Do I have an endogeneity problem? And does it matter?

Dealing with Endogeneity

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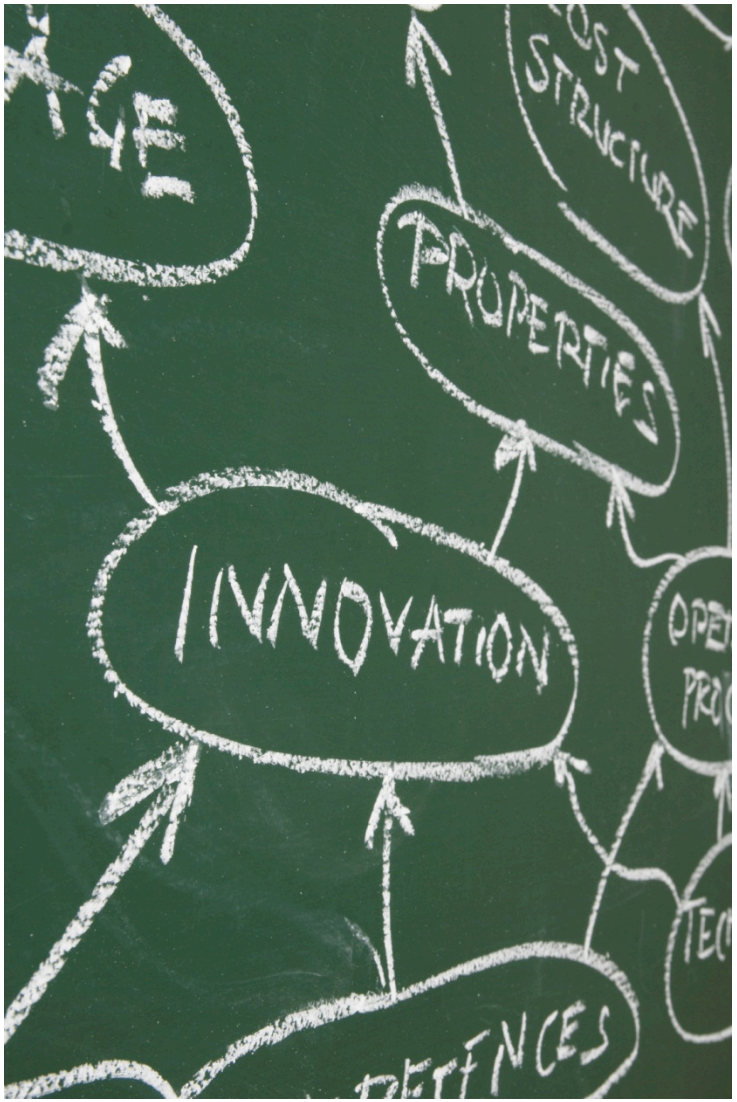
My Research

- determinants of innovative activity;
- the management of innovation;
- the functioning of markets for technology.

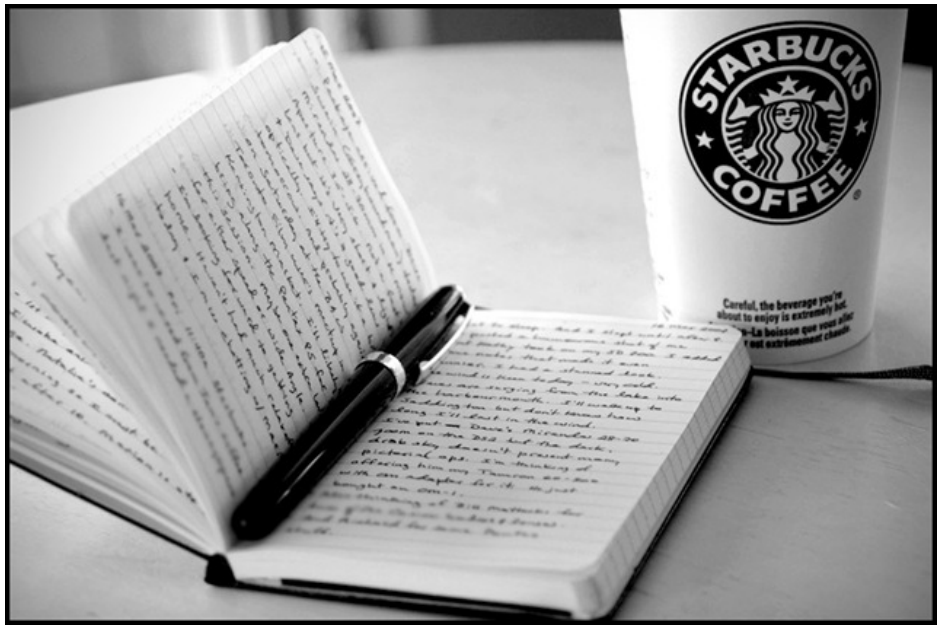
I use patent litigation data as window on the market for technologies



