Satisfying the Research Paper Requirement for the Minor in Quantitative Methods

The following are rough guidelines for the research paper requirement for the minor in quantitative methods. Students have a good deal of flexibility for meeting the requirement and the choice of topic and the decision concerning the degree of methodological sophistication should be made in close consultation with the faculty members who have agreed to serve as examiners. The purpose of this document is to give students and faculty an idea of what is and is not above the bar to qualify for the research minor and to outline the procedure for satisfying the requirements. However, it is important to emphasize that each project is unique and the details must be worked out between the student and the examination committee.

Appropriate Projects for the Minor in Quantitative Methods

Students are not permitted to submit papers that they have written previously to satisfy other requirements. A significant extension of a previously existing paper is appropriate, as long as the methodological component of the paper is new. While the project can and should be part of the student’s general research agenda, it must push that agenda forward by addressing issues in a way that is methodologically innovative (at least in terms of what the student has done before). The burden is on the student to articulate—when proposing the project to the examining committee—how the paper is an advance over any existing work the students may have done.

The following types of papers are appropriate:

- **Applied Quantitative Paper.** The modal project for the methods minor is an applied quantitative paper. That is, the student analyzes a data set to address a question of substantive interest to political science using a sophisticated quantitative methodology. To qualify for the minor, the paper should generally involve methods that are more sophisticated than what is covered in POLS 4910 and 4911. Some of the more complicated estimators covered in POLS 4912 may be appropriate. While students may focus on results obtained with more basic methods, they should defend the appropriateness of these methods relative to more sophisticated methods by discussing robustness checks and statistical tests. In other words, employing more basic methods is appropriate if a reasonable range of more sophisticated methods are demonstrated to be unnecessary. Discussion of the benefits and costs of alternative estimators and approaches should be an essential part of any methods paper.
Beyond model fitting and estimation, applied papers that involve innovative techniques for graphical analysis and model understanding are also appropriate. In these cases, more basic estimation methods may be adequate because the sophistication lies in interpreting results and conducting inferences.

Applied papers that involve innovative research designs may also focus on more basic methods, particularly if the design obviates the need for more sophisticated methods. Adequate methodological knowledge is demonstrated at the front-end by the design rather than the back-end of the analysis. For example, papers that involve lab or field experiments should not require complicated quantitative methods if the experimental design is done well.

• **Applied Formal Papers.** A paper that derives and solves a formal model is also acceptable. The formal model should be one that is more sophisticated than the basic models covered in POLS 4209. For example, solving a prisoner’s dilemma is clearly not above the bar. That said, the level of sophistication can be lower if the use of a proposed simpler formal model highlights interesting predictions or correlations that would not have been easy to establish without a formal model. In other words, a model will be considered useful if it has “heuristic power” by making statements and logical connections that no one has made before without the use of such an instrument.

• **Applied Formal Papers with Quantitative Testing.** If an applied paper involves the combination of the derivation of a formal model and a quantitative empirical test of that model, the level of sophistication for each of these components can be lower than what would be acceptable for papers that employ only one of these approaches.

• **Theoretical Quantitative Papers.** Papers that derive new estimators or new statistical tests of relevance to political science are generally above the bar. Papers that make original contributions in terms of the theoretical evaluation of the performance of methods that are of relevance to political science are also appropriate. These types of papers need not involve the analysis of a real data set. For example, simulated data in Monte Carlo experiments may be used to demonstrate the usefulness of the methods under investigation.

**Procedural Details**

Students must complete all requirements for the minor, including a successful defense of the proposal, by the second Friday of classes in the 6th semester. This includes revisions to the paper, or a second attempt at passing the oral defense. The initial defense of the research paper should be scheduled well in advance of this deadline to allow students to make revisions and possibly re-defend the paper if necessary. Students are advised to begin work on the paper prior to their third year. Although the graduate rules imply that the paper is to be done after all coursework for the minor has been completed, students are encouraged to begin work on the paper prior to this. If students want to employ a method that is covered in a course they have yet to take,
they should consult with the faculty member who teaches the course concerning their interests in using the method.

The student is to confer with his/her faculty committee up until the point where the proposal for the research paper is approved. Then the student will work independently from the committee to execute the analysis and complete the draft of the paper for the oral examination. While it may seem odd that a student is not allowed to consult with faculty during the time when the main component of the research and writing of the paper will take place, this is necessary to maintain the integrity of the paper as constituting an examination of the student’s knowledge and understanding of the subfield.

While it is not possible to give a specific length for the exam, it is safe to say that the methods minor oral exam should take somewhat longer than an oral for a minor in one of the four major subfields. The examiners should assess the student’s competence not only with respect to the paper but also with respect to the field of methodology in general. Although the paper forms the basis of the discussion, more wide ranging questions about methodology can and should be asked.

**Sample methods papers**

In order to get a better idea of what is appropriate for the methods paper, students may consult samples of successfully defended papers that have been placed in a binder located at the graduate coordinator’s desk.