Doing Good with (Good) Econometrics

Gregory S. Crawford
Dept. of Economics
University of Warwick

Warwick Economics Summit
University of Warwick
February 19, 2011
Three Ideas Today

1. Econometrics is *incredibly useful*

2. Econometrics is *increasingly useful*

3. Econometrics can be used to *do good*
Three Ideas Today

1. Econometrics is *incredibly useful*

2. Econometrics is *increasingly useful*

3. Econometrics can be used to *do good*
Three Ideas Today

1. Econometrics is *incredibly useful*

2. Econometrics is *increasingly useful*

3. Econometrics can be used to *do good*
Three Ideas Today

1. (Good) Econometrics is *incredibly useful*

2. (Good) Econometrics is *increasingly useful*

3. (Good) Econometrics can be used to *do good*

(But only if it’s *good* econometrics)
“Are you just pissing and moaning, or can you verify what you’re saying with data?”

S: The New Yorker (?)
It all starts with **Data**
## New words for the lexicon

<table>
<thead>
<tr>
<th>Unit</th>
<th>Size</th>
<th>What it means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit (b)</td>
<td>1 or 0</td>
<td>Short for “binary digit”, after the binary code (1 or 0) computers use to store and process data</td>
</tr>
<tr>
<td>Byte (B)</td>
<td>8 bits</td>
<td>Enough information to create an English letter or number in computer code. It is the basic unit of computing</td>
</tr>
<tr>
<td>Kilobyte (KB)</td>
<td>1,000, or $2^{10}$ bytes</td>
<td>From “thousand” in Greek. One page of typed text is 2KB</td>
</tr>
<tr>
<td>Megabyte (MB)</td>
<td>1,000KB; $2^{20}$ bytes</td>
<td>From “large” in Greek. The complete works of Shakespeare total 5MB. A typical pop song is about 4MB</td>
</tr>
<tr>
<td>Gigabyte (GB)</td>
<td>1,000MB; $2^{30}$ bytes</td>
<td>From “giant” in Greek. A two-hour film can be compressed into 1-2GB</td>
</tr>
<tr>
<td>Terabyte (TB)</td>
<td>1,000GB; $2^{40}$ bytes</td>
<td>From “monster” in Greek. All the catalogued books in America’s Library of Congress total 15TB</td>
</tr>
<tr>
<td>Petabyte (PB)</td>
<td>1,000TB; $2^{50}$ bytes</td>
<td>All letters delivered by America’s postal service this year will amount to around 5PB. Google processes around 1PB every hour</td>
</tr>
<tr>
<td>Exabyte (EB)</td>
<td>1,000PB; $2^{60}$ bytes</td>
<td>Equivalent to 10 billion copies of <em>The Economist</em></td>
</tr>
<tr>
<td>Zettabyte (ZB)</td>
<td>1,000EB; $2^{70}$ bytes</td>
<td>The total amount of information in existence this year is forecast to be around 1.2ZB</td>
</tr>
<tr>
<td>Yottabyte (YB)</td>
<td>1,000ZB; $2^{80}$ bytes</td>
<td>Currently too big to imagine</td>
</tr>
</tbody>
</table>

*Source: The Economist*
More Data Demands More Analysis

- “Mankind created 150 exabytes of data in 2005. This year, it will create 1,200.”
- “Data are becoming the new raw material of business: an economic input almost on par with capital and labor”
Who’s Going to Do It?

“A new kind of professional has emerged, the data scientist [econometrician], who combines the skills of

- A software programmer,
- Statistician, and
- Storyteller/artist Interpreter

to extract the nuggets of gold hidden under mountains of data.”

Hal Varian, Google Chief Economist:

“Data ... are widely available; what is scarce is the ability to extract wisdom from them.”
Econometrics is Useful

Why Econometricians???

- Econometrics combines

  Economics

  +

  Statistics
Why Is This Combination Useful???

1. Economics ≡
   - People respond to incentives
   - (This insight can be embodied in “behavioral relationships”)

These relationships show up in Data

2. Statistics...
   - Allows them to be recovered from the data

(But ONLY if it is done well)
(i.e. only if it is good econometrics)
What is Good Econometrics?