My Perspective as Author/Referee

Instrumental Variables

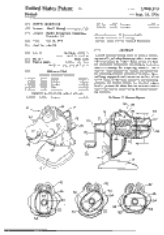
The Role of Theory

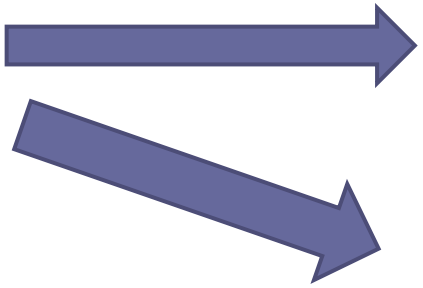


How does the market for innovation affect patent litigation?

The **market for innovation** –the licensing and sale of patents- is an important source of R&D incentives, especially for small firms and innovative entrepreneurs (Arora, Fosfuri and Gambardella, 2001; Gans, Hsu and Stern, 2002)

Growing concern in academic and policy debates that patent transactions can deter innovation if they take place for the purpose of extracting rents through **patent litigation**, and not associated with technology transfer (U.S. FTC 2011 report and U.S. Supreme Court)

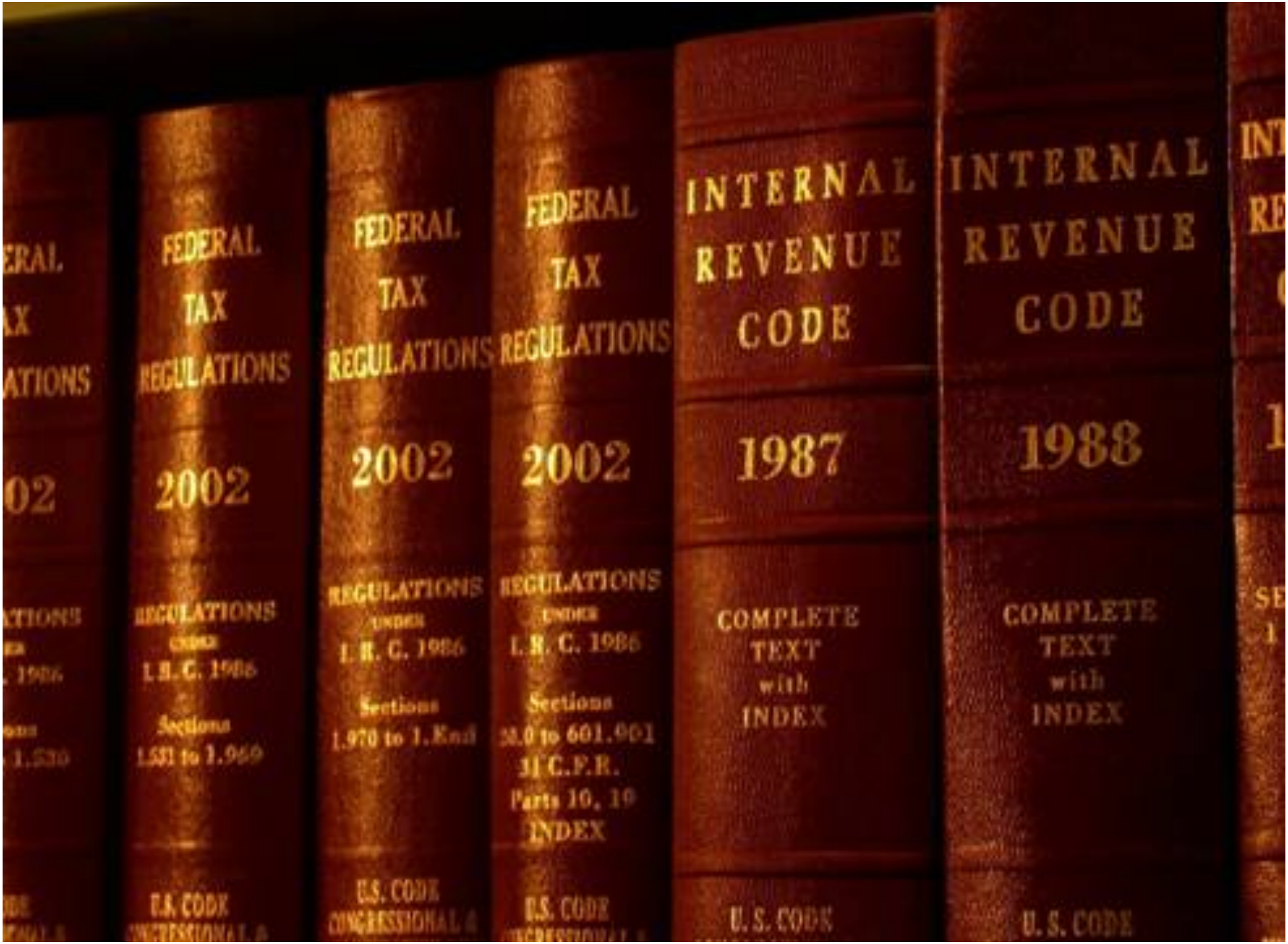




Can we conclude that the market reallocates patent to entity with higher propensity to litigate?

OR

Increase in technology value made patent more likely to be traded and litigated??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Galasso, Schankerman and Serrano (2012) "Trading and Enforcing Patent Rights"

Identification Strategy

According to section 1235 of the Internal Revenue Code, the **transfer of a patent** by an individual is treated as the sale of a capital asset and is subject to **capital gain taxes**. On the other hand, **patent litigation damages** (and licensing royalties) are **taxed as ordinary income**.

This means that the decision to trade a patent will be affected by the capital gains tax rate, but the decision to litigate will not!

Findings

- First, capital gains taxes strongly affect market transactions in patent rights granted to individual inventors.
