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Comments on "From Patent Thickets to Patent Networks"

May 2015

A puzzle

- Technological progress is proceeding rapidly;
- But so is patenting and the logic of the “patent thicket” makes some sense;
- Patent pools may square the circle.

Technological change

1990: Primitive email, basic spreadsheets and statistical packages;

1995: Email, spreadsheets, statistical packages — same functionality, easier use, plus you can carry your computer with you and play music on it;

2000: Ditto, but with wireless connectivity and far more useful search functions—the computer now also plays video;

2005: Ditto, but with wireless ubiquity; hardware and software limitations are no longer a factor for most work-related use;

2015: Ditto, but in your pocket, plus voice commands and videophones.

Has technological change sped up or slowed down? The evidence from everyday can be interpreted in multiple ways.

The case for a slowdown:

Peter Thiel, Tyler Cowen, and Robert Gordon

FIGURE 1. ANNUAL GROWTH RATE OF TOTAL FACTOR PRODUCTIVITY FOR TEN YEARS PRECEDING YEARS SHOWN, YEARS ENDING IN 1900 TO 2012.

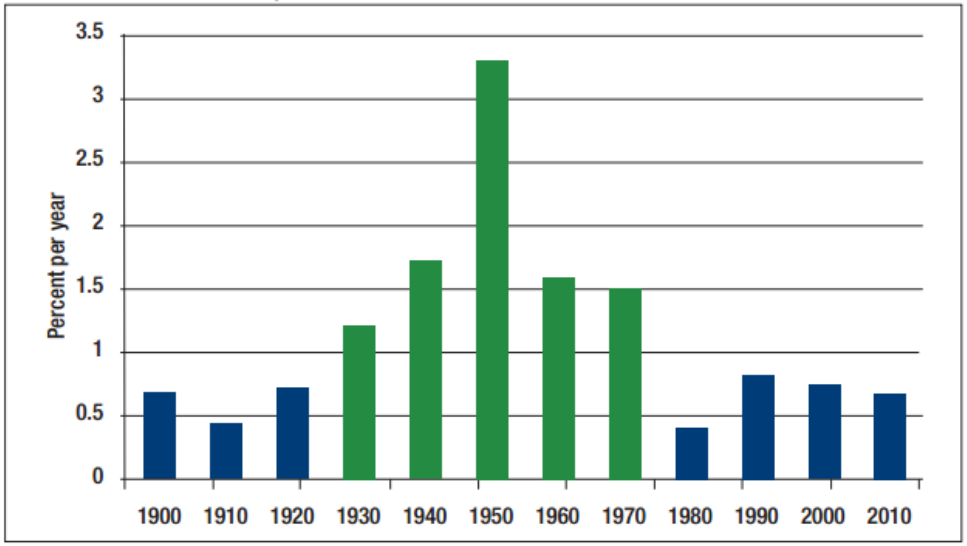
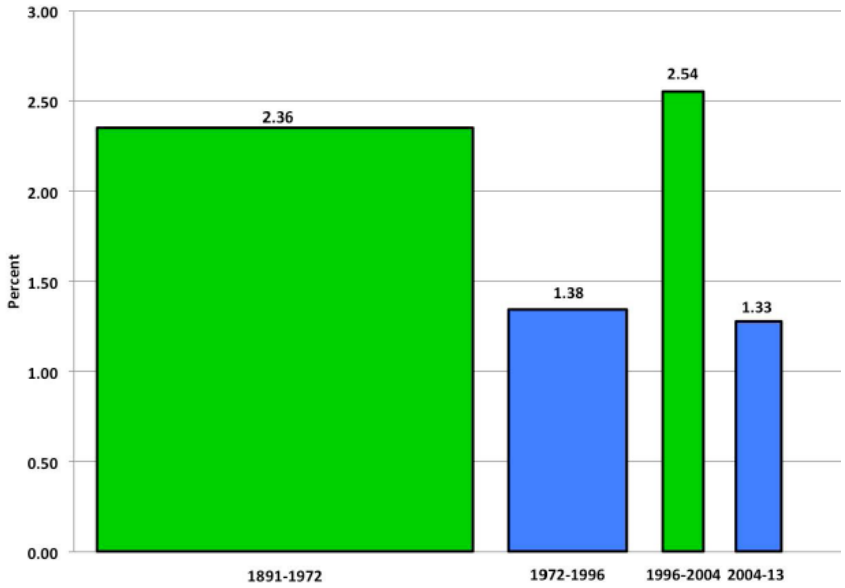


