National and International Developments

US v. Topkins: can price fixing be based on algorithms?

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I. The Road to *Topkins* (2015): From Theory to Practice

Competition law enforcement was not always easy when it was solely about human acts; now increasingly capable machines have entered the picture. Prior to the 2015 prosecution in *United States* v. *Topkins*,[1] the concern that the use of mass data collection, algorithmic processing and automated price setting – which we might call 'robo-selling' for shorthand – would have an adverse impact on competition was largely a concern of legal and economic theory. The USA is not alone in its interest in the e-commerce sphere. In the EU, the European Commission in May 2015 opened an inquiry 'to identify possible competition concerns affecting e-commerce markets.'[2] Relatedly, the French and German competition authorities recently released a report based on their joint study analyzing the implications and challenges from data collection, with the French authority already planning the launch of a full-blown sector inquiry into data-related markets and strategies.[3]

But *Topkins* represents a more specific focus on robo-selling's challenge for competition law. As I observed in December 2013, 'this shift away from humans to machines' would pose a 'critical challenge or antitrust law' which was built on the assumption of human agency; machines 'possess traits that will make them better than humans at achieving supracompetitive pricing without communication,' and thus might not need to make an anticompetitive agreement as current blackletter American antitrust law requires for liability or punishment.[4] From a legal enforcement perspective, robo-selling poses challenges since robo-sellers need not create an internal paper- or email-trail of communication evidencing anticompetitive plans, and will not be deterred by the fear of prison. In a later writing in Columbia Law School's business law blog in 2014, I noted that from an economic theory perspective, increased 'ability to gather and process massive amounts of data will reduce the probability that coordinated pricing would break down due to error or mistake in assessing market conditions'; additionally, standard models of interdependent pricing, such as Cournot's oligopoly model, predict that faster detection of defectors from either an explicit cartel or from price coordination absent agreement will make supracompetitive price equilibria more stable.[5]

Key Points

- *United States* v. *Topkins* (2015) represents the United States Department of Justice Antitrust Division's first criminal prosecution against a conspiracy specifically targeting e-commerce.
- In that case, the defendant and his co-conspirators apparently used specific pricing algorithms to implement their price-fixing agreements.
- Their alleged goal was to coordinate changes in their respective prices with the assistance of a computer code specifically designed to that effect.
- *Topkins* raises questions about how competition law should deal with the challenges of 'robo-selling' – the confluence of mass data collection, algorithmic processing and automated price setting.

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1 Plea Agreement, *United States* v. *David Topkins* [30 April 2015] <https://www.justice.gov/atr/case-document/file/628891/download>; Information, *United States* v. *David Topkins* [6 April 2015] <https://www.justice.gov/atr/case-document/file/513586/download>.

2 'Antitrust: Commission launches e-commerce sector inquiry' (6 May 2015) <http://europa.eu/rapid/press-release_IP-15-4921_en.htm>.

3 'The French Autorité de la concurrence and the German Bundeskartellamt publish joint paper on data and its implications for Competition Law' (10 May 2015) <http://www.autoritedelaconcurrence.fr/user/standard.php?id_rub=630&id_article=2770>.

4 Salil Mehra, 'De-Humanizing Antitrust: The Rise of the Machines and the Regulation of Competition' (*SSRN Electronic J*, December 2013) <https://www.researchgate.net/publication/272245466_De-Humanizing_Antitrust_The_Rise_of_the_Machines_and_the_Regulation_of_Competitionon>.

5 *See* Salil K. Mehra, 'De-Humanizing Antitrust' (*Columbia Law School Blue Sky Blog*, 16 October 2014) <http://clsbluesky.law.columbia.edu/2014/10/16/de-humanizing-antitrust-the-rise-of-the-machines-and-the-regulation-of-competition/>; Salil K. Mehra, 'Coming to a Mall Near You: Robo-Seller' (*Temple 10-Q*, 18 September 2014) <http://www2.law.temple.edu/10q/coming-mall-near-robo-seller/>; Salil K. Mehra, 'De-Humanizing Antitrust: The Rise of the Machines and the Regulation of Competition' (*Temple University Legal Studies Research Paper*, 21 August 2014)