Good Econometrics encompasses three elements:

1. An understanding of the economic forces generating the data,

2. The specification of an econometric model and estimation approach that can accurately and flexibly measure those forces, and

3. A careful interpretation of the results
What is Bad Econometrics?

- Bad econometrics is econometrics that is *not good*

- For example, bad econometrics might demonstrate ...
  - A lack of thought or understanding about...
  - Any (or all) of the three pillars of good econometrics

**Bottom Line:**

Econometrics is a *complement to*, not a *substitute for*, *thinking!*
Is Bad Econometrics really so Bad?

- Bad econometrics is far worse than no econometrics

- If we can’t measure something, we necessarily make judgements based on whatever qualitative evidence is available
  - (We’ve made decisions this way for thousands of years)

- Bad econometrics allows a new kind of mistake: false confidence
  - Bad econometrics will give “a number” based on methods that may appear plausible
Two Examples

1. Can a vertical merger drive out independent news?

2. Should TV channels be sold à la carte?
Bloomberg Television vs Comcast/NBC

vs

Bloomberg

vs

comcast

NBC
(Michael Bloomberg)
How can we tell if Comcast/NBC would behave anti-competitively?
Vertical Integration, Favoritism, and Competition

Austan Goolsbee asked a good question:

- Do cable systems carry more frequently their integrated channels?
  - Do they do it less when facing competition?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Goolsbee¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Integration</td>
<td>3.553***</td>
</tr>
<tr>
<td>Vertical Integration × Competition</td>
<td>-0.194***</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Other Controls</td>
<td>...</td>
</tr>
<tr>
<td>Not Reported</td>
<td>...</td>
</tr>
</tbody>
</table>

Goolsbee (2007) says Yes to both questions

¹ Goolsbee (2007), Table 12G (The Science Channel). Finds similar effects for 9 of 11 channels.
Vertical Integration, Favoritism, and Competition

- Do cable systems carry more frequently their integrated channels?
  - Do they do it less when facing competition?
  - What did Comcast find?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Goolsbee(^2)</th>
<th>Comcast(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Integration</td>
<td>3.553***</td>
<td>-3.157***</td>
</tr>
<tr>
<td>Vertical Integration (\times) Competition</td>
<td>-0.194***</td>
<td>0.112***</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Other Controls</td>
<td>Not Reported</td>
<td></td>
</tr>
</tbody>
</table>

Do Comcast's results make sense???

---

\(^2\) Goolsbee (2007), Table 12G
\(^3\) Israel and Katz (2010a), Table VI.1
**Vertical Integration, Favoritism, and Competition**

What do you think was going on???

- (It turns out one of Comcast’s econometricians made a mistake)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Goolsbee(^6)</th>
<th>Comcast(^4) (w/ mistake)</th>
<th>Comcast(^5) (corrected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Integration</td>
<td>3.553(^***)</td>
<td>-3.157(^***)</td>
<td>1.463(^***)</td>
</tr>
<tr>
<td>Vertical Integration × Competition</td>
<td>-0.194(^***)</td>
<td>0.112(^***)</td>
<td>-0.019(^**)</td>
</tr>
<tr>
<td>Other Controls</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Not Reported</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After the correction, Comcast’s results agree with Goolsbee:

- More competition leads to less favoritism
- (Suggesting anti-competitive incentives at work)

\(^4\) Israel and Katz (2010a), Table VI.1
\(^5\) Israel and Katz (2010b), p.2
\(^6\) Goolsbee (2007), Table 12G
What Happened?

“Broadly, the [FCC] said that Comcast must not favor its own content over competitors content on its cable systems.”

“Specifically, the commission said that ‘if Comcast neighborhoods its news (including business news) channels, it must include all unaffiliated news (or business news) channels in that neighborhood.’

Bloomberg Television vs Comcast/NBC

Questions or Comments?
Should TV Channels be sold À La Carte???

How many channels do you get in your cable/satellite bundle?