Figure 5. Annualized Growth Rates of Output per Hour, 1891-2013



Source: Robert Gordon, "US Economic Growth is Over: The Short Run Meets the Long Run," *Growth, Convergence and Income Distribution: The Road from the Brisbane G-20 Summit* http://www.brookings.edu/~/media/Research/Files/Interactives/2014/thinktank20/chapters/tt20-united-states-economic-growth-gordon.pdf?la=en and "The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections," Working Paper 19895 http://www.nber.org/papers/w19895

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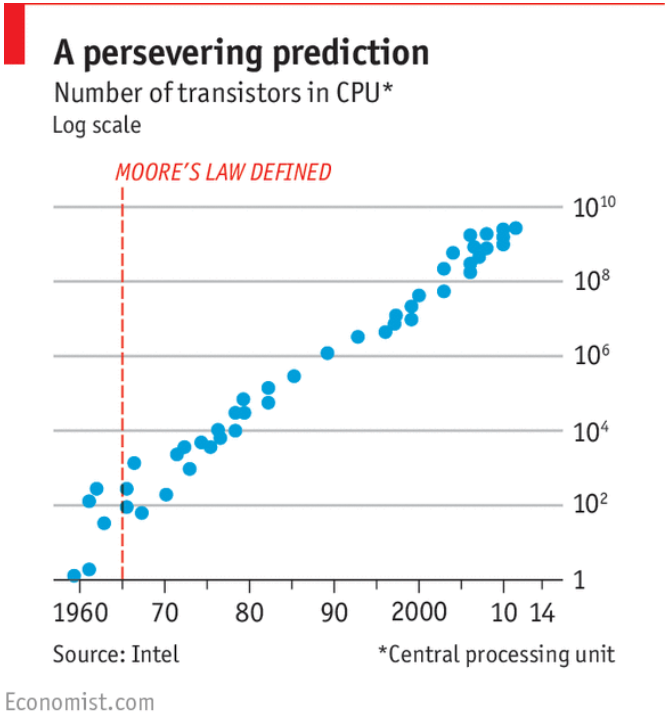
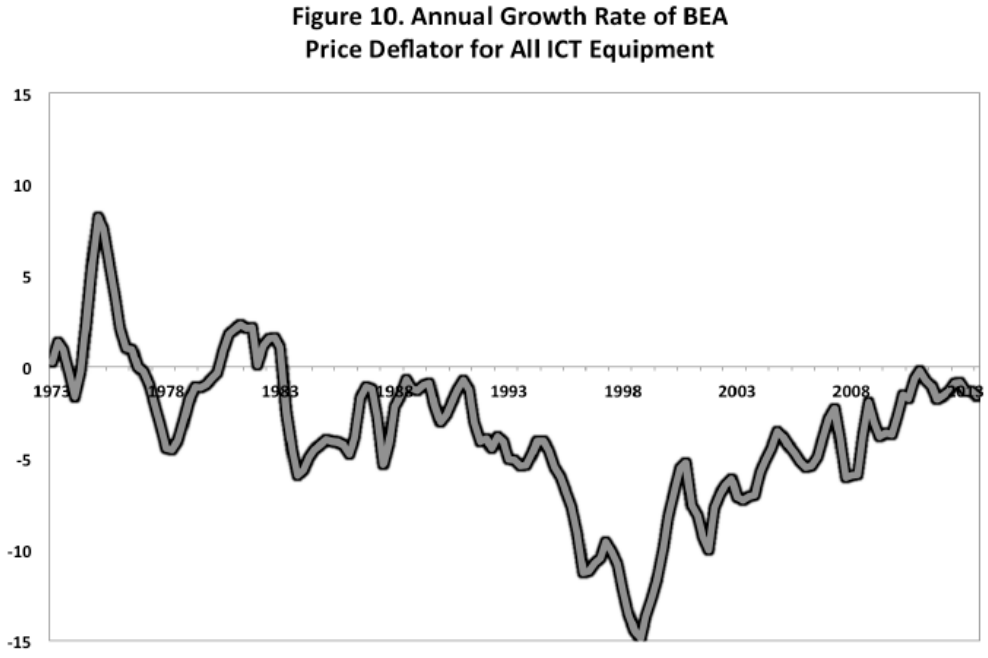
Moore's Law, paradoxically, may strengthen the case



