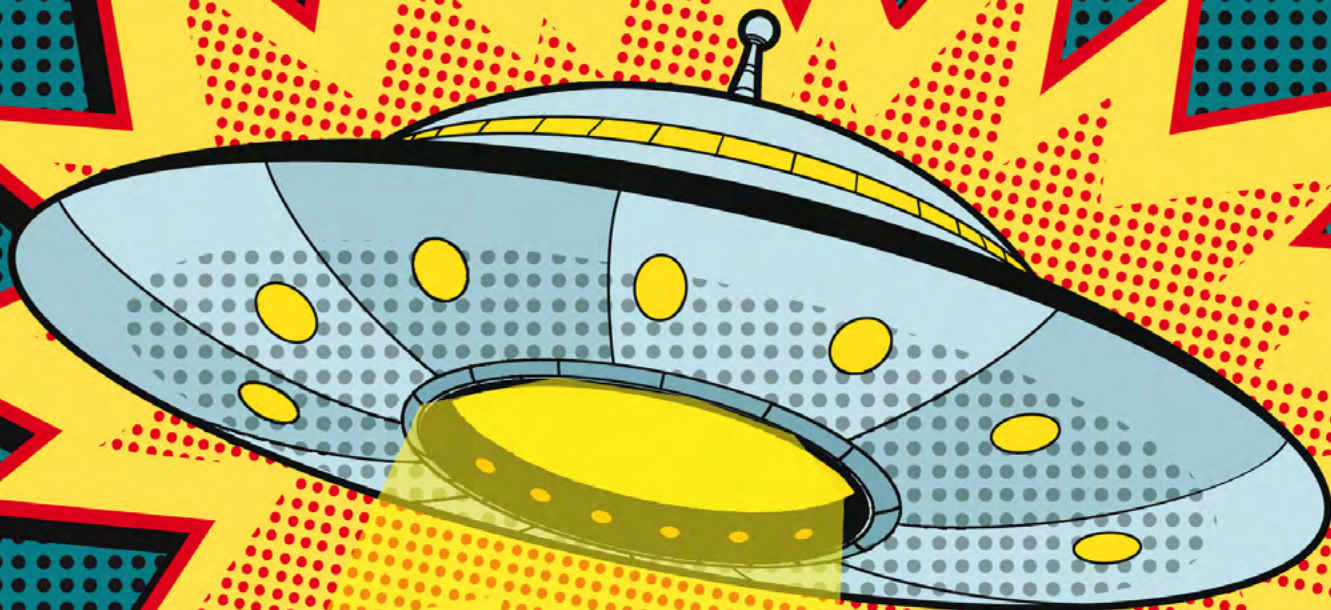


# Antitrust Chronicle

MAY · VOLUME 2 · SPRING 2017



## THE ALGORITHMS HAVE LANDED!

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# LETTER FROM THE EDITOR

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Dear Readers,

Algorithms seem to be on the tips of many antitrust regulators' tongues these days...

- In 2015, William Baer, then principal deputy associate attorney-general at the Department of Justice, stated that “[w]e will not tolerate anti-competitive conduct, whether it occurs in a smoke-filled room or over the internet using complex pricing algorithms.”
- At a conference in February, CMA Chairman, David Currie stated that regulators need to “ensure that the rise of algorithms works to enhance competition, not close it down.”
- At a conference organized by the Bundeskartellamt in March, European Competition Commissioner Margrethe Vestager stated that “we need to keep an eye out for cartels that use software to work more effectively. If those tools allow companies to enforce their cartels more strictly, we may need to reflect that in the fines that we impose.”

Market players are using data and algorithms in innovative ways, with both procompetitive and potentially anticompetitive effects. How should policy makers, academics and regulators react?

Should, or how should, antitrust authorities spend their precious resources on the potential threat of tacit collusion in the algorithm driven economy? Or are we searching for an oasis in the desert?

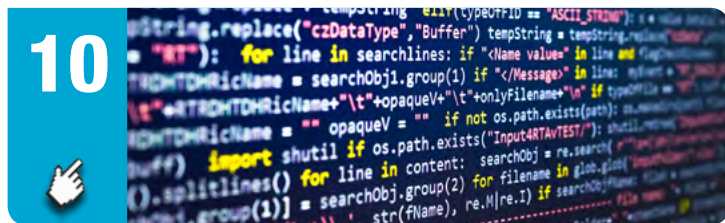
In our CPI Talks section, we hear from Antonio Gomes, Head of the Competition Division at the OECD, to get his views on the new challenges competition authorities face in light of the rise of algorithms as well as details about the OECD's roundtable to be held in June 2017 on Algorithms and Collusion.

We hope you enjoy reading our May edition of the CPI Antitrust Chronicle.

Thank you to our great panel of authors this month.

**Sincerely,**

**CPI Team**

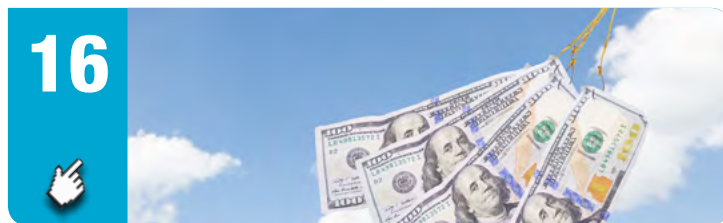


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## Should We Be Concerned That Data And Algorithms Will Soften Competition?

By Paul A. Johnson

Firms are using algorithms to analyze customer and competitor data in innovative ways. Will this practice soften competition by allowing firms to tacitly collude? Will it allow firms to market to customers in ways that soften competition? This article argues against answering these questions categorically because, depending on the facts of each case, these practices can either soften or sharpen competition. And while the use of algorithms to analyze data is not new, the increased use of more sophisticated algorithms that leverage better and more expansive data will likely amplify both procompetitive and anticompetitive effects. Nevertheless, antitrust authorities can expect to face challenges when taking selective enforcement action against the use of algorithms that facilitate tacit collusion or otherwise soften competition.



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## Looking Up In The Data-Driven Economy

By Maurice E. Stucke & Ariel Ezrachi

How competitive is our market economy? Not as much as it ought to be. And the growth of big data threatens to make things even worse. Antitrust regulators already struggle to keep markets competitive. How will they fare in economies increasingly dominated by a few super-platforms?



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## Algorithmic-Facilitated Coordination: Market And Legal Solutions

By Michal S. Gal

This short note focuses on three issues. First, it explores the effects of algorithms on the ability of suppliers to coordinate their conduct. Second, it explores the ability of existing technological and regulatory tools to deal effectively with algorithmic-facilitated coordination. The final part briefly explores the promises as well as the limits of market solutions to welfare-reducing algorithmic coordination, which can be complementary or provide at least some viable alternative for the possible failure of regulation to deal with algorithmic-facilitated coordination.



