Artificial Intelligence and the Antitrust Implications of Using Pricing Algorithms

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Today’s Presenter

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Overview of relevant U.S. antitrust laws

Overview of algorithms

How current antitrust law applies to pricing algorithms

Unanswered questions
Two laws are most relevant to pricing algorithms

1. Section 1 of the Sherman Act, 15 U.S.C. § 1
   Enforced by the U.S. Department of Justice
   - Requires an agreement between two or more persons or companies
   - Horizontal agreements on prices, price formulas are “per se” unlawful
   - Per se violations usually prosecuted as criminal violations (with criminal fines and jail sentences for individual executives)
   - Agreements to exchange pricing information only unlawful after thorough investigation; civil penalties only (orders to stop conduct)
Relevant U.S. Antitrust Laws

Two laws are most relevant to pricing algorithms

2. Section 5 of the FTC Act, 15 U.S.C. § 45
   Enforced by the Federal Trade Commission
   • Prohibits “unfair” practices affecting commerce
   • Does not require an agreement between two or more entities
   • Civil penalties only
Overview of Algorithms

Algorithm = a set of rules to be followed in solving problems

Computer algorithms are increasingly prevalent, affecting:

- Who we talk to (on social media)
- What we buy (Amazon’s suggestion engines)
- Where we go (Google Maps)
- How much we earn (stock trading systems)
- Who we marry (dating apps)
Humans are not the only ones using algorithms!
Overview of Algorithms

Businesses use algorithms to:

- Optimize production and inventory processes
- Predict future consumer demand
- Predict consumer behavior and preferences
- Set prices, especially in markets with “dynamic” pricing (where prices change quickly as supply and demand change)
Antitrust & Algorithms

How U.S. antitrust laws apply in five different situations

When:

1. Competitors agree to fix prices and algorithms implement/enforce agreement
2. Competitors agree to use the same algorithm
3. The algorithm supplier initiates and organizes a price fixing agreement
4. Competitors separately decide to use the same algorithm
5. Competitors’ independent use of algorithms leads to higher prices
When competitors agree to fix prices, and algorithms implement or enforce the agreement

Clearly Illegal and a Criminal Violation

- Horizontal price-fixing agreements are “per se” unlawful
- Using algorithms, instead of human beings, to implement, monitor or enforce the agreement is also unlawful
When competitors agree to fix prices, and algorithms implement or enforce the agreement

Example: U.S. Department of Justice criminal case in 2015

- Topkins = director of company selling posters through Amazon Marketplace
- He agreed to fix and stabilize prices with competitors
- He wrote computer code into company’s pricing algorithm to set prices at the agreed-upon levels
- Topkins pled guilty and agreed to serve 6-12 months in prison
- DOJ: “We will not tolerate anticompetitive conduct, whether it occurs in a smoke-filled room or over the Internet using complex pricing algorithms.”
When competitors agree to fix prices, and algorithms implement or enforce the agreement

Lesson:

• It’s illegal to agree with competitors to fix prices

• It’s just as illegal to use algorithms to carry out that agreement
When competitors agree to use the same algorithm

- That is also a “per se” violation
- It’s unlawful for competitors to agree to fix prices by using formulas in order to set prices
- Illegal if competitors allow algorithm to assign “profit maximizing” price to each competitor
When the algorithm supplier initiates and organizes a price fixing agreement

If a third-party is the conduit of an agreement between each competitor to use the same algorithm:

- Third party encourages use of same algorithm and gives each competitor assurances that others are agreeing to use it
- Both third party and competitors could be liable
- Could be criminal or civil case, depending on the strength of the evidence
When competitors separately decide to use the same algorithm

If competitors **independently** decide to use the same algorithm:

- It’s not a “per se” violation, and not a violation of Sherman § 1 at all
- But it looks suspicious; each company should be careful not to communicate with others in a way that could infer a common understanding
- FTC § 5 case unlikely unless something was causing each competitor to make the same choice (like an exchange of information about what algorithms are most effective)
When competitors’ independent use of algorithms leads to higher pricing

Even if each competitor uses different algorithm, this could lead to similar or higher pricing:

- Algorithms usually track competing prices and adjust prices accordingly, so coordination likely
- They can facilitate price signaling and “follow the leader” pricing
- But without an agreement, “conscious parallelism” is not unlawful
When competitors’ independent use of algorithms leads to higher pricing

Without programmed limits or human intervention, algorithms can result in extremely high prices

- In 2011, the only two sellers of an out-of-print book on evolutionary biology independently used pricing algorithms on Amazon Marketplace
  - Seller A set its price = .9983 of Seller B’s price
  - Seller B set its price = 1.27 of Seller A’s price
  - Those two algorithms increased their prices exponentially, until it reached $23.6 million
Key Takeaways
Based on Current U.S. Antitrust Laws

**Do:**
- Use algorithms if they make sense for your company
- Regularly monitor any prices set by algorithms

**Don’t:**
Agree or communicate with competitors about:
- Price levels
- Pricing formulas
- Which algorithms to use
What changes might happen in the short term?

- Substantial changes in the law are very unlikely
- But in 2015, the FTC established the Office of Technology Research and Investigation. One of its roles will be to provide guidance on “algorithmic transparency.”
What changes will happen in the long term? These are possibilities:

- DOJ and FTC might be more aggressive in blocking mergers in artificial intelligence/IT markets, to prevent an algorithm monopoly.

- They may also start trying to stop mergers, in all industries, at lower combined market share levels. The likelihood of coordinated effects, even in unconcentrated markets, increases with the use of algorithms.

- The FTC may increase enforcement under § 5 of the FTC Act.
Unanswered Questions

What about machine learning?

• Could two algorithms learn how to agree to fix prices on their own, without human involvement?

• If so, who (or what) would be convicted for that crime?
Questions?

Email us at techlaw@perkinscoie.com.