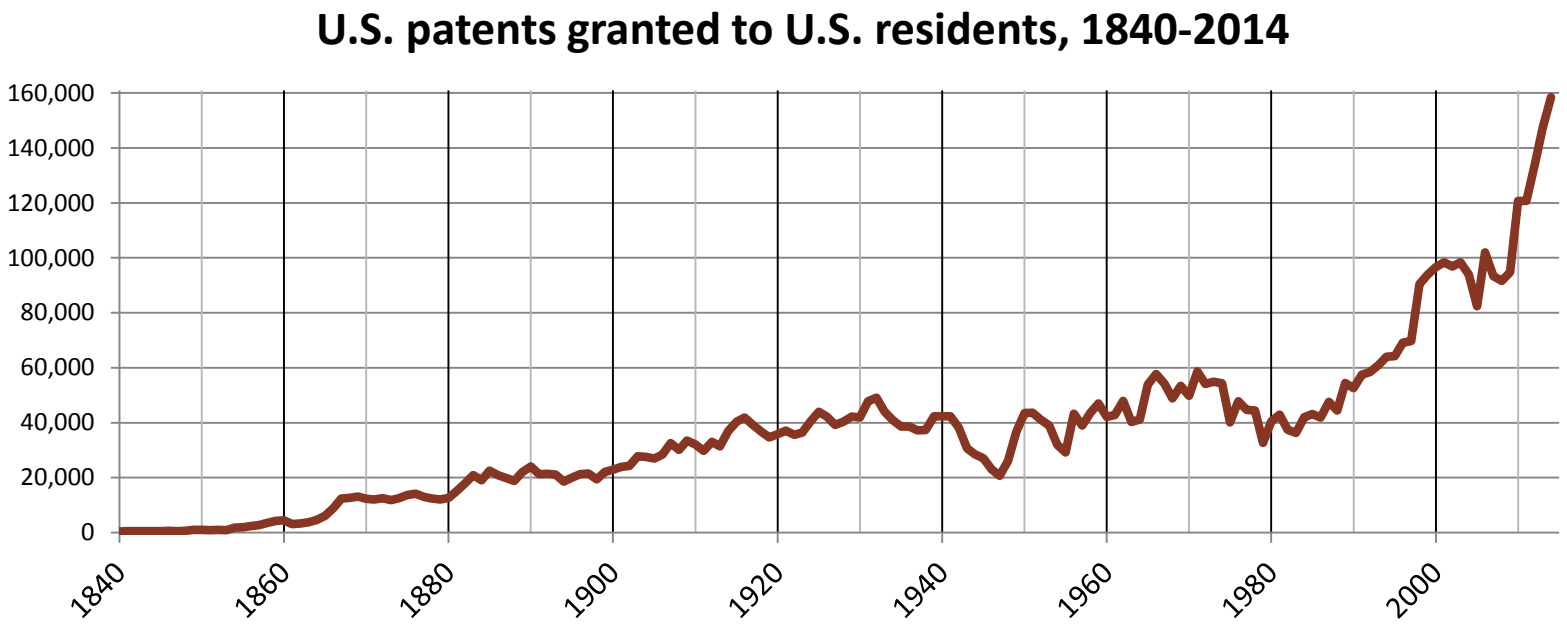


Source: "The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections," Robert Gordon Working Paper 19895 http://www.nber.org/papers/w19895

R&D spending in ICT rises monotonically in 1998-2013

- But R&D spending remains constant as a % of revenues;
- If R&D is subject to Baumol's Law, then this result would be consistent with the hypothesis that innovation is slowing;