- Second, the reallocation of these patent rights reduces litigation risk for individually-owned patents, on average, indicating that enforcement gains are more important than product market gains for such patents.
- Third, the marginal treatment effect of trade on litigation is heterogeneous. Patents with larger potential gains from trading are those with the highest estimated probability of changing ownership, suggesting that the market reallocates patent rights efficiently.

Do IP rights on existing technologies hinder subsequent innovation?

Cacophony of theories (Kitch, Green and Scotchmer, Heller and Eiseberg)

Some empirical evidence (Williams, 2012; Murray and Stern, 2007) but in most technology areas the relationship between innovation and IP remains unexplored.

Endogeneity Problem

Can we conclude that IP reduces cumulative innovation?

OR

Positive shock in the value of the underlying technology?

Galasso and Schankerman (2012) work in progress.

IDENTIFICATION STRATEGY

Judges are assigned to patent cases through ***a computer program that randomly generates three-judge panels****, subject to the judges' availability and the requirement that each judge deals with a representative cross-section of the fields of law within the jurisdiction of the court (Fed. Cir. R. 47.2).*

We exploit the random allocation of patents to CAFC judges in validity cases and construct an index capturing the propensity of the three judge panel to vote in favour of patent invalidity as IV

(Very Preliminary) Findings

We find that patent invalidation is on average associated with roughly 50 % increase in citations received).

