Social Science Models

- The on line reading by Paul Krugman is eloquent on this topic

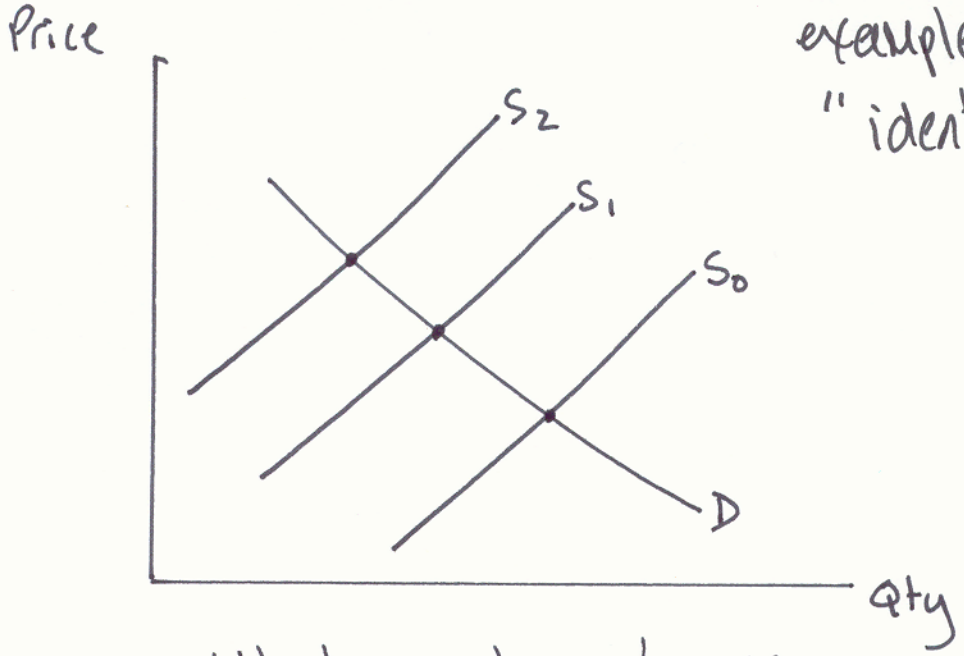
- Basic point:
  - physics is easy, and many theories (e.g. quantum electrodynamics) represent exact explanations of physical phenomena
  - social science is difficult
    - our models are highly simplified abstractions of the world, so we can make sense of it.
    - a good model includes what is important and excludes what is not; but opinions differ on what is important.
    - we do not expect the data to match the model exactly: different models may approximate data equally.

The Identification Problem

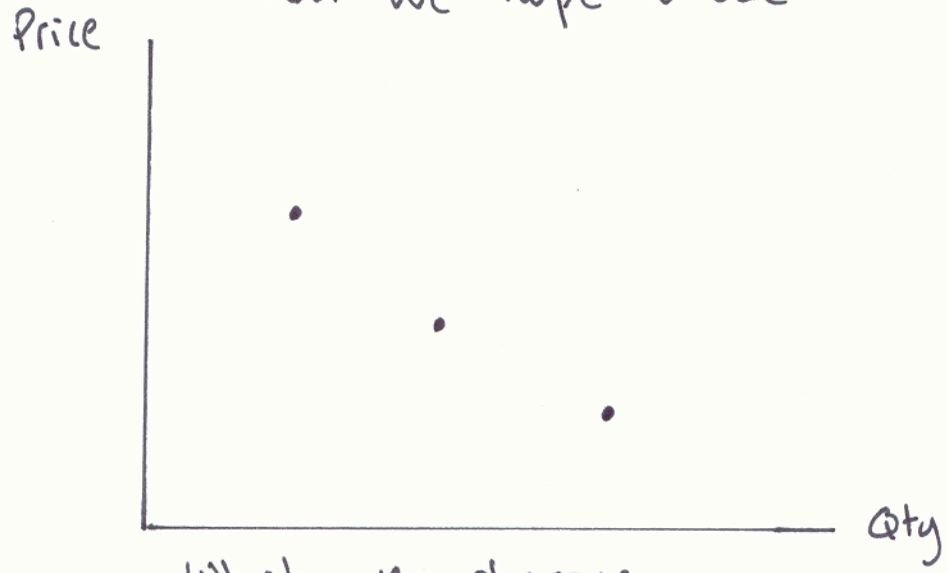
- Clinical trials
  - Main feature is that drug & placebo are allocated at random.
- Agricultural trials
  - different seed varieties are allocated to plots in a field at random.
- Economists:
  - can almost never randomize treatments.
  - so detecting the effects of treatments requires that we ensure that:
    - we are aware of what else is going on,
    - and that we can adequately adjust our empirical analysis to correct for these other things