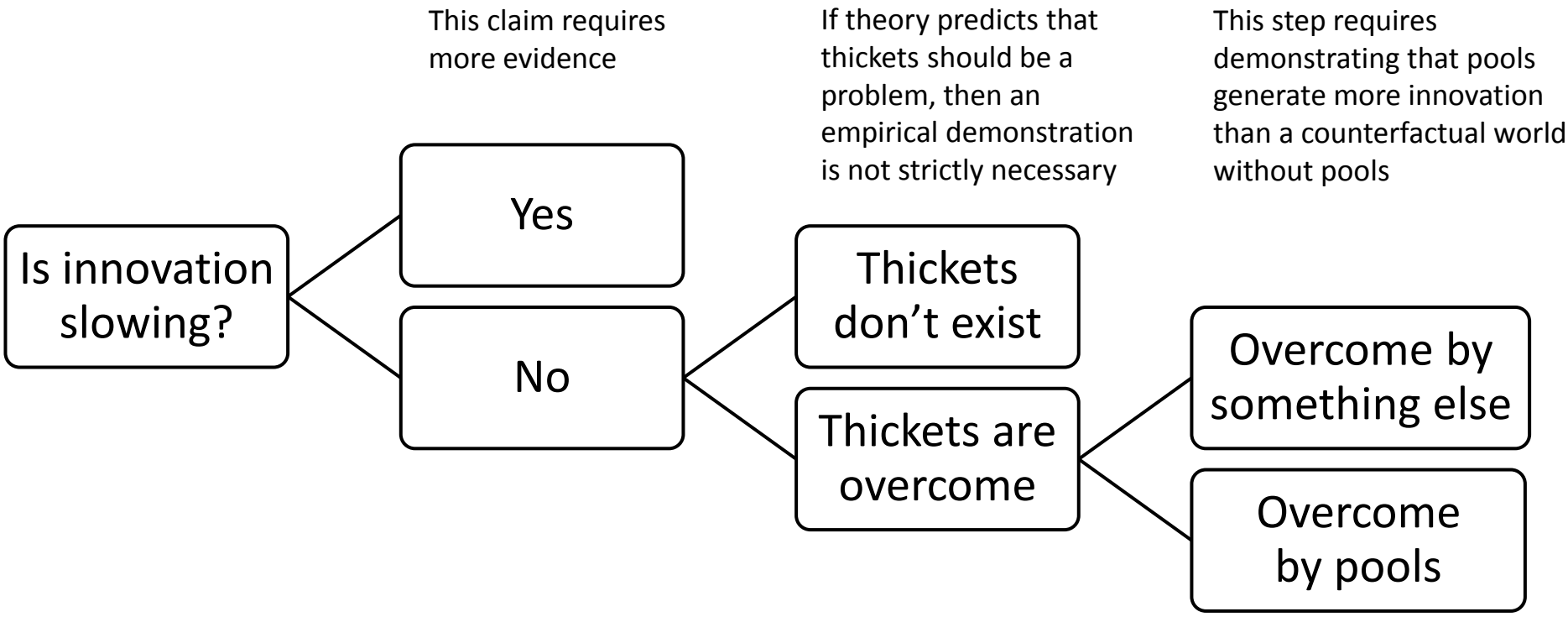
How can the proponents of this story reconcile the above with the below?



Source: United States Patent and Trademark Office
http://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm

Answer: Patent thickets

"A dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology."
Litigation up since the creation of the federal circuit in 1982