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## Algorithms, Artificial Intelligence And Joint Conduct

By Dylan I. Ballard & Amar S. Naik

Sophisticated pricing algorithms and artificial intelligence have attracted the attention of antitrust and competition enforcers. These new technologies may require some new ways of thinking about joint conduct such as price-fixing conspiracies. But to what extent do these innovations really alter traditional antitrust analysis under Section 1 of the Sherman Act? This article briefly analyzes existing legal doctrines and principles to see if they can offer antitrust and competition practitioners any guidance before we jump into this “brave new world.”

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## Robo-Seller Prosecutions And Antitrust's Error-Cost Framework

By Salil K. Mehra

Speculation has grown that algorithmic prosecutions may become a new focus for antitrust agencies. The rise of the robo-seller promises a tremendous degree of cost savings, as well as potentially robust allocative and dynamic efficiency gains. Overzealous prosecution may chill significant gains to both producers and consumers through better-functioning markets. That said, moves towards openness concerning the use of algorithms have the potential to improve the accuracy for antitrust enforcement.

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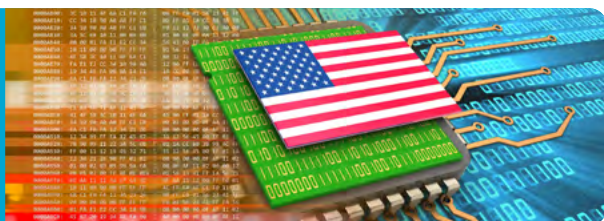


## The Power Of The Bargaining Robot

By Ramsi A. Woodcock

The primary threat of the rise of the machines is not to competition itself, but to the bargaining power of consumers, given any level of competition in the market. By enabling firms to interact with each consumer on an individual basis, technology will permit firms to tailor price to the highest level each individual consumer is willing to pay and to use tailored marketing to break each consumer's will to hold out for a better deal, reducing consumer welfare for any given level of competition. By giving consumers more outside options, the promotion of competition can limit the effects of technology-enhanced bargaining power. Antitrust may promote greater competition by reinvigorating merger enforcement and restrictions on exclusionary conduct, embracing no-fault monopolization, banning oligopoly, promoting intrabrand competition, or promoting competition within the firm as a substitute for competition between firms.

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## When Antitrust Becomes Pro-Trust: The Digital Deformation Of U.S. Competition Policy

By Frank Pasquale

Digital platforms have exacerbated an old problem in American anti-trust law — the tension between the efficiencies that mergers achieve in theory, and the pressure they inevitably create for firms in or adjacent to the industry of the merged firms, to themselves combine in order to better compete. But U.S. antitrust authorities have, by and large, refused to address this dynamic. They have instead clung to three myths to rationalize market power online: 1) The Myth of Easy Platform Switching; 2) The Myth of the Heroic Consumer; and 3) The Myth of Platforms Perfecting Markets. It is critical to debunk these three myths now, before they deform competition law beyond recognition.

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## Complex Antitrust Harm In Platform Markets

By John M. Newman

Innovation yields massive welfare benefits — but it can also pave the way for novel types of anticompetitive harm. Under certain conditions, digital platforms can harness the power of reputation to steer users to favored suppliers. This steering forecloses non-favored suppliers in a related, though distinct, relevant market. Where favored suppliers are able to split the resulting rents with the platform, the strategy is rational. The resulting foreclosure reduces efficiency and consumer welfare. Antitrust enforcers and courts should take the possibility of such harm into consideration when analyzing conduct in platform markets. This article identifies the requisite conditions for this complex harm. It then uses the recent Zillow–Trulia merger as a case study to illustrate how such harm can occur. It concludes that the FTC's clearance of the merger may have constituted a false negative, and that the merger may be harming consumers.

# SUMMARIES

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## Consumer's Search In The Era Of Big Data

*By Michele Polo*

Consumer's choice requires the collection of information to make a conscious and satisfactory decision. This structural feature of consumption has dramatically changed with the Internet and the diffusion of big data. This note reviews the impact of web-based searches on consumers' satisfaction and surplus, distinguishing the case of search and experience goods.

# ANNOUNCEMENTS

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## REACHING OUT IN 2017

CPI wants to hear from you, our subscribers. In the coming months of 2017, we will be reaching out to members of our community for your feedback and ideas. Let us know what you want (or don't want) to see, at: [antitrustchronicle@competitionpolicyinternational.com](mailto:antitrustchronicle@competitionpolicyinternational.com).

## CPI ANTITRUST CHRONICLE JULY & AUGUST 2017

The July 2017 Antitrust Chronicle will address issues related to **Healthcare Mergers**. This edition focus on recent hospital and insurance mergers rejected over antitrust concerns. What are some of the major takeaways?

As a reminder to potential authors, our tentative topic for the August 2017 Antitrust Chronicle is **Antitrust Antipasto**.

Contributions to the Antitrust Chronicle are about 2,500 – 4,000 words long. They should be lightly cited (follow bluebook style for footnotes) and not be written as long ponderous law-review articles with many in-depth footnotes. As with all CPI publications, articles for the CPI Antitrust Chronicle should be written clearly and with the reader always in mind.

Interested authors should send their contributions for the July edition by June 20, 2017 to Sam Sadden ([ssadden@competitionpolicyinternational.com](mailto:ssadden@competitionpolicyinternational.com)) with the subject line “Antitrust Chronicle,” a short bio and picture(s) of the author(s).

The CPI Editorial Team will evaluate all submissions and will publish the best papers. Authors can submit papers in any topic related to competition and regulation, however, for the April and May issues, priority will be given to articles addressing the above mentioned topic. Co-authors are always welcome.

## WHAT'S NEXT?

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This section is dedicated to those who want to know what CPI is preparing for the next month. Spoiler alert!

We look forward to bringing our subscribers the June Antitrust Chronicle of 2017 which will address **Index Funds, Institutional Investors and Antitrust**. Do index funds make companies less competitive? We hope to address this, and other questions, in our June Chronicle.





## WITH ANTÓNIO GOMES<sup>1</sup> OF THE OECD

Thank you, Mr. Gomes, for granting this interview to CPI.

**1. Does a “meeting of the minds,” where co-conspirators agree to collude with one another, really exist in an algorithm driven economy? Under these new circumstances, what actually constitutes collusion?**

In the past years, the exponential growth of data-business models based on complex automated systems is inducing many changes in the digital economy. In particular, by improving market transparency and enabling high-frequency trading, there is a risk that a generalized use of algorithms by competitors could make markets more prone to collusion even when they do not have the structural characteristics usually associated with the risk of collusion. The use of algorithms is challenging traditional concepts and the question is whether these concepts can be stretched to cover entirely new situations.

When pricing algorithms and other automated systems are combined with “explicit” agreements between competitors (therefore, involving direct communication), this does not differ from explicit collusion and are clearly covered by competition law. However, a particular concern arise when algorithms facilitate “tacit” coordination by providing companies with automated mechanisms to signal, to implement a parallel/common policy, as well as to monitor and punish deviators. Here the concern is that algorithms can help firms achieve tacitly collusive arrangements in a context where collusion could not be possible before, significantly increasing the scope for harm to consumer welfare.