The 2015 prosecution of David Topkins brought the legal treatment of algorithm-related antitrust harm from abstract concern to concrete reality, unleashing a flood of commentary focusing on the case.[6] Indeed, the Organization for Economic Cooperation and Development (OECD) Secretariat's issues paper, 'Competition Enforcement in Oligopolistic Markets' (2015), recognized that:

> [i]n a relatively new area of research, Mehra (2014) and Ezrachi and Stucke (2015) argue that increased digitization of market data and proliferation of algorithmic selling may increase the risk of tacit collusion and stretch traditional antitrust concepts developed for human actors.[7]

The OECD paper continued on to observe that, in light of the *Topkins* prosecution, '[t]he concern is not entirely theoretical.'[8] As Professors Ariel Ezrachi and Maurice Stucke recognized in their post on Columbia Law School's business law blog in May 2015, the *Topkins* prosecution could be seen as the Justice Deparment 'warn[ing] antitrust lawyers, economists and scholars of the dangers of complex pricing algorithms.'[9] Former Department of Justice Antitrust Division head Charles ('Rick') Rule points out that the larger investigation into the 'wall décor' (poster) industry surrounding the case 'also raises novel questions with respect to the applicability of criminal antitrust law to future iterations of algorithmic-based software, including potential learning computers,' since after *Topkins*, in his view, a company that uses 'algorithm-based pricing software must take particular care that its rules are decided independently of the rules of other competitors.'[10] And the case itself broke through into the tech/trade press, such that prominent multiplatform tech media provider – either not familiar with antitrust's *per se* rule or perhaps (wrongly) having assumed laws apply differently online – asked: 'Are feds in essence saying that fixing prices on Amazon means you are fixing prices *period*?'[11]

II. The Topkins Case

This leads into the following questions: What exactly was David Topkins accused of doing? And what did he plead guilty of doing? These answers to these questions largely overlap, although the information does contain a bit more detail about the facts of the case than the plea agreement.[12] The information charged Topkin with a criminal violation of Section 1 of the Sherman Act (15 U.S.C. §1) for entering into a price-fixing conspiracy.

The price-fixing conspiracy in *Topkins* was unprecedented for two different reasons: its e-commerce context, and its use of computer software to carry out algorithmic price-setting in line with the conspirators' agreement. Because the case did not proceed to trial, the publicly available information is somewhat limited – essentially that which can be gleaned from the information and the plea agreement. Nevertheless, the basic outline of the conspiracy can be discerned. First, the conspirators were alleged to have agreed to sell posters and similar wall décor via Amazon Marketplace, Amazon.com, Inc.'s ('Amazon') website for third-party sellers, and also to have explicitly agreed to coordinate their pricing via the use of the same software-embedded algorithm. As a result, from a legal perspective, the case might not at first appear entirely novel; prosecutions have been brought before on the grounds that conspirators explicitly agreed to take steps that would assist price coordination.[13] That said, the e-commerce context and the use of automated, algorithmic price-setting make the *Topkins* prosecution, in fact, unprecedented. Via Amazon Marketplace, Amazon, the largest Internet-based retailer in the United States, makes its customer

<http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2490651> (later published as Salil K. Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' [2016] 100 Minnesota L Rev 1323, 1343-49 <http://www2.law.temple.edu/10q/coming-mall-near-robo-seller/. http://www.minnesotalawreview.org/wp-content/uploads/2016/04/Mehra_ONLINEPDF1.pdf> (working through implications of robo-selling for Cournot model of interdependent pricing)).

6 Charles F. Rule, 'A Closer Look at DOJ's 1st E-Commerce Price-Fixing Case' (*Law360*, 12 May 2015) <http://www.law360.com/articles/653912/a-closer-look-at-doj-s-1st-e-commerce-price-fixing-case> (discussion by former Assistant Attorney General in charge of the Department of Justice Antitrust Division); Daniel Rivero, 'This Guy Got Busted by the Feds for Writing Code to Fix Poster Prices on Amazon' (FUSION, 7 April 2015) <http://fusion.net/story/115823/this-guy-got-busted-by-the-feds-for-writing-code-to-fix-poster-prices-on-amazon/ *See also* articles cited in footnote 5>.