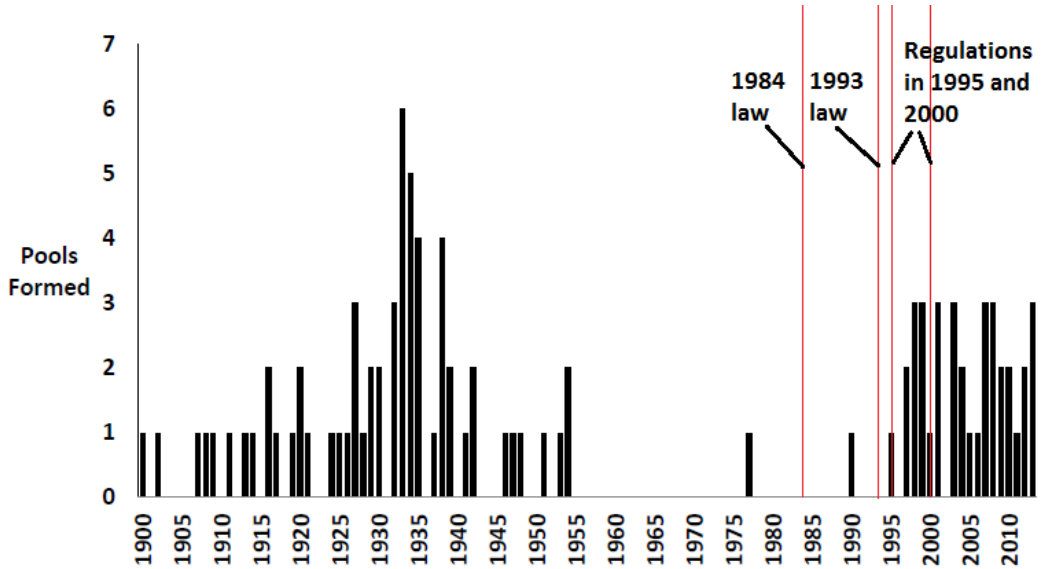
Theory: Cutting through the thickets

- Thickets are a variant on the hold-up problem;
- Network technologies are particularly subject to hold-up;
- Solutions:
  1. State monopolist → "regulation" seems like the more intuitive term;
  2. Market monopolist → one firm controls everything;
  3. Market association

Patent pools as a market association

"A consortium of at least two companies agreeing to cross-license patents relating to a particular technology

1. Pools reduce regulatory risk by making it easier to license patents and reducing perceived hold-up;
2. Pools reduce hold-up risk especially if they are actively administered by third parties;
3. Pools can enjoy scale economies in the licensing of technology.



Reasons (2) and (3) applied to the pre-WW2 pools as well, but those pools were *not* actively administered.

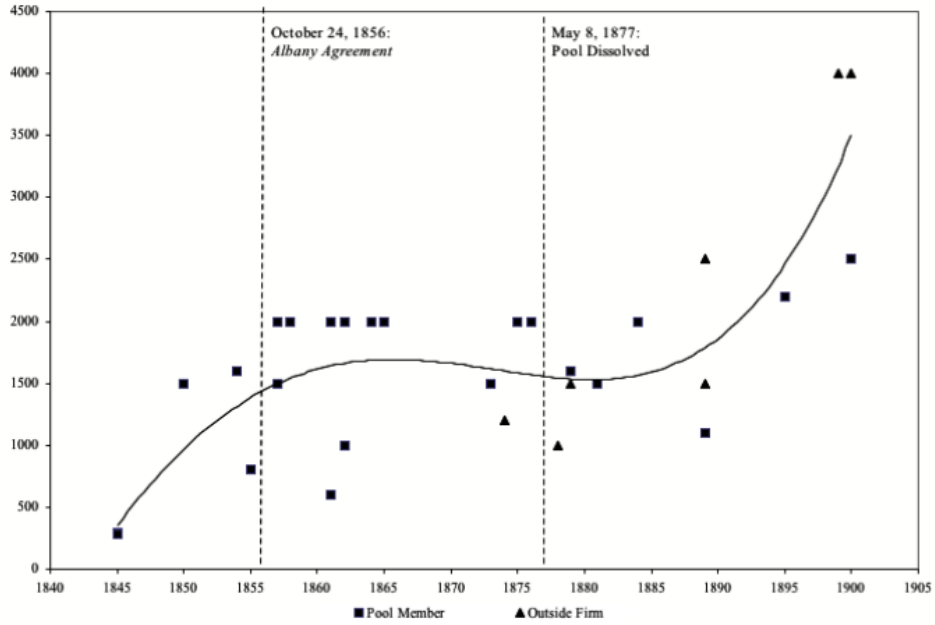
Might all the action be on reason (1)?

