

Empirical relationships

- What is econometrics? Broadly defined, the study of econometrics is the study of economics using statistical methods. Founding members of the Econometric Society described it as: “.. as the quantitative analysis of actual economic phenomena based on the concurrent development of theory and observation, related by appropriate methods of inference”. Samuelson, P., Koopmans, T. and Stone, R., Report of the Evaluative Committee for Econometrica, *Econometrica*, 1954, p.142.
“.. econometrics is by no means the same as economic statistics. .. Nor should econometrics be taken as synonymous with the application of mathematics to economics. Experience has shown that each of these three view-points, that of statistics, economic theory, and mathematics is necessary, but not by itself a sufficient, condition for a real understanding of the quantitative relations in modern economic life. ... Statistical information is currently accumulating at an unprecedented rate. But no amount of statistical information can by itself explain economic phenomena.” Frisch, R. Editorial, *Econometrica*, 1933, p.2.
- When we read the newspaper, or listen to the latest announcement of economic statistics, or predictions, how are the statistics or predictions derived? How we measure a particular economic variable, or how we build an economic model is an art, an art in using statistical methods so that we can relate to the economic processes under examination. For example, lets say that we read in Wall Street Journal that the unemployment rate has dropped a couple of percentage points from 5.6 to 5.4, what does this mean? Who is unemployed? How did we define someone as being unemployed? How did we measure the number unemployed? What techniques would we use if we wished to predict what unemployment will be in the next quarter? We will use, in this course, something that may help in your choice of what to do next year - what is the return from investing an extra year in school?
- Econometrics is a ‘doing’ subject. It is no good reading through the text and thinking that you have a grasp of what econometrics is. Econometrics is an art, an art that has to be learned through practice. Practice includes working through problems using algebra, but is also includes using economic data, and building a model using computer software. There is no ‘right’ or ‘wrong’ way to construct an econometric model, only a sense of reason as to whether the model actually represents economic processes in a sensible manner. There must always be an appeal to economic reasoning in an econometric model.
- What do I want you to take away from the lecture course? The objective of this course is to provide you with some knowledge of econometrics, both in theory, and in its application. In terms of applying the econometric theory you will be using computer software (Microsoft EXCEL). This should be available on the campus at computer labs. Some of you may have access on your home machine.
- Going to examine the relationship between years of education and earnings. Theory comes from Becker, G. S. Human Capital: A theoretical and empirical analysis, with special reference to education (Columbia University Press, New York, 1964).
- Use data from the Current Population Surveys (CPS) for Californian males for 1979 and 1995. This is cross -section data.
- Plots and conditional means for earnings (Y): $\frac{\sum_{i=1}^n Y_i}{n} | X = \text{years of education}$.
- Issues to think about: definition of the variables; changes in the nature of the survey; other factors that may be relevant (could be macroeconomic - economy wide, or microeconomic - concerning the individual).

- Other types of data: time-series data; longitudinal data.
- Are we learning an art or a science? A brief glance at methodology.
- What today's lecture was about:
 1. an overview of what is to come in the course until we finish in May.
 2. an introduction to economic data and the idea of empirical relationships between two measured variables. The example we use will be years of education and gross weekly earnings for male Californians for 1979 and 1995.
 3. the example shows the problems inherent in using economic data to test an empirical relationship. The data in this instance has the problems of: other variables, sample survey, top-coding on the earnings data.
 4. conditional mean function
 5. other forms of data: time-series and its relation to cross-section data.