Tips for EC3090 Project

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July, 2012

1 Overview

The presentation in week one of Hilary Term is worth 5% of the overall year's mark for EC3090 Econometrics. In presenting your chosen research topic to your peers, marking will depend on ability to clearly communicate the research question and chosen methodological approach. The applied research project of between 2000 and 3000 words is worth 15% and marking will depend on the following:

- Formulation – research question and economic model.

- Accuracy – chosen econometric approach.

- Rigour – testing and correcting for misspecification errors.

- Interpretation / discussion of results.

- Written English – format, consistency and linguistic accuracy of the written paper.

In your study, the sample size must contain at least fifteen observations. It also must be the case that your econometric investigation is conducted as a multiple regression

$$y_i = f(x_i) \quad i = 1, \ldots, n \quad n \geq 2$$

Include the results of your regression exercise in the body of your report and relegate detailed data and results to the appendices. A typical report should contain the following sections:

1. Introduce your chosen equation, any relevant theory and the main empirical question you are trying to answer.

2. Discuss your datatype, its sources and quality.

3. Present and discuss your regression results.

4. Comment on your main conclusion and any policy relevance.

As a minimum for empirical work, you must do and report on the following:

- With time-series data, plot Y, X_1 and X_2 against time.

- Plot Y against X_1 and – separately – Y against X_2.

- Regress Y on X_1, Y on X_2 and Y on X_1 and X_2 together.

- Draw the estimated lines from regressions of Y on X_1 and Y on X_2 on the appropriate graphs.

- Plot Y against the fitted Y from the multiple regression of Y on X_1 and X_2.

- Comment on R^2, and on the t and F statistics in your multiple regression.

- Comment on multiple regression diagnostics, in particular the Durbin-Watson test and tests for non-normality, heteroscedasticity and functional form.

- Construct a 95% confidence interval for at least one of your coefficients of interest.

- Use your estimated model to make a forecast.

The following references can be *very helpful*:

- Student Economic Review.

- Gujarati [2] 5.11 & 5.12 and Wooldridge [3] chapter 19: in carrying out, evaluating and reporting your regression analysis.

- Franses [1]: ideas for topics and in particular chapter 3 (especially the section on data) and chapter 4 (illustrative case studies).

- New Palgrave Dictionary of Economics.

2 Notes on Wooldridge Chapter 19

From a reading of Wooldridge Chapter 19, I have broke down what I consider to be important. This may or may not be of benefit to you. However, it should not be interpreted as a substitute for Wooldridge's Chapter 19.

2.1 Posing a Question

- Be specific; ensure you can get data; make sure it's interesting (see examples in book); could be locally based, does not necessarily have to be original but it could be.

- Be descriptive: make it interesting; once you've decided on the area of research, can you find any specific papers on the topic? Look up JEL and EconLit.

- Discuss your ideas with others while formulating your question; you should be able to convince them it is interesting and well-defined (specific).

2.2 Literature Review

Check EconLit and other references. Include a review of the relevant literature. Read abstracts to know how relevant the papers are to your own work. If the literature review is long then put it into its own separate section, but if it is short then put the literature review into the introduction.

2.3 Data Collection

- Decide on the appropriate data set: see the book for some issues involved; authors sometimes provide datasets and plenty of datasets can be obtained on the internet; some datasets, in particular historical ones, are only available in printed form, however – this could cause issues meaning it takes time to input your data!

- Entering and storing your data: see the book for a discussion of etiquette, rules and conventions you should follow, problems you can encounter, missing values, etc. This is a very good section.

- Familiarise yourself with your dataset; have a look at the solutions in the book; also see examples of reporting minima, maxima, standard deviations, data manipulation and time series.

2.4 Econometric Analysis

This very briefly goes through some checks you can do and while is not a revision of the methods you have been learning this year, it is a good reminder of some checks you should carry out, e.g. OLS, functional forms, heteroscedasticity, misspecification analysis, sensitivity analysis (do your important conclusions change when you slightly modify your model), dealing with outliers, data mining, etc.

2.5 Writing an Empirical Paper

1. Intro: objectives and why important; literature review (what has been done and how can we improve the current state of play); simple summary; simple statistics / graphs suggesting relationships.

2. Conceptual theoretical framework: approach to answering questions posed in the introduction; presentation of the formal economic theory or an intuitive discussion of problems.

3. Econometric models (firstly) and estimation (secondly, e.g. OLS / GLS): show your assumptions (e.g. how do you measure the quality of schooling), functional forms, etc.

4. Data: refer to your data and if you have a short data set then consider attaching it to the appendix, define your variables (units) and keep the

same names for your variables here as will be in your results section; provide summary statistics for each variable, number of observations, number of cross sectional units / any special years if doing time-series, etc.

5. Results: initially you might want to report results of a simple analysis before showing how this analysis does not control for important factors; present at least one table especially if you have lots of equations, e.g. R^2, n, adjusted R^2, etc.; interpret the sign and the strength (magnitude), detail statistical significance and distinguish between statistical and economic significance; look at special cases of the model (see examples in book); if you use different methods of estimation, comment on any crucial differences.

6. Conclusion: summarise your paper adding caveats at the end and suggest further research.

2.6   Style

Tips here regard the topic title, how it is typed (double-spaced, equation centered and on a new line), having large tables/graphs just after the body of text and ensuring you reference papers by author and date, e.g. (Keynes, 1936). Focus on important or key dependent and independent variables (see how Wooldridge does this by rewriting equations using $\mathbf{x}\delta$. State what you are doing. Choose units so that the coefficients are not too large or small – do not use scientific notation. Only report very special commands in the appendix, where you can also include extra, non-central but supportive analysis.

References

[1] Franses, P.H. (2002). *A Concise Introduction to Econometrics*. Cambridge: Cambridge University Press.

[2] Gujarati, D.N. (2003). *Basic Econometrics*. New York: McGraw-Hill.

[3] Wooldridge, J.M. (2013). *Introductory Econometrics: A Modern Approach*. 5th edition, Cengage.