PUAF 689Q: Quantitative Research Methods for Evidence-based Policies

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This is a one semester course covering statistical methods necessary for rigorous analyses of data for formulating evidence-based policies. PUAF689Q will prepare students for further quantitative methods courses such as PUAF798R by going through some of the details of estimators and statistical tests. In addition, students will work with real data and learn how to formulate empirical models for addressing policy questions. The overall grade in the course will be based on three assignments during the semester. The assignments will require data analyses using Stata and the students will be expected to specify models and interpret the empirical results. There is no required text; the book *Introduction to Econometrics* by G.S. Maddala and K. Lahiri (Wiley, 4th edition, 2009) will be useful. A tentative outline of the course, which may be modified to accommodate students’ preferences, is as follows:

1. Review of basic matrix theory and asymptotic distribution theory.

2. Derivation of Ordinary Least Squares estimators for the multiple regression model and extensions for tackling heteroscedasticity and autocorrelation. Diagnostic tests for model adequacy will be covered. The first homework assignment will test students’ understanding of the theoretical issues.

3. The principle of maximum likelihood estimation and applications to dynamic regression models. The second assignment will require students to estimate aggregate consumption functions using time series data for the U.S. The data will be provided in Stata; students will apply regression techniques and diagnostic tests for model adequacy and policy analysis.

4. Random and fixed effects estimators for longitudinal data. The third assignment will be an empirical investigation of issues of child mortality in developing countries using data from the World Development Indicators that will be provided in Stata.

5. Probit and logistic regressions and their applications; a detailed analysis of a demographic data set will be discussed in class for illustrating the various issues involved.

6. Policy evaluation: Conceptual issues in designing and implementing randomized controlled trials and their limitations. Some policy examples will be presented.

The data sets necessary for the empirical assignments will be provided in Stata; Ms Xiayun Tan (tan@umd.edu) will help students with data and estimation issues. Students will be expected to interpret the empirical results for formulating evidence-based policies.