7 Competition Enforcement in Oligopolistic Markets [2015] 5 <http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP%282015%292&docLanguage=En> (omitting parenthetical) (issues paper by the Secretariat prepared for the 123rd meeting of the OECD Competition Committee on 16-18 June 2015).

8 ibid n 10.

9 Ariel Ezrachi and Maurice Stucke, 'From Smoke-Filled Rooms to Computer Algorithms – The Evolution of Collusion' (*The Columbia Law School Blue Sky Blog*, 14 May 2015) <http://clsbluesky.law.columbia.edu/2015/05/14/from-smoke-filled-rooms-to-computer-algorithms-the-evolution-of-collusion/>; Ariel Ezrachi and Maurice Stucke, 'Artificial Intelligence and Collusion: When Computers Inhibit Competition' (working paper, 8 April 2015) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591874>; Jill Priluck, 'When Bots Collude' (*The New Yorker*, 25 April 2015) <http://www.newyorker.com/business/currency/when-bots-collude>.

10 Rule (n 4).

11 Rivero (n 4); Nick Farrell, 'e-commerce has its first antitrust case' (*Techeye*, 7 April 2015) <http://www.techeye.net/business/e-commerce-has-its-first-antitrust-case>.

12 Compare *Topkins*, Plea Agreement (n 1), with *Topkins*, Indictment (n 1).

13 *See* Rule (n 4) (discussing Department of Justice 1990s prosecution of domestic US airlines in the ATP Co. case for explicitly agreeing to use less sophisticated means to assist price coordination).

base available to third-party sellers and also expands the goods available on its website without additional inventory investment. Amazon handles the payment between buyer and seller and charges the seller a fee for each sale, typically 15% of the sale price. Although Amazon makes the Amazon Marketplace commercial platform available to buyers and sellers, as the indictment noted, the third-party sellers, not Amazon, control all pricing and shipping decisions on the products they offer on Amazon Marketplace – Amazon was not itself charged as part of the conspiracy.

The Justice Department emphasized the unprecedented e-commerce context; Assistant Attorney General Bill Baer stated that 'American consumers have the right to a free and fair marketplace online, as well as in brick and mortar businesses.'[14] Similarly, initial reaction to the indictment focused on the expansion of antitrust into online commerce. [15] That said, the e-commerce aspect of the *Topkins* prosecution should probably not have been so surprising. As more consumers than ever shop on the Internet, some sort of e-commerce price fixing case may have been inevitable. Moreover, there was no obvious reason before *Topkins* to think that the antitrust laws would not in principle apply to e-commerce.

By contrast, the other novel aspect of *Topkins,* the defendant's use of computer software to set prices for the conspirators algorithmically, potentially signals a challenging new area of enforcement for US antitrust agencies. According to the information, the conspirators allegedly 'used commercially available algorithm-based pricing software to set the prices of posters sold on Amazon Marketplace' – the software 'operates by collecting competitor pricing information for a specific product sold on Amazon Marketplace and applying pricing rules set by the seller.'[16] The conspirators then allegedly agreed to adopt pricing rules that would coordinate their sales at 'colllusive, non-competitive prices on Amazon Marketplace'; Topkins was alleged to have 'wr[itten] computer code that instructed' the 'algorithm-based software to set prices of the agreed-upon posters in conformity with th[e] agreement' between the conspirators. To the same end, the plea agreement stated that the government would have proven at trial that 'the defendant and his co-conspirators agreed to adopt specific pricing algorithms for the sale of the agreed-upon posters with the goal of coordinating changes to their respective prices.'

The Department of Justice was not alone in considering the implications of robo-selling; in April 2015, the FTC established its Office of Technology Research and Investigation, charged in part with overseeing algorithm-powered commerce.[17] By embracing this challenge, the agencies have taken a big step that will force them to deal with rapidly changing technology, a significant gap in existing antitrust law and to grapple with questions about how institutionally to remedy problems that robo-selling creates.