Whether a “meeting of minds” exists and whether it can be scrutinized under competition law is not clear, and the combined development of artificial intelligence and algorithms makes this determination even more difficult. Unfortunately, this is still a very new area of antitrust and there are only a few competition cases providing evidence of coordination between algorithms, possibly due to the difficulties of detecting such sophisticated conduct. Nonetheless, the risk for increased collusive outcomes because of algorithms is very real and competition law enforcers should remain alert.

**2. To what degree should antitrust agencies reconsider traditional antitrust concepts of agreement and collusion?**

This question goes to the heart of the problem. I do not think there is a need to reconsider the notion of collusion, which is an economic concept. Competition laws, however, do not prohibit collusion as such; they prohibit anticompetitive agreements. Collusion can be the result of such an anticompetitive agreement, but it can also be the result of lawful firms’ interdependence, especially in oligopolistic contexts. This is the “oligopoly problem,” where the same economic outcome (collusion) is prohibited if it is the result of some form of explicit coordination, but it is not if it is the result of conscious parallelism.

To address this policy problem, courts have expanded, not without difficulties, the reach of competition laws to address facilitating practices and, in order to cover as many situations as possible of competitors’ interaction, traditional concepts such as “agreement” have been interpreted widely to include any “meeting of the minds” between competing companies. Recognizing the inherent limits of the concept of agreement, some jurisdictions have added the notion of “concerted practices” to be able to grasp a wider set of potentially anticompetitive practices.

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<sup>1</sup> OECD, Head of the Competition Division, Directorate for Financial and Enterprise Affairs. The views expressed in these remarks are my own.



Algorithms are further blurring the notion of agreement, and it is not yet clear whether it is necessary to revise it in order to include interaction between competitors via algorithms.

### **3. What are possible solutions, without undermining overall competition and in light of the possible efficiencies generated by the use of algorithms?**

This is a rather complicated issue, as many of the effects driven by algorithms are new and over enforcement could easily chill procompetitive conduct and result in consumer harm. My take is that we still do not know very much about how algorithms work and how the development of artificial intelligence may impact firms' business models and competition more broadly. Given that we are still at early stages, an important first step is to conduct market studies and sector inquiries to investigate whether algorithms commonly result in coordinated effects and, if so, under which conditions. This should provide competition authorities with more clear information to address the problem.

### **4. What antitrust liability, if any, can be imposed on the creators and users of algorithms?**

I would put this question into a different perspective: can we identify any explicit harm to the competitive process? If so, how can we prove it? If a conduct or a practice is found to be anticompetitive, then comes the question of liability. In general, algorithms are programs that follow human instructions. Therefore, where the behavior is unlawful, it would be normal to impose liability on the creators.

On the other hand, the development of artificial intelligence and machine learning enables algorithms to more efficiently achieve a collusive outcome without being specifically programmed to do so. This would be the most complex and subtle way for companies to collude, without explicitly programming algorithms to do so. In other words, there is the risk that some algorithms with powerful predictive capacity, by constantly learning and readapting to the actions of other market players (who may be human beings or artificial agents themselves), will be able to collude without the need for any human intervention.

### **5. We understand that the OECD will be holding a roundtable in June 2017 on Algorithms and Collusion. Can you give us more details?**

The OECD roundtable on "Algorithms and Collusion" is part of the wider work stream of the OECD Competition Committee on Competition, Innovation and the Digital Economy. This work stream will keep us and the Competition Committee busy for the next couple of years. We started in November 2016 with a Hearing on Big Data, which identified many of the challenges of Big Data for competition law enforcement and market regulation. One of the topics discussed was the role that computer algorithms could have in enabling new forms of collusion, which will now be address in more detail in June. At the same time, work is underway on whether agencies need to rethink the application of traditional economic tools (such as market definition, market power, efficiencies, etc.) to multisided markets and platforms.

The Roundtable on Algorithms and Collusion will comprise a panel of experts, Michal Gal, Ariel Ezrachi and Avigdor Gal who will explain in simple terms the technology behind algorithms and artificial intelligence, who will discuss the competition challenges brought by algorithms and debate potential solutions based on the existing antitrust literature and on their own recent research. We also look forward to the participation of competition agencies who will share their experiences in competition cases, which can be of enormous value given the lack of well-established best practices in this area. Finally, the roundtable discussion will be supported by a background note that the OECD Secretariat is currently preparing.

### **6. Mr. Gomes, if there are any topics or issues that you would like to specifically discuss or address, you can do so here.**

There have been some proposals to regulate algorithms and artificial intelligence systems, and some of the measures discussed include making algorithms more transparent and accountable for their effects. Any regulatory interventions should, however, be carefully assessed as they may also involve risks if they result in new barriers to entry and reduce the incentives of companies to invest in developing algorithms which could generate efficiencies.

# SHOULD WE BE CONCERNED THAT DATA AND ALGORITHMS WILL SOFTEN COMPETITION?

BY PAUL A. JOHNSON<sup>1,2,3</sup>



## I. INTRODUCTION

Firms have always used data and algorithms. A general store at the beginning of the nineteenth century did not have modern information technology but may have marked up the goods it sold by a constant percent (a very simple algorithm) over costs (data). The large American multi-divisional firms of the beginning of the twentieth century are another example in that they collected large amounts of information from their various divisions and used those data to allocate resources and control behavior.

But now some firms appear to be using new types of data in different and creative ways. Facilitated by advances in information technology, the data differ in their size and scope. And, as opposed to a focus on internal control of an organization (e.g. costs, divisional performance), these data frequently have more of an external focus. For example:

- The data may contain information on *competitors*. For example, many companies now develop and use some sort of customer relationship management data through software like salesforce.com to manage relationships with current and potential customers but also to understand the actions of their competitors, like the prices they have bid or whether they have actively pursued new business. Another example involves a third party collecting, organizing and publishing data sent by industry participants: some gasoline retailers in Australia and an information service “exchange site by site petrol prices covering most of Australia every 15 or 30 minutes.”<sup>4</sup>

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<sup>1</sup> Partner, Bates White Economic Consulting.

<sup>2</sup> T.D. MacDonald Chair in Industrial Economics, Competition Bureau of Canada. Email: paul.johnson5@canada.ca.

<sup>3</sup> The views expressed in this article are my own and do not necessarily represent the views of Bates White, the Commissioner of Competition, The Bureau of Competition, Department of Justice, or the Public Prosecution Service of Canada. I thank many colleagues for their comments without implicating them in any errors.