The marginal treatment effect of patent invalidation is highly heterogeneous:

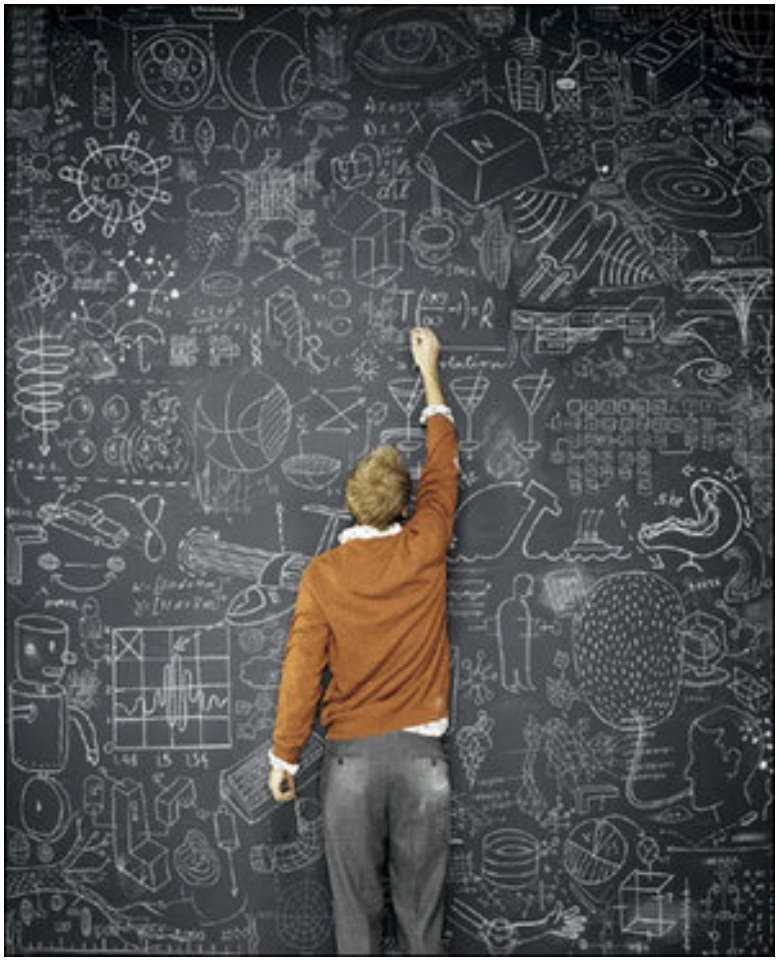
- Across tech areas (effect very large for medical instruments but not statistically significant from zero in electronics);
- Within tech areas (invalidating a patent of a large firm has greater impact than small firm especially if lots of small firms operate in tech area).

Some lessons I've learned

1. Good IVs hide behind institutional details;

2. Good instrumental variables have to be complemented with good theory;

3. Bad instrumental variables have to be substituted with good theory;



Bandiera, Guiso, Prat and Sadun (2012) ***"Matching firms, managers and incentives"***

How do firms and managers generate surplus by matching appropriately?

Exogenous variation very difficult to get….

Theory: *managers differ in talent and risk aversion, firms differ in their cost structure and private benefits from control.*

Their model offers detailed predictions on:

- contract offered by firms (high power incentives less likely when control benefits are high);
- type of contract accepted by managers (high talent choose high incentives);
- effort of managers, satisfaction and wages (higher with steep contract);
- profits of firms (higher with high power incentives).

Data strongly support their theory.

Alternative theories may be consistent with a subset of the correlations they report but not entire set.

IT JUST MAKES SENSE

Isn't this more convincing than bad IV? Or more instructive than good IV but unclear mechanism??

Thank you!