First, regulators' focus on robo-selling is the result of rapid technological change. Increased connectivity and more powerful computers have led to greater ability to collect mass data about prices, sales and market conditions. Additionally, these changes have created increased capacity to analyze this information and to set prices in rapid, automated fashion. As a result, firms such as Mercent (recently acquired by CommerceHub), Appeagle, FeedVisor, Teikametrics and SellerExpress provide businesses with repricing software that can automatically change product prices based on what observed competitor prices.[18] In many cases, these technologies have been adapted from earlier use in automated trading in the financial sector.[19] Such capabilities promise cost savings, particularly through reductions in the cost of businesses' sales and market intelligence functions.

Second, however, this technology exacerbates an existing gap in the Sherman Act's coverage. Almost a half-century ago, Professor Donald Turner and then-Professor Richard Posner debated whether antitrust law should apply to interdependent supra-competitive pricing by competitors even in the absence of an agreement between them.[20] For Posner, as for many economists, the existence or lack of an agreement was fundamentally a legal formalism quite separate from the question of whether consumer welfare had been harmed. But contemporary interpretation of the Sherman Act continues to follow Turner's view that an agreement is required to find a violation. This is despite longstanding

14 USDOJ, 'Former E-Commerce Executive Charged with Price Fixing in the Antitrust Division's First Online Marketplace Prosecution' (*US Department of Justice, Justice News*, 6 April 2015) <https://www.justice.gov/opa/pr/former-e-commerce-executive-charged-price-fixing-antitrust-divisions-first-online-marketplace> (announcing the charges).

15 Charlie Osborne, 'US DoJ Announces First e-commerce Antitrust Prosecution' (*ZDNet*, 7 April 2015) <http://www.zdnet.com/article/us-doj-announces-first-e-commerce-antitrust-prosecution/>.

16 *Topkins*, Information (n 1) 2-3.

17 Katherine Noyes, 'The FTC is Worried About Algorithmic Transparency and You Should be Too' (*PC World*, 9 April 2015) <http://www.pcworld.com/article/2908372/the-ftc-is-worried-about-algorithmic-transparency-and-you-should-be-too.html> (noting, however, that the office was housed under the FTC's Bureau of Consumer Protection, not its Bureau of Competition).

18 Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' (n 3) 1338-39 (discussing these firms and their products).

19 ibid.

20 ibid 1341-43 (discussing the Posner-Turner debate).

theory and empirics demonstrating that supracompetitive interdependent pricing by oligopolists is both possible and robust even in the absence of an agreement. Robo-selling may worsen this problem, since it will increase the speed with which price cutting will be detected, and reduce errors, making supracompetitive oligopoly equilibria more stable.[21] Moreover, as a practical matter, the evidence-gathering and deterrence effects that antitrust agencies aim at businesses' employees to deter anticompetitive behavior may prove less effective when those employees and their email trail are replaced by software, algorithms and automation.[22]

That said, finally, regulators do not face an easy institutional choice here. Robo-selling promises many cost-reduction benefits – as well as potentially, better service for consumers – that may require tradeoffs versus potential harms to competition. This will not be an easy balance to strike, coming as it does within the context of rapid and hard-to-predict innovation. Post hoc rule of reason style enforcement may lead to uncertainty and erratic results. As a result, 'competition by design' may be the best approach; some form of industry-regulator cooperation on pro-consumer, pro-efficiency norms for pricing software may be necessary.[23]

That said, despite such difficulties antitrust law will not be able to avoid engagement with mass data collection, algorithmic processing and automated price setting. Indeed, in *United States* v. *Aston,* the Department of Justice brought a subsequent prosecution in the online poster sales context against a UK firm and its chief executive, [24] who reportedly faces potential imprisonment, as well as a civil enforcement action by the UK's Competition and Markets Authority.[25] However, the implications of these technologies are unlikely to be limited to wall décor.