very difficult to do in practice. →

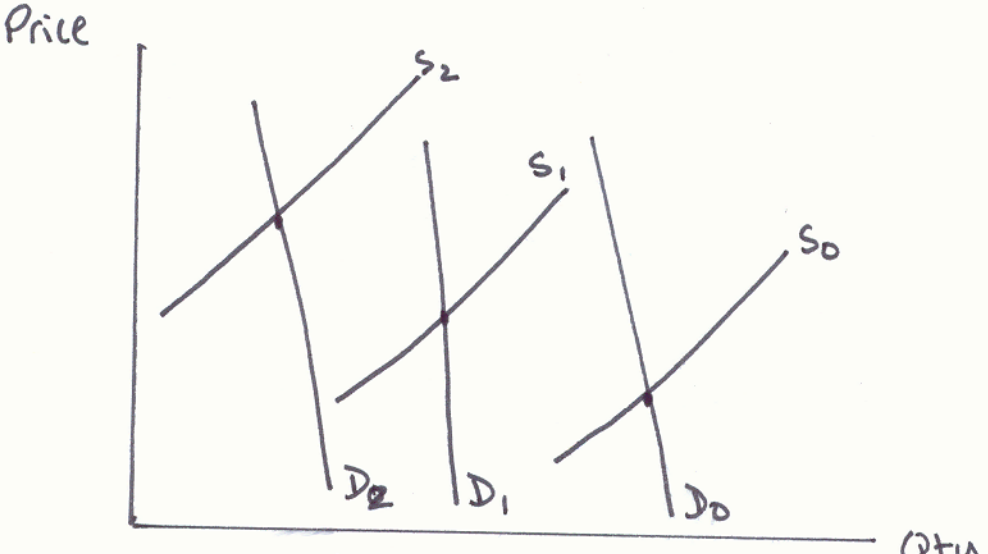
The most common example of the "identification problem."



What we hope to see



What we observe



And what may be happening.

The Selection Problem

- Another common example of the identification problem is the "selection problem", applied to the value of education.

  - what is the value of an extra year of school?

    - problem, kids who stay in school an extra year are 'higher ability', so we can't separate the effect of ability from the extra year of school.

  - what is the value of a degree from CMU as opposed to, say, Pitt.

    - same problem. students self-select on the basis of ability.

- This would not be a problem if we could adequately measure ability, but we cannot
- Also not a problem if we could allocate students at random, but no government will allow us.

Natural Experiments

- Economists try to get around their failure to conduct designed experiments by searching for natural experiments.

Example:

- Effect of an extra year of schooling: need to find some variation across kids that is not related to ability.
  - In U.S. schooling mandatory to 18
  - A child must begin school if he/she turns 6 before September 1.
  - Among 16 yr. old school leavers,
    born before 1 Sept: 10 yrs of school
    born after 1 Sept: 9 yrs. of school

And date of birth is not related to ability (we assume).

Example:

- Value of going to a better university.
- Stacy Dale & Alan Krueger* in 1999 devised a 'natural' experiment.
- From pairs of students who were accepted to exactly the same set of schools, but ended up going to different schools:

	School 1	School 2	School 3	School 4
Student A	Accepted	Rejected	Accepted	Accepted*
Student B	Accepted*	Rejected	Accepted	Accepted

* denotes school student went to.

