The Co-existence of Patent Pools

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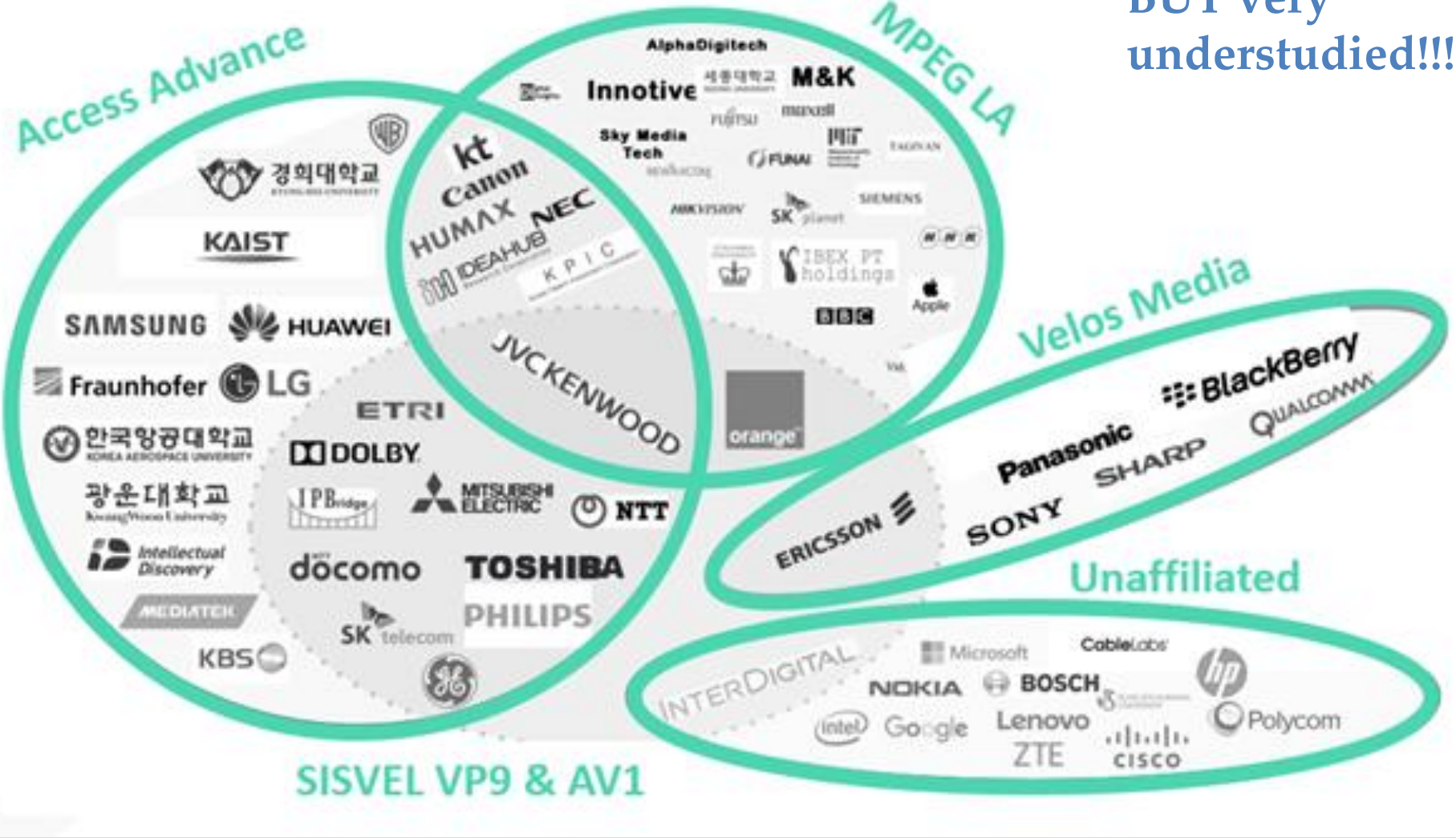
Main message and contribution

- Research question:
  What are the main determinants of co-existing patent pools?
- Approach: theoretical modeling
  - Vertically segmented mkt w/ homogeneous/heterogeneous downstream firms
- Results: coexist & competing pools allows market segmentation
  - co-existing pools in equilibrium always dominate a common pool
- Contribution: the first analysis on co-existing patent pools!
- Suggestions: ideas on motivation/interpretation and model extensions

Co-existing patent pools are common & very important!

BUT very understudied!!!



Source: https://www.iam-media.com/article/who-leading-the-vvc-technology-race

Some big picture antitrust questions

- Patent pools as joint marketing agreements: a key theme is to design "info-free" requirements to guarantee that pools improve welfare
  - Restoring competition (static environment)
  - Addressing tacit collusion (repeated games)
- Standardization: price regulation (standard essential patents)
- Antitrust IP guidelines: European Commission (2004), Japanese Fair Trade Commission (2005), and US DOJ (2007). DOJ example:
  - *Info light*: allows independent licensing; grantback provisions; …
  - *Info intensive*: pool includes only "essential" patents (w/o substitutes); …
- Understanding all existing Qs with co-existing patent pools is hard!
  - Nuances: relationship btw pools and the coverage of patents within a pool

1. Tie closer with antitrust issues in patent pools

- Q1: the paper excludes the case of perfect substitutes and abstract away from the relationships of patents in the pool (and across pools)
  - V'>0, V''<0 has a good capture of "more is better" (not perfect substitute), and diminishing return to patents; yet may not capture which patents are more valuable (standard essential), which are useful for high-tech pools
  - Depends on downstream technologies needs, the relationships of pool can also vary
  - **Ideas**: 1) can potentially replace V to V-e to use e as an essentiality parameter, where e~[0,V], where e closer to V means more complementary patents; 2) may want to consider $V(N_1+N_2-n)$ to use n to proxy for complementarity btw pools (n ~ [0, min{N_1,N_2}]), the idea may extent to common ownership.

- Q2: the model predicts all standalone firms would have incentives to join a pool, & abstract away from independent licensing by firms in the pool
  - Independent licensing is often considered collusion shield in repeated interactions (Rey-Tirole, 2019), among others (e.g., price cap)
  - **Ideas**: 1) would be helpful to add a discussion on indept licensing ; 2) maybe another paper on theoretical determinants of firm's participation decisions

2. Potential empirical tests in tech patent pools

- It would be great to enrich theoretical predictions with observations
  - Policy discussions usually center around individual pool designs, and do we miss anything important when ignoring the welfare benefits from co-existing pools?
  - **Ideas**: can interpret theoretical predictions with empirical observations in early co-existing pools, e.g., MPEG-2, DVD 3C & 6C pools (link: https://www.justice.gov/atr/chapter-3-antitrust-analysis-portfolio-cross-licensing-agreements-and-patent-pools)

- Test the prediction using empirical data? (esp. if can expand to N pools)
  - **Ideas**: Data on Technology Standards, Industry Consortia, and Innovation has data on many pools launched for different technologies (link: https://www.law.northwestern.edu/research-faculty/clbe/innovationeconomics/data/technologystandards/)

- Ideas on empirical measures of complementarity across patents
  - Ex ante: listed as standard essential by SSOs, not continuation patents
  - Ex post: litigation (PACER/Docket Navigator/USPTO litigation data -2016)

Final thoughts

- Very interesting topic, lots of fruit for thought
- Key takeaway: pools should be differentiated by size & downstream firms should have sufficiently dispersed technologies
- Main thoughts: tie the motivation closer with antitrust and tech pool current issues, with future extensions & empirical tests!
- Already very polished. Looking forward to the final version!