Empirical Implications of Theoretical Models (EITM)
2008

Instructors: Jim Granato and M.C. Sunny Wong
Date: August 4 — 15 (two week course / 35 hrs)
Time: 2:15pm – 5:45pm

Course Content: One purpose of scientific inquiry is to use a set of plausible facts or axioms, model them in a rigorous mathematical manner, and identify causal relations that explain empirical regularities. With this in mind, the purpose of this course is to demonstrate how to merge formal and empirical analysis; that is, to examine the empirical implications of theoretical models (EITM). A function of EITM is to ensure that one meets the minimal requirement that a theory and its test are related.

Course Objectives: This course will demonstrate several ways to do EITM research. Examples will relate social, behavioral, and economic (SBE) concepts (expectations, learning, and social interaction) to applied statistical concepts (persistence, measurement error, and simultaneity). Students will be introduced to the various techniques and devices (analogues) for both SBE and applied statistical concepts, and how they can be linked.

Course Instruction: Course instruction involves the use of modules. Each module is self contained. Each teaching module is conducted in four stages.

Stage 1: The article/chapter(s) are reviewed and their formal and statistical concepts and analogues are identified.
Stage 2: Students are given exercises to develop a basic understanding in the use of the identified formal/statistical concepts and analogues.
Stage 3: Students are instructed on the linkage between the formal/statistical concepts and analogues.
Stage 4: With stages 1-3 complete, students “lecture” the instructors on the example article/chapter(s) introduced in the module.

Course Prerequisites and Tools Used: In the social sciences, the unification of formal and empirical analysis is at an early intellectual stage. We will use articles and book chapters (from various disciplines) that assist in developing approaches that unify formal and empirical analysis. The expectation is that students will develop and use these tools --- and this way of thinking --- to investigate their specific substantive questions. These tasks require that participants have a working familiarity with introductory econometrics, algebra, matrix algebra, and calculus. This background allows students to apply the following analytical and statistical tools:

- Stationary Time-Series Models and Persistence
- Elements of Game Theory and Decision Theory
- Multi-equation Time-Series Models and Simultaneity
- Cointegration and Error-Correction Models
- Error-in-Variables Regression
- Discrete Variable Analysis
- Elements of Bayesian Analysis
- Conditional Expectations Modeling and the Rational Expectations Hypothesis
- Adaptive Learning: Expectational Stability Conditions
Overview: The Scientific Justification for EITM

Reading (#: Required Reading):


Module 1: Relating Intuition to Formalization with Applications to Social Science Questions

EITM Linkage: Concept Linkage to Measurable Analogues

Reading (#: Required Reading):

Module 2: Economic Voting and Economic Outcomes

EITM Linkage: Expectations/Signal-Extraction (Measurement Error) and Error-in-Variables Regression

Reading (#: Required Reading):


Module 3: Public Opinion and Economic Policy

EITM Linkage: Expectations and Persistence

Reading (#: Required Reading):


Module 4: Information Processing and Information Sharing

EITM Linkage: Social Interaction, Learning, and Simultaneity

Reading (#: Required Reading):

Module 5: The Decision to Participate in Public/Political Processes

EITM Linkage: Learning and Discrete Outcomes

Reading (#: Required Reading):


Module 6: International Conflict and Cooperation

EITM Linkage: Game Theory/Strategic Interaction and Discrete Outcomes

Reading (#: Required Reading):


Module 7: Choice under Uncertainty

EITM Linkage: Decision Theory/Utility Maximization and Discrete Outcomes

Reading (#: Required Reading):

Selected Supplemental Technical Reading

Overview:
The Scientific Justification for EITM

Reading (#: Required Reading):