<sup>4</sup> The Australian Competition & Consumer Commission recently resolved its investigation into that use of data by requiring that consumers have the same access to the same information

- The data may contain information on *customers*. For example, for some time now, some supermarkets have been developing and maintaining shopping data from their loyalty card programs.<sup>5</sup> On the basis of those data, supermarkets can (and do) make offers to their customers that are personalized on the basis of their past shopping habits and even their current location within a store. Retailers may also combine customer data with other data like data on the environment. For example, Wal-Mart deployed algorithms that detected that purchases of strawberry pop-tarts increased seven-fold just before a hurricane. With this knowledge, Wal-Mart began placing strawberry pop-tarts at the checkout before hurricanes.<sup>6</sup>

Not only do the data differ, but the algorithms are more diverse and sophisticated than those used by the hypothetical old general store. One type of example involves use of algorithms by platforms — that is a firm that serves different distinct types of users. Uber uses data on both riders and drivers to adjust prices to ensure that demand and supply are balanced: “to ensure reliability and availability for those who agree to pay a bit more” as well as to encourage “more drivers to get back on the road.”<sup>7</sup> Amazon uses an algorithm that makes it more likely that sellers who maintain low prices relative to their competitors will be featured prominently in a “buy box.”<sup>8</sup> Other examples involve a platform’s efforts to create more valuable matches between different types of users. A perhaps trite example is a dating site that matches potential couples through an algorithm instead of allowing members to select potential partners.<sup>9</sup> Other prominent examples include Google, which matches advertisers and users based on a variety of criteria including the context of the website and the interests and demographics of the website visitor,<sup>10</sup> and American Express, which has developed targeted promotions leveraging investments “in information systems that studied the purchase habits and inclinations of cardmembers.”<sup>11</sup> This article will not address how platforms use data and algorithms; instead it will focus on firms that serve a single type of user. For example, a supermarket may use information on customers as input into an algorithm that promotes items that are complementary to items previously purchased; a customer who has previously purchased diapers might receive a promotion for baby formula. Alternatively, a third-party merchant selling on Amazon marketplace might use information on competitor prices as input into a pricing algorithm to maximize the chance that it is featured prominently in the buy box.

This article will address two main questions. First, is whether firms, which unilaterally develop, deploy and use data and algorithms, are likely to have their own incentives and abilities changed so that competition will be softened. Second, is whether such softening should be worthy of attention from antitrust authorities. The focus of the article is on unilateral development, deployment and use of data and algorithms and excludes “hard-core” cartel activity. The belief that such behavior lessens competition among competitors and is something worthy of the attention of antitrust authorities is not controversial.<sup>12</sup> That focus also excludes data and algorithms that are used by multiple firms within an industry, including unilateral disclosure of information by one firm, which may be viewed as a facilitating practice that softens competition.<sup>13</sup> The focus on how adoption of algorithms and data affect the adopter’s

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that the retailers have. Australia Competition & Consumer Commission. “Petrol price information sharing proceedings resolved.” MR 273/15, Dec. 23, 2015.

5 Stephanie Clifford, “Shopper Alert: Price May Drop for You Alone,” *New York Times*, Aug. 9, 2012.

6 Dezyre.com, “How Big Data Analysis helped increase Walmart’s Sales turnover?” <https://www.dezyre.com/article/how-big-data-analysis-helped-increase-walmarts-sales-turnover/109>.

7 Uber. “Uber Surge Pricing.” <http://uberestimator.com/uber-surge-pricing>.

8 Le Chen, Alan Mislove, and Christo Wilson, “An empirical analysis of algorithmic pricing on Amazon marketplace,” In *Proceedings of the 25th International Conference on World Wide Web*, pp. 1339-1349. International World Wide Web Conferences Steering Committee, 2016.

9 John Tierney, “A Match Made in the Code,” *New York Times*, Feb. 11, 2013.

10 Google. “How ads are targeted to your site” <https://support.google.com/adsense/answer/9713?hl=en>.

11 John A. Quelch and Jacquie Labatt, “The American Express Card,” HBS No. 9-509-027, Boston: Harvard Business School Publishing, 2011, p. 8.

12 Assistant Attorney General Baer reflected his view of hard-core cartel activity in stating “We will not tolerate anticompetitive conduct, whether it occurs in a smoke-filled room or over the Internet using complex pricing algorithms.” U.S. Department of Justice. “Former E-Commerce Executive Charged with Price Fixing in the Antitrust Division’s First Online Marketplace Prosecution,” April 6, 2015, available at <https://www.justice.gov/opa/pr/former-e-commerce-executive-charged-price-fixing-antitrust-divisions-first-online-marketplace>.

13 An illustrative case is Canada’s *Atlantic Sugar* case, where the evidence showed that one defendant’s competitors were immediately aware when it posted prices in its lobby and “in time were able to discover Redpath’s pricing formula by a process of deduction from available data.” *Atlantic Sugar Refineries Co. Ltd. et al. v. Attorney General of Canada*, [1980] 2 S.C.R. 644, 656. See also *US v. Airline Tariff Pub. Co.*, 836 F. Supp. 9 (D.D.C. 1993), where the Government

own incentives and abilities excludes the possibility that data and algorithms might soften competition by eliminating competitors. Instead, the focus is on data that are collected and analyzed exclusively by a single firm for exclusive use of that firm to enhance its own products or knowledge about the industry in which it competes. It is meant to comprise technology that mimics the ability of one gasoline retailer to quickly see and react to posted prices of nearby gasoline retailers. It is also meant to comprise technology that mimics the ability of the proprietor of the old general store to know intimately the preferences and personal details of his or her clientele.

## II. SOFTENED OR SHARPENED – WHEN FIRMS COLLECT AND ANALYZE BETTER DATA

Economic theory instructs that competition can be softened or sharpened when firms collect and analyze more comprehensive data on their competitors or their customers. That ambiguity is not so much a weakness of theory, but recognition that effects may be diverse so that a measure of care should be taken to understand the relevant facts in each specific case.

First, consider data about competitors. Firms can analyze those data to gain insight into the fact of what actions competitors have taken as well as what strategies led to those actions. It is impossible to provide an exhaustive discussion of data that firms may collect and analyze. However, it is easy to provide plausible illustrations that show the diversity of effects.

On the one hand, data about competitors can soften competition. *Tacit collusion* is a softening of competition that stems from industry participants' recognition and reaction to the mutual interdependence of their decisions without any explicit agreement. A critical predicate to this recognition is that competitor decisions be visible; a firm cannot react to that which it does not observe. For example, suppose Firm A weighs the benefits of additional sales from a price cut against the prospect that Firm B will respond by cutting prices. By collecting and analyzing data on Firm B's responses, Firm A can better assess Firm B's strategy and can benefit if that strategy supports competition that is not "too vigorous."