III. The Road Beyond *Topkins:* Get an Uber?

The *Topkins* case may just be the tip of the iceberg for a new field of antitrust activity. In particular, mass data collection, algorithmic processing and automated price setting will have applications beyond Amazon Marketplace. In fact, a number of dynamic new business models, particularly in the so-called 'sharing economy,' involve the use of some or all of these technologies to match buyers and sellers in algorithm-driven internal systems that, to some extent, replace more public markets. Firms such as Uber, Airbnb, Match.com and others orchestrate transaction networks that go beyond commodities and prices to try to improve quality and trust in the exchanges that they facilitate.[26]

At first, antitrust concern about the replacement or augmentation of traditional markets by technology-powered matching algorithms might appear to be the domain of abstract theory. However, earlier such matching processes, such as the U.S. system for placing medical students into entry-level training-intensive employment ('residencies') have in the past raised antitrust suspicion.[27] In that context, it was alleged that, despite significant social economic and non-economic benefits, the matching process was designed to systematically undercompensate the newly minted doctors.[28] Before that case was adjudicated, the US Congress granted the 'match,' as the process is termed, a statutory antitrust exemption.[29]

Despite that false start, competition law may soon be forced to grapple with tough questions about market-displacing or –altering matching algorithms.

In a pending private antitrust class action, Judge Jed Rakoff of the Southern District of New York recently ruled that antitrust plaintiffs may proceed towards trial against Uber with price-fixing allegations.[30] In that case, the plaintiffs have alleged that the Uber app, with its automated price-setting algorithm, is designed for price fixing because, instead of competing, they have agreed amongst themselves – including the firm's CEO Travis Kalanick, who also serves as a driver at times – to charge those prices, with Uber taking a cut of the fares.[31] Essentially, the plaintiffs make two separate but related charges: that Uber uses its algorithm-powered app to operate as a ringleader in a hub-and-spoke

21 ibid 1344-49 (walking through the implications of mass data collection, algorithmic processing and automated pricing for increased stability of supracompetitive oligopoly pricing under a Cournot model).

22 ibid 1350-51.

23 ibid 1368-73.

24 Indictment, *United States* v. *Aston* [27 August 2015] <https://www.justice.gov/atr/file/840016/download>.

25 Jeannette Oldham, 'FBI Raids Rubery Company as Director Indicted in Amazon Price-Fixing Probe' *The Birmingham Mail* (21 January 2016) (reporting cooperation of UK authorities in conjunction with the prosecution) <http://www.birminghammail.co.uk/news/midlands-news/fbi-raids-rubery-company-director-10763673>.

26 Barry Libert, Yoram Wind and Megan Beck Fenley, 'What Airbnb, Uber and Alibaba Have in Common' (*Harvard Business Review*, 20 November 2014) <https://hbr.org/2014/11/what-airbnb-uber-and-alibaba-have-in-common>.

27 Kristin Madison, 'The Residency Match: Competitive Restraints in an Imperfect World' [2005] 42 Houston L Rev 759.

28 ibid.

29 ibid.

30 Opinion and Order, *Meyer* v. *Kalanick* [2016] S.D.N.Y. <https://arstechnica.com/wp-content/uploads/2016/04/Untitled.pdf> (denying motion to dismiss).

31 ibid.

conspiracy, and that, additionally, Kalanick, as a sometime driver for the service, is part of direct horizontal conspiracy with the other Uber drivers. That latter may, ironically, put Kalanick under pressure for satisfying the agreement requirement – the kind of legal formalistic result that Posner worried about a half-century ago.

Where this case will lead is of course yet undetermined. Unlike the Justice Department's *Topkins* prosecution, private plaintiffs do not need to consider the social welfare impact that their claim may have on ridesharing more generally. The Uber defendants certainly should have a strong argument that it has improved consumer welfare in terms of price, quantity and quality vis-à-vis the pre-ridesharing days. However, that may not be enough. Even if it is proven that Uber has had radically positive effects for consumers so far, the Uber defendants still might have to overcome the argument that a less restrictive alternative could be employed. How to answer these conventional antitrust questions will be complicated by the unconventional context in which they will have to be considered. Competition law may have to evolve its own techniques as the phenomena and markets that it regulates also evolve.

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