Are pools benevolent? History

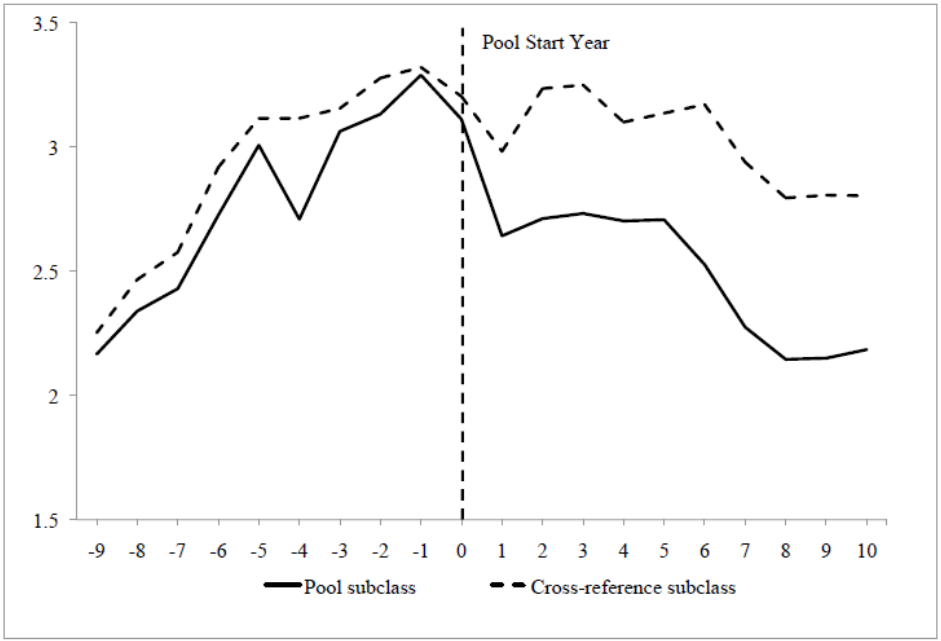
Ryan Lampe and Petra Moser

1. The Sewing Machine Combination (1856-1877) discouraged patenting and innovation, in particular for the members of the pool. Data on stitches per minute, as an objectively quantifiable measure of innovation, confirm these findings. Innovation for both members and outside firms slowed as soon as the pool had been established and resumed only after it had dissolved;
2. Pools were temporarily tolerated under the New Deal. Difference-in-differences regressions of patents and patent citations across 20 industries imply a 14 percent decline in patenting for each additional patent that is included in a pool.

FIGURE 5 - STITCHES PER MINUTE



POOL VERSUS CROSS-REFERENCE SUBCLASSES



Are pools benevolent?
Theory

Pools have two strategies:

1. Charge high prices on low volume;
2. Charge low prices on high volume, e.g. “commoditization.”

The first theoretical problem is that it is hard to see which strategy is being pursued. How much would be sold in the absence of royalties?

The second theoretical problem is that even if (2) is the dominant strategy, if does not rule out the possibility that rents are being earned above and beyond those needed to induce innovation.

The third is that the pool may be replacing multiple bandits with a single bandit. There are circumstances where that will be better and circumstances where that will be worse.

- If the technologies are complements, then it is better for consumers;
- If the technologies are substitutes, then it is worse for consumers.

But—theory also predicts that individual licensing and grant-backs should eliminate the ability to use pools to extract rents. And that is what the paper observes in modern pools!

Are pools benevolent?
Empirics

1. MPEG-2 pool may have reduced royalties from $4 to $2, but that does not necessarily mean a lack of pricing power;

2. I am not sure how to interpret the low MPEG LA royalties on Dell computers. It certainly seems low, but it that because of the structure of the pool or because the technology is used in a low-margin very-competitive downstream sector? In fact, the story on p. 45 about competition from Google implies that the technology is substitutable. More data-points would be more convinced.

3. The firms which join pools are “upstream providers of technological inputs that hold high-value patent positions, exhibit high R&D intensities, lack robust downstream production capacities, and derive revenues from licensing.” Aren’t these precisely the firms that would benefit from holding up the downstream firms?

Conclusion:

Excellent paper!

Most likely correct, but not quite proven;

1. More data from more pools;
   - The use of comparative royalty data seems like an excellent idea
2. A more explicit counterfactual would help;
   - In particular, is there an exogenous measure of technological improvement?
   - If the counterfactual is the world before the pool, then such a measure would help;
3. Nailing down the motivating assumption!

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