for each section is appropriate. ___
III. LITERATURE REVIEW (2 - 3 pages)

- Contains a description of at least at least three other pieces of academic research in the area. You can find this research by searching at the CSUS Library’s Web Page of literature bases that must be accessed on campus or using a SacLink account (http://library.csus.edu/databases/). I would suggest using ECONLIT and EBSCOhost as two literature sources that will have regression studies in them. Search using keywords that include "regression" and your topic. Be sure that 2/3 of the articles you choose use some form of regression analysis.
- Divide your literature review into two themes (or subsections). The first is what can be learned from the academic research that applies to your proposed study (i.e., what is done right and what is can be improved upon in the pieces of research you examined). The second is the conclusion/findings of these studies and how you expect them to compare to yours.

IV. MODEL (2 - 3 pages)

- Offer a motivation for your choice of a dependent variable. How does it relate to your research question?
- Include a description of the factors expected to cause your dependent variable. The factors should first be listed as broad causes (say causes A, B, C, etc.) and the specific variables which represent broad causes \( A = f(x_1, x_2, x_3) \), \( B = f(x_4, x_5) \), \( C = f(x_6, x_7, x_8) \), etc.
- What variables do you use to specifically proxy for each of the broad causes? Justify your choices.
- Write the regression model to be estimated as: \( Y = f(x_1, x_2, x_3, \ldots) \); substituting your specifics for \( Y, x_1, \) etc.
- Do not use acronyms to describe \( x_1, x_2, \) etc., instead write out a short 3 to 5 word description.
- What is the expected direction of effect for each of the specific causes (positive, negative, uncertain)? Justify with a verbal cause and effect description.

V. DATA (2 - 3 pages)

- Create a Table 1 that provides description and source for each variable used. (No direct SPSS results allowed for any tables. Create tables in your own form and be consistent throughout. Place title on all tables.)
- Create a Table 2 that provides variable name, mean, standard deviation, maximum, and minimum.
- Create a Table 3 that provides simple correlation coefficients between all independent variables.
- Describe in paragraph form what is in Tables 1 – 3.

VI. REGRESSION ANALYSIS (2 - 3 pages)

- List your regression results in table form. (No direct SPSS results allowed.)
First give your starting OLS results with no corrections. If possible, this should begin with the log-log form. If not possible, begin with log-linear, or as last choice linear-linear form.

If possible, try running log-linear and linear-linear specifications. If fit better than your first choice, report it and use it in remaining corrections.

Discuss how you checked for multicollinearity. Was it an issue, and if it was, how you corrected for it? Be sure to include VIF values.

Did you try including location or other dummies where appropriate? Is it appropriate to try any interaction terms? Discuss your findings.

Check for heteroskedasticity in your regression by presenting and describing the Park Test. If present, provide the appropriate new results.

If your dependent variable is dichotomous (0 or 1). Report both OLS and logit regression results. Describe what both mean and which of the two is more appropriate.

Is endogeneity an issue for any of your casual variables? If not justify why you believe so. If it is, tell why and describe how you would correct using 2SLS. Report these results. (Extra Credit)

VII. CONCLUSION (2-3 pages)

Considering your final regression result (with all the appropriate corrections), turn regression coefficients into 90% confidence intervals and equivalent elasticities and report them. (Or the appropriate measure if using logit.)

Discuss which of your coefficients are significant at 90 and 99 percent confidence interval.

For your significant coefficients, how do they compare to the expected signs you described in model section? If findings are different, give a reason why it may be the case.

For your significant coefficients, describe the relevance of variable in regard to the magnitude of its elasticity.

Interpret the R-Squared.

Evaluate your research question. What does your regression results indicate in regard to it?

What are the specific policy lessons to be learned from your results? Revisit the policy questions you raised in your introduction.

Suggest improvements that you would undertake if you had the time. Is there potential here for a Master’s Thesis?