- Then look at differences in post graduate wages.
- Now, all previous studies had found that school quality mattered.
- This study found no differences in the wage performance of the two students.

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* Dale, S. & A. Krueger (1999): "Estimating the payoff to Attending a More Selective College." NBER W.P. no. 7322, August.

Let me expand a little:

- They looked at the high school class of 1972, and followed their earnings 20 years later.
- Had thousands of pairs to study.
- As measured by college average SAT score, there was no difference in earnings.
- But, there <u>was</u> a difference by tuition. Student who went where the tuition was higher subsequently earned more.

So you guys are alright...

or are you?

- Problem with macroeconomics is that it is aggregated. There are so many other things going on outside our heuristic models that it is hard (impossible?) to find natural experiments that control for all the unwanted identification problems.

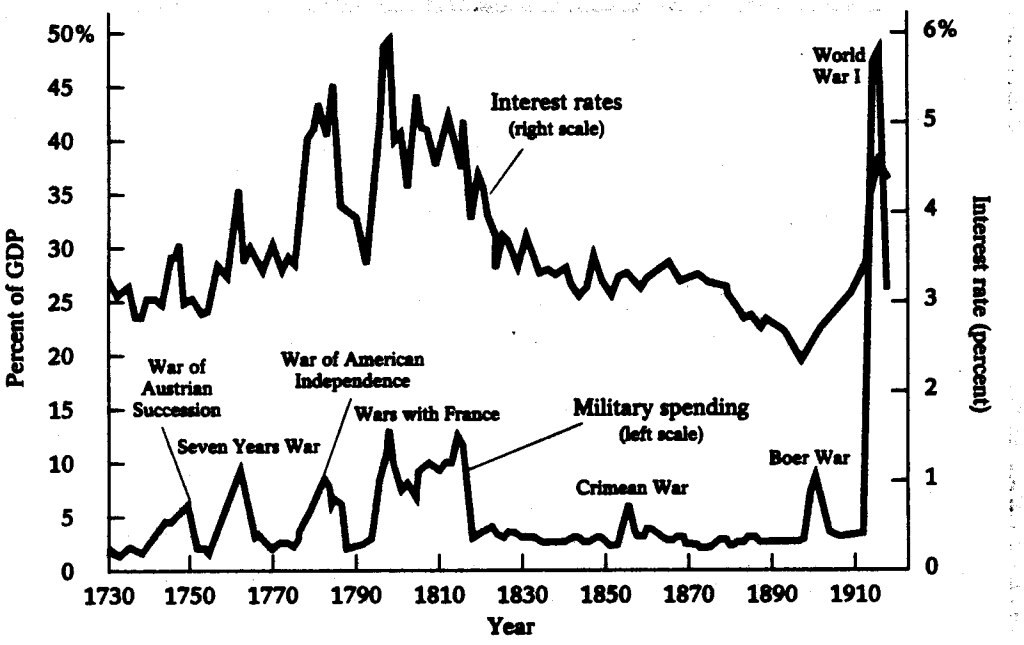
Example

In some theories we will study later:

- One theory says that when government spending goes up, interest rates rise.
- Another theory says that government spending has no effect on interest rates.

Problem: interest rates are low in recessions; recessions may induce government to spend; recovery from recession causes interest rates to rise.

Attempt to find a 'natural experiment': govt. expenditure goes up during <u>war</u>, independently of state of economy.



- So is this proof?

Criticism:

- wars are more likely when the economy is bad (e.g. Argentina in the Falklands) so it is not a natural experiment.
- govt. will default on loans if it loses war, so the higher interest rates reflect an increase in <u>risk</u>.

What I expect from you.

- Assignments : 6 - 8 of them.
  frontloaded.
  may work in pairs.
  due dates.
- Exams : 2 mid-terms
  - Feb 22
  - March 29

  Final exam
  - date ?
- Readings : online readings part of exams.
  I do not follow text closely
- Attendance: will save you time & effort.