On the other hand, data about competitors can sharpen competition. Firms seek out competitive intelligence to identify their own strengths and weaknesses, as well as to identify opportunities and threats of the environment in which they operate. For example, suppose Firm B has recognized and is exploiting a profitable segment of business about which Firm A has no knowledge.<sup>14</sup> While developing and analyzing data on Firm B, Firm A learns about this segment, which it enters; competition in that segment is thereby enhanced. The practice of collecting and analyzing data for competitive intelligence is not new. For example, writing approximately 20 years ago, Larry Kahaner wrote that Mitsubishi's employees collected "more than thirty thousand pieces of business and competitive information *daily*. This data is filtered, analyzed, and disseminated to companies within the Mitsubishi family to be used as ammunition in the ongoing global war against competitors."<sup>15</sup> The possibility that some of that information may have been used to soften competition through explicit agreement with competitors further underlines the ambiguity of this type of data.<sup>16</sup>

When firms analyze data about customers, competition may be similarly either softened or sharpened. Insight into those effects can be appreciated through the economic literature on advertising. And while that literature is vast and nuanced,<sup>17</sup> perhaps a foundational insight of that literature illustrates clearly why analysis of data about customers can strengthen or lessen price com-

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alleged that several large airlines used the Airline Tariff Publishing Company's fare dissemination service to reach agreements on prices.

14 Michael Porter describes firms in the can industry that, when facing aggressive competitors and customers with strong bargaining power, "focus on the segments of the can industry where they can create product differentiation." Porter, Michael E. "How competitive forces shape strategy," *Harvard Business Review* (1979): 137-145.

15 Larry Kahaner, *Competitive intelligence: how to gather analyze and use information to move your business to the top*, Simon and Schuster, 1997, 17.

16 The European Commission found that Mitsubishi Electric, Hitachi and Denso fixed prices for certain automobile parts. The firms "exchanged commercially sensitive information such as price elements and market strategies." European Commission. "Antitrust: Commission fines car parts producers € 137 789 000 in cartel settlement," Press Release, January, 27, 2016, available at: [http://europa.eu/rapid/press-release\\_IP-16-173\\_en.htm](http://europa.eu/rapid/press-release_IP-16-173_en.htm).

17 For a comprehensive review of the relevant literature see Kyle Bagwell, "The economic analysis of advertising." *Handbook of Industrial Organization* 3 (2007): 1701-1844.

petition: advertising may have different effects on price based upon whether it is *persuasive* or *informative*.<sup>18</sup> A persuasive advertisement for a product changes consumer preferences for that product. As a result, demand for the product becomes more inelastic as consumers perceive substitutes to be less perfect substitutes. Ultimately, persuasive advertising can soften competition among competitors and lead to higher prices; it can also be a barrier to entry. In contrast, an informative advertisement does not change preferences, but educates consumers about aspects of a product (e.g. location, price). As a result, demand becomes more elastic as substitute products become prominent in the eyes of consumers. Ultimately, informative advertising can sharpen competition among competitors and lead to lower prices; firms can use informative advertising to support effective entry strategies. Both views of advertising are theoretically plausible and both views have found empirical support: “no single view of advertising is valid in all settings.”<sup>19</sup> When firms analyze customer data to inform marketing programs they do so to make those programs more effective. But because either persuasive or informative advertising programs may benefit from advanced analysis of data, the potential effects on competition can vary.

These illustrations are useful to keep in mind to avoid painting an evolving and complex practice like algorithmic analysis of data with an overly broad brush. It is perhaps instructive to remember how starkly some viewed the implications of commercialization of the internet two decades ago. Some thought that .com companies held immense promise for profitable growth and bid up stock prices. Others predicted that price transparency on the internet would leave no room for profits or innovation.<sup>20</sup> More nuanced views about the implications of the internet for business and competition have arisen since.

### III. UNILATERAL ANALYSIS OF DATA THAT SOFTENS COMPETITION FACES CHALLENGES

The previous section argued against a blanket characterization of the competitive effects of unilateral collection and analysis of competitor and customer data. This section steps away somewhat from the difficulty of distinguishing between those practices that sharpen and those practices that soften competition and asks whether competition authorities should prioritize enforcement against the latter set of practices.

Firms have long collected information on their competitors. The *UK Tractor Registration Exchange* is an example from the mid-1980s where a trade association sought permission from the European competition authority to collect and promulgate detailed information on tractor sales including the producer, brand, serial number, sales agent and information about the buyer.<sup>21</sup> The Commission and Court of First Instance denied the request on the grounds that such information sharing would soften competition. In 1879, the famous Joint Executive Committee (“JEC”) railroad cartel was formed.<sup>22</sup> The JEC, which predated the Sherman Act, was a legal hard-core cartel that collected and published independently verified weekly statistics on the quantities of various commodities shipped by members. It also implemented a number of explicit cartel-enforcement devices such as the use of arbitrators. The result of this action was a significant softening of competition as rates were frequently at monopoly levels.

In both these examples, the information exchanged involved significant collective action by the firms. And while firms have undoubtedly always collected information about their competitors unilaterally, arguably the resulting information did not replicate the rich detail possible with collective action. It may be that advances in information technology will allow for the quality of information collected unilaterally to rival that of information derived from collective action; and to the extent that one exclusively considers examples like the UK tractor exchange or the JEC, this advance will result in softer competition.

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18 Antitrust usually does not distinguish between socially efficient and inefficient competition. Thus, advertising regardless of its effects on price or welfare may be viewed as an important expression of competition.

19 Id. at 1706.

20 Robert Kuttner, “The Net: A Market Too Perfect for Profits,” Bloomberg.com, May 11, 1998, available at: <https://www.bloomberg.com/news/articles/1998-05-10/the-net-a-market-too-perfect-for-profits>.

21 Kai-Uwe Kühn and Xavier Vives, “Information exchanges among firms and their impact on competition,” manuscript, Institut d’Anàlisi Econòmica, Barcelona (1994). Section 3.3.

22 Thomas S. Ulen, “The Market for Regulation: The ICC from 1887 to 1920,” *The American Economic Review* 70, no. 2 (1980): 306-310.

Like the collection of competitive intelligence, firms have long engaged in marketing their products and services to their customers in innovative ways. For example, in the last decades of the 19th century, technological change like electrification enabled firms to exploit significant economies of scale and scope. And to run factories at sustained high levels of throughput necessary to achieve those economies, successful “first mover” firms integrated downstream into marketing to ensure a steady demand for their goods.<sup>23</sup> As the environment continues to change, firms of today and the near future will likely leverage advances in information technology to better target their customers in the pursuit of higher profits. And when marketing efforts that soften competition are the beneficiaries of such innovation, more powerful marketing will result in softer competition.

With that context, the question can now be framed: assuming that a competition authority could identify what analysis of customer or competitor data leads to a softening of competition, should enforcement against those practices be a priority?

The first part of an answer to that question is based on practicality. Simply put, could a court write an order that prohibits the behavior that softens competition?