How many do you watch???
PICK AND PAY FOR THE CHANNELS YOU WANT. THAT'S HOW CABLE SHOULD BE.

Below is a typical Expanded Basic cable package*. Uncheck the networks you don't want and we'll calculate your new bill. Sadly, this is just a demonstration of "how cable should be" and won't reduce your real cable bill. We'll use your vote – the choices you voice here – to help educate the public and tell cable companies, programmers, and our public servants that bringing consumer choice to cable is a must!

UNCHECK WHAT YOU DON'T WANT.

- ✔️ ESPN $3.80/mo.
- ✔️ TNT $1.00/mo.
- ✔️ CNN $1.00/mo.
- ✔️ CNBC $0.90/mo.
- ✔️ USA $0.85/mo.
- ✔️ AMC $0.75/mo.
- ✔️ FX $0.75/mo.
- ✔️ MSNBC $0.70/mo.
- ✔️ Discovery $0.70/mo.
- ✔️ Cartoon Network $0.70/mo.
- ✔️ Regional Sports Network $2.25/mo.
- ✔️ Sci-Fi Channel $1.00/mo.
- ✔️ MTV $0.80/mo.
- ✔️ Animal Planet $0.65/mo.
- ✔️ ESPN2 $1.05/mo.
- ✔️ Disney $0.95/mo.
- ✔️ Bravo $0.85/mo.
- ✔️ Fox News Channel $0.75/mo.
- ✔️ ABC Family $0.75/mo.
- ✔️ TV Land $0.70/mo.
- ✔️ NFL $0.70/mo.
À La Carte

- Some support for à la carte in U.S. policy circles:
  - Former FCC Chairman Kevin Martin (August 22, 2007):
    - “I believe all consumers would benefit from channels being sold in [an] à la carte manner.”
  - Senator John McCain (March 26, 2004):
    - “When I go to the grocery store to buy a quart of milk, I don’t have to buy a package of celery and a bunch of broccoli... I don’t like broccoli.”
The Welfare Effects of Bundling in Multichannel Television Markets *

Gregory S. Crawford†  Ali Yurukoglu‡

November 2010

Abstract

We measure how the bundling of television channels affects social welfare. We estimate an industry model of viewership, demand, pricing, bundling, and input market bargaining using data on ratings, purchases, prices, bundle composition, and aggregate input costs. We conduct counterfactual simulations of à la carte policies that require distributors to offer individual channels for sale to consumers. We estimate
À La Carte: Crawford & Yurukoglu (2010)

What do we do?

- Estimate demand for individual television channels (CNN, MTV, etc.)
- Estimate marginal costs for those channels
- Model the *bargaining* between channels and distributors
  - Why? If CNN gets $0.50/month for 100m US households...
  - How much will they want if only 40m sign up?
- Simulate a world where firms sell channels à la carte
À La Carte: Crawford & Yurukoglu (2010)

What do we find?

- If channels cost the same to cable systems...
  - Consumers *would* be (17%) better off
- But channels *wouldn’t* cost the same:
  - Channels and distributors would re-negotiate contracts
- After renegotiation, we estimate consumers are *no better off*
  - (And would likely be worse off) Why?
    - Channels would be 145% more expensive to downstream firms without bundles.

**Bottom Line:** The policy would likely be a bad idea

- (At least in the short-run)
À La Carte

Questions or Comments?
I hope these examples have shown that
  ▶ Good econometrics is critical for good decisions/policies

I also think that
  ▶ Good econometrics can be a powerful agent for good in the world
Why?

▶ More data $\Rightarrow$ more evidence-based policymaking, but...
▶ The playing field isn’t level.
▶ Which parties have an advantage?
  ★ (Rich ones, Organized ones)
▶ Which ones don’t?

As a society, we will need good econometricians advocating for good causes
▶ (Consumer interests, Disadvantages citizens)
▶ (NGOs and Charities)
If you

1. Are passionate about a particular social problem, and
2. Have an interest in econometrics

I encourage you to pursue that interest and those skills

- I can promise you they will need you
- (Even if they don’t know it yet)
Questions or Comments?

Thank you very much!