In the case of unilateral collection and use of data on competitors that facilitates tacit collusion, the answer is that it may be very difficult because such an order would prohibit certain reflections and deliberations within a firm. Contracts (or court orders that proscribe a course of action) must reference observable and verifiable information to be enforceable. And while a facilitating practice like unilateral disclosure of information is observable and verifiable, internal reflections and deliberations are seldom observable and verifiable. As then Judge Breyer wrote, the fact that (at least U.S.) courts do not condemn tacit collusion that softens competition and raises prices “is not because such pricing is desirable (it is not), but because it is close to impossible to devise a judicially enforceable remedy for ‘interdependent’ pricing. How does one order a firm to set its prices without regard to the likely reactions of its competitors?”<sup>24</sup>

In the case of unilateral collection of data on customers, practical concerns also limit what a competition authority might do.<sup>25</sup> Simply put, it is difficult to distinguish marketing that softens competition from marketing that sharpens competition. In theory, a broad proscription on the use of customer data might remove risks. But a broad proscription is also likely to curtail significant innovative and socially valuable applications of the analysis of data.

The second part of an answer to that question depends on what one believes the appropriate role of an antitrust enforcer is. Enforcement actions against a cartel, merger or attempt to monopolize challenge some action believed to extend or preserve market power. Enforcement actions against “excessive pricing” do not require such an action; the challenge is to business practices that are expressions of pre-existing market power. In that context, consider enforcement targeting a firm’s analysis of data that attempts either to differentiate its products in the eyes of consumers or to study the strategies of competitors. Such enforcement could perhaps identify an action (the analysis of data), but unlike a cartel, merger or attempt to monopolize, the action concerns a business practice whose focus is on the firm’s own products or knowledge of the industry. This different focus, however, is the same as many practices firms regularly take when they change the characteristics of their products or revise pricing strategy. In this sense, enforcement against such an analysis of data seems more akin to enforcement against excessive pricing. Whether and when to take action against excessive pricing is controversial in antitrust; that debate has been articulated elsewhere.<sup>26</sup> Suffice it to say, that for some competition authorities, the relevant statutes do not permit any enforcement against excessive pricing.

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23 Alfred D. Chandler, “Organizational Capabilities and the Economic History of the Industrial Enterprise,” *The Journal of Economic Perspectives* 6, no. 3 (1992): 79-100.

24 *Clamp-All Corp. v. Cast Iron Soil Pipe Institute*, 851 F.2d 478 at 484 (1st Cir. 1998).

25 It is perhaps useful to emphasize again that focusing on *unilateral* collection of data precludes collective action. One example of collective action is when a trade association collects data from its members. For example, in an application against the Toronto Real Estate Board (“TREB”), the Canadian Commissioner of Competition alleged that TREB restricted access to data (i.e. its multiple listing service system) to the detriment of competition. The Competition Tribunal concluded that the Commissioner had satisfied the three elements of section 79 of the Competition Act. *Commissioner of Competition v. The Toronto Real Estate Board*, 2016 Comp. Trib. 7 (Competition Trib.).

26 Massimo Motta and Alexandre de Streel, “Excessive Pricing in Competition Law: Never say Never?” *The Pros and Cons of High Prices* 14 (2007).

## IV. CONCLUSION

Firms are using data and algorithms in innovative ways and policy makers are now confronted with new technology whose implications can be ambiguous. But this is hardly the first time that policy makers are confronting such ambiguity. The eminent business historian Alfred Chandler described a second industrial revolution that saw significant increases in industrial concentration and the rise of conglomerates.<sup>27</sup> But that revolution also saw significant decreases in costs due to scale and scope economies. Ultimately, that ambiguity was resolved empirically by the enormous increases in output that resulted: the benefits of the second industrial revolution clearly outweighed the costs. Thus, while it is perhaps natural to regard the uncertain with some suspicion, that suspicion should be tempered by recognizing, as Maureen Ohlhausen has recently noted, that scholarship can be a messy process where many arguments may be made and it takes some time for the good ones to win out.<sup>28</sup> It should also be tempered by the fact that past innovations in technology and business practices have resulted in more benefits than costs.<sup>29</sup> The role of antitrust should begin by recognizing and addressing the benefits and costs associated with new technologies and business practices. Only by explicitly recognizing the benefits, along with the costs, can antitrust strive to maximize the difference between the two.

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<sup>27</sup> Alfred D. Chandler Jr., *The Visible Hand: The Managerial Revolution in American Business*, Harvard University Press, 1977, 20.

<sup>28</sup> Maureen K. Ohlhausen, “Shiny Baubles & Smooth Pebbles: The Role of Pragmatic Skepticism in Competition Law Jurisprudence,” Remarks at the 2017 Concurrences Antitrust Writing Awards, March 28, 2017, available at: <https://www.ftc.gov/public-statements/2017/03/shiny-baubles-smooth-pebbles-role-pragmatic-skepticism-competition-law>.

<sup>29</sup> The current political angst about international trade reminds us, however, that these innovations can be disruptive to individuals and society itself.



# LOOKING UP IN THE DATA-DRIVEN ECONOMY

BY MAURICE E. STUCKE<sup>1</sup> & ARIEL EZRACHI<sup>2</sup>



## I. INTRODUCTION

How competitive is our market economy? Not as much as it ought to be. And the growth of big data threatens to make things even worse. Antitrust regulators already struggle to keep markets competitive. How will they fare in economies increasingly dominated by a few super-platforms?

Before we discuss the e-monopsony and e-scraper problems, it's worth reviewing the state of antitrust policy in the U.S. We are increasingly realizing the market failures and shortcomings of U.S. antitrust policy (aside from cartel enforcement) over the past 35 years. In April 2016, the Obama White House issued an executive order<sup>3</sup> and report<sup>4</sup> on the state of competition in the U.S. The report identified several disturbing signs of competition's decline since the 1970s. Competition appears to be decreasing in many economic sectors, including a decades-long decline in the number of new businesses being started and in the rate at which workers change jobs. At the same time, many industries appear to have become more concentrated, with profits increasingly falling into the hands of fewer firms.

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<sup>3</sup> The White House, Office of the Press Secretary, Executive Order – Steps to Increase Competition and Better Inform Consumers and Workers to Support Continued Growth of the American Economy (April 15, 2016), <https://obamawhitehouse.archives.gov/the-press-office/2016/04/15/executive-order-steps-increase-competition-and-better-inform-consumers>.

<sup>4</sup> Council of Economic Advisers, *Issue Brief: Benefits of Competition and Indicators of Market Power* (April 2016).



These concerns have been noticed by scholars at a recent University of Chicago conference,<sup>5</sup> *The Economist*,<sup>6</sup> *The Atlantic*,<sup>7</sup> antitrust lawyers<sup>8</sup> and the Harvard Business School.<sup>9</sup> The solution is more competition, which traditionally has meant more robust antitrust enforcement. But ensuring competition today means looking at its next frontier: our online e-commerce environment. It means understanding the shift from competition as we know it to the era of big data and big analytics, which is radically changing our markets and competitive ecosystem.

## II. NEITHER GOOD, BAD, NOR NEUTRAL

Big data, sophisticated computer algorithms, and artificial intelligence are not inherently good or bad, but that doesn't mean their effects on society are neutral. Their nature depends on how firms employ them, how markets are structured, and whether firms' incentives are aligned with society's interests. At times, big data and big analytics can promote competition and our welfare by making information more easily available and by providing access to markets.

However, we cannot uncritically assume that we will always benefit. As we explore in our book *Virtual Competition*,<sup>10</sup> big data and big analytics can enable some online sellers to tacitly collude and engage in behavioral discrimination. A third potential anticompetitive scenario involves the dominant "super-platforms."

With the rise of the super-platforms, we tend to look down (on their effect on consumers) rather than up (their effect on sellers and upstream providers). In looking down it seems like Google, Amazon and Facebook are using their power in the marketplace to deliver great value to us — wresting lower prices from producers in the case of Amazon, bringing news onto a single platform in the case of Facebook, and organizing the world's information, in the case of Google.

While these companies appear to be furthering our interests, a closer look reveals how these super-platforms may wield their power downstream to harm us, the consumer. As *Virtual Competition* explores, the super-platforms can use our personal data to better price discriminate and their disincentive to protect our privacy (and promote technologies that do).

Less discussed, but of significant concern, are the upstream effects of these super-platforms. They have the power to harm many of the companies from whom they buy or acquire content — and that harm ultimately harms us. With these digital gatekeepers, the distinction between seller and consumer blurs. Many of us are not only consumers but producers. For example, you may be an author, journalist, musician, photographer or seller on Amazon. Hence the power being brought to bear on the producer — theoretically to benefit the consumer — is actually being brought to bear also on the consumer, as a producer.

In looking up rather down, we see how the super-platforms can squeeze millions of sellers, including photographers, photojournalists, writers, journalists and musicians. These super-platforms can use their significant market power to drive down earnings, while tossing a few pennies from each dollar they take from us back at us. Our competition laws deal with this kind of

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5 *The University of Chicago worries about a lack of competition: Its economists used to champion big firms, but the mood has shifted*, THE ECONOMIST, April 12, 2017, <http://www.economist.com/news/business/21720657-its-economists-used-champion-big-firms-mood-has-shifted-university-chicago?frsc=dg%7Cc>; videos of the panels are available at University of Chicago Booth School of Business, Stigler Center, Is There A Concentration Problem In America? (March 27-29, 2017), <https://research.chicagobooth.edu/stigler/events/single-events/march-27-2017>.

6 *A Giant Problem: The Rise of the Corporate Colossus Threatens Both Competition and the Legitimacy of Business*, THE ECONOMIST, Sept. 17, 2016, <http://www.economist.com/news/leaders/21707210-rise-corporate-colossus-threatens-both-competition-and-legitimacy-business>.

7 Derek Thompson, *America's Monopoly Problem: How big business jammed the wheels of innovation*, THE ATLANTIC, Oct. 2016, <https://www.theatlantic.com/magazine/archive/2016/10/americas-monopoly-problem/497549/>.

8 <http://www.nysba.org/am2017Antitrust/>.

9 Michael E. Porter et al., *Problems Unsolved and A Nation Divided: The State of U.S. Competitiveness 2016*, Harvard Business School, Sept. 2016, <http://www.hbs.edu/competitiveness/Documents/problems-unsolved-and-a-nation-divided.pdf>.

10 ARIEL EZRACHI & MAURICE E. STUCKE, *VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY* (Harvard University Press 2016), <http://www.hup.harvard.edu/catalog.php?isbn=9780674545472>.

buyer power. These concerns, however, are often low on the enforcement agenda due to the indirect effects on “consumer welfare,” which is often measured by the price you pay for the goods or service. So if we stream the YouTube video ostensibly for “free,” the assumption is that our welfare is maximized. In the digital age, that urgently needs to change.

Not only are the upstream sellers poorer. The super-platform’s economic power can translate into political power: As sellers and consumers increasingly rely on these gatekeepers, the super-platforms can shape our political views and the public debate. As the spate of fake news attests, our social fabric and ultimately our welfare are threatened.

### III. E-MONOPSONY

Let us begin with the e-monopsony. Our discussion differs from the textbook monopsony definition. A monopsony typically is characterized as the only or dominant buyer in town. Think of the factory in the one-factory town. As one court noted, “Because the factory is the sole employer—the sole purchaser of labor—it can dictate wages, benefits, and working conditions regardless of how large the town’s population.”<sup>11</sup> Our concern involves the super-platform’s anticompetitive use of power upstream.

Take, for example, publishers who confront a dominant book buyer. In a competitive market, publishers can play bookstores off each other to secure a fair price for their and their writers’ work. The dominant book buyer, on the other hand, depresses the price it pays publishers for the books. It effectively transfers wealth from the publishers and authors to itself. It gets worse for authors who rely on the e-monopsony to publish and distribute their e-books. They must concede to even more onerous demands, such as the e-monopsony paying the author by the actual number of pages that you and I read of that e-book.<sup>12</sup>

Not only is this tracking creepy, it reflects the e-monopsony’s power both upstream and downstream. The e-monopsony depresses the price it pays authors below competitive levels. But these price reductions do not necessarily benefit readers. We pay for the entire e-book; the authors’ royalties are slashed if they can’t hold our attention until the last page; and the e-monopsony pockets the extra profits. Its anticompetitive tactics, instead of promoting economic growth and welfare, can reduce employment, reduce quality and hinder innovation.

It gets worse. An e-monopsony, like a monopoly, can use its trove of personal data to price discriminate both up- and downstream. The e-monopsony, knowing who is reading each author’s work, how far the reader gets and how loyal the reader is, can charge the author’s loyal fans higher prices. Moreover, the e-monopsony can collect personal data on the authors, including their finances (e.g. when college and credit card payments are due). It pays each author only the minimum amount needed for that author to produce the e-book. Authors with a slimmer financial cushion can be more easily exploited; consumers do not necessarily benefit. Indeed, writing-related income of full-time book authors, the Authors Guild found, dropped 30 percent from \$25,000 in 2009 to \$17,500 in 2015. Part-time authors saw their writing income decline 38 percent from \$7,250 to \$4,500.<sup>13</sup>

The EU and U.S. competition laws target these anticompetitive practices, but many competition agencies are not lifting their eyes.

One example is Amazon. The U.S. Department of Justice (“DoJ”), during the Obama administration, heard complaints about how the dominant online retailer was abusing its power.<sup>14</sup> One concern was predatory pricing: Amazon was pricing e-books below cost in order to cement its power, and would eventually seek to reap the rewards by inflating prices and retarding innovation. Another concern was that Amazon retaliated against publishers that tried to take advantage of Apple’s more advanced e-books platform.

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<sup>11</sup> *Sprint Nextel Corp. v. AT & T Inc.*, 821 F. Supp. 2d 308, 324 n. 27 (D.D.C. 2011).

<sup>12</sup> Anita Singh, *Amazon to Pay Kindle Authors Only for Pages Read*, THE TELEGRAPH, June 22, 2015, <http://www.telegraph.co.uk/technology/amazon/11692026/Amazons-to-pay-Kindle-authors-only-for-pages-read.html>.

<sup>13</sup> The Authors Guild, *The Wages of Writing, Key Findings from The Authors Guild 2015 Member Survey*, [https://www.authorsguild.org/wp-content/uploads/2015/09/WagesofWriting\\_Final\\_10-22-15.pdf](https://www.authorsguild.org/wp-content/uploads/2015/09/WagesofWriting_Final_10-22-15.pdf).

<sup>14</sup> *U.S. v. Apple, Inc.*, 889 F. Supp. 2d 623 (S.D.N.Y. 2012).

The Authors Guild pointed out how Amazon often removed the online “buy” buttons for titles from publishers that did not agree to Amazon’s contract terms. Others complained about Amazon’s exclusive distribution agreements with authors. The DoJ responded that the predatory pricing claims were “speculative.”<sup>15</sup> It hailed Barnes & Noble’s entry with its Nook e-reader as shedding any “doubt on the future of e-books agency pricing.”<sup>16</sup> The DoJ never revisited its predictions, as Nook’s sales plunged from \$933 million in 2012 to \$780 million in 2013 to \$506 million in 2014 to \$264 million in 2015 to \$192 million in 2016.<sup>17</sup> Nor did the DoJ investigate after the Authors Guild, the American Booksellers Association, the Association of Authors’ Representatives and Authors United described Amazon’s anticompetitive practices.<sup>18</sup> Nor did the recent report by the Institute for Local Self-Reliance of Amazon’s anticompetitive tactics awake the DoJ from its slumber.<sup>19</sup> Nor did the European Commission’s recent and successful challenge of Amazon’s anticompetitive conditions on publishers.<sup>20</sup>

## IV. E-SCRAPER

Let us now explore the e-scraper. Even if the super-platform is not a buyer, it can distort competition upstream by scraping the viability of upstream providers. Let us illustrate. With its dominant search engine and control of the Android mobile operating system, Google has tremendous power. The U.S. Federal Trade Commission (“FTC”) investigated allegations that Google “unfairly ‘scraped,’ or misappropriated, the content of certain competing websites, passed this content off as its own, and then threatened to delist these rivals entirely from Google’s search results when they protested the misappropriation of their content.”<sup>21</sup> Basically Google was stealing content from other providers operating on its super-platform. Google’s scraping, the FTC Bureau of Competition found, was anticompetitive: “the natural and probable effect of Google’s conduct is to diminish the incentives of [rivals] to invest in, and to develop, new and innovative content, as the companies cannot fully capture the benefits of their innovations.”<sup>22</sup> This theft, the FTC legal staff found after its lengthy investigation, violated the antitrust laws, and should be stopped. Google’s threat “also sent a message to the broader marketplace that Google could, and would, use its monopoly power over search to extract the fruits of its rivals’ innovations.”<sup>23</sup> The FTC Commissioners, however, never sued. Instead, the FTC, in a highly unorthodox move, closed its investigation in early 2013 after Google promised to stop stealing. Then-FTC Chairman Jon Leibowitz and Commissioner Julie Brill,

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15 Id. at 641.

16 Id.

17 Barnes & Noble 2016 Annual Report, [http://files.shareholder.com/downloads/BKS/3973691008x0x900955/6C96EEA0-D250-4C61-8636-BA7AA150E70C/BKS\\_2016\\_Annual\\_Report.PDF](http://files.shareholder.com/downloads/BKS/3973691008x0x900955/6C96EEA0-D250-4C61-8636-BA7AA150E70C/BKS_2016_Annual_Report.PDF).

18 David Streitfeld, *Accusing Amazon of Antitrust Violations, Authors and Booksellers Demand Inquiry*, N.Y. TIMES, July 13, 2015, [https://www.nytimes.com/2015/07/14/technology/accusing-amazon-of-antitrust-violations-authors-and-booksellers-demand-us-inquiry.html?\\_r=0](https://www.nytimes.com/2015/07/14/technology/accusing-amazon-of-antitrust-violations-authors-and-booksellers-demand-us-inquiry.html?_r=0).

19 OLIVIA LAVECCHIA AND STACY MITCHELL, *HOW AMAZON’S TIGHTENING GRIP ON THE ECONOMY IS STIFLING COMPETITION, ERODING JOBS, AND THREATENING COMMUNITIES* (Institute for Local Self-Reliance Nov. 2016), [https://ilsr.org/wp-content/uploads/2016/11/ILSR\\_AmazonReport\\_final.pdf](https://ilsr.org/wp-content/uploads/2016/11/ILSR_AmazonReport_final.pdf).

20 European Commission - Press release, *Antitrust: Commission seeks feedback on commitments offered by Amazon in e-book investigation*, Brussels, Jan. 24, 2017, [http://europa.eu/rapid/press-release\\_IP-17-137\\_en.htm](http://europa.eu/rapid/press-release_IP-17-137_en.htm).

21 Statement of the Federal Trade Commission Regarding Google’s Search Practices, *In the Matter of Google Inc.*, FTC File Number 111-0163 (Jan. 3, 2013), [https://www.ftc.gov/system/files/documents/public\\_statements/295971/130103googlesearchstmttoftcomm.pdf](https://www.ftc.gov/system/files/documents/public_statements/295971/130103googlesearchstmttoftcomm.pdf) [hereinafter *FTC Google Statement*].

22 Federal Trade Commission Bureau of Competition, Report re Google Inc., Aug. 8, 2012, <http://graphics.wsj.com/google-ftc-report>. A few caveats about this report, which the FTC released (mistakenly) under the Freedom of Information Act to the *Wall Street Journal*. First, only the Report’s even pages were released, so the missing odd pages may have contained important qualifications. Second, other reports, including any prepared by Google, were not released. Third, although the Competition Staff recommended that the FTC sue Google, the Commissioners elected not to. Google responded to the Report’s disclosure:

We understand that what was sent to the Wall Street Journal represents 50% of one document written by 50% of the FTC case teams. Ultimately both case teams (100%) concluded that no action was needed on search display and ranking. Speculation about consumer or competitor harm turned out to be entirely wrong. On the other issues raised, we quickly made changes as agreed with the FTC.

The FTC Report on Google’s Business Practices, WALL STREET JOURNAL, March 24, 2015, <http://graphics.wsj.com/google-ftc-report/>.

23 Id.

in a press release, expected the FTC “to enforce vigorously” Google’s voluntary commitment not to scrape.<sup>24</sup> Both have left the FTC. Google reportedly continues to scrape. As one complainant, Getty Images, notes, “Artists need to earn a living in order to sustain creativity and licensing is paramount to this; however, this cannot happen if Google is siphoning traffic and creating an environment where it can claim the profits from individuals’ creations as its own.”<sup>25</sup> Neither the FTC nor DoJ, during the Obama administration, stopped Google. So American firms have turned to the European Commission, which is currently investigating Google for scraping.<sup>26</sup>

The e-monopsony and e-scraping concerns are not conjectural. Most Americans, despite the gains in productivity, have experienced stagnant wages. The Council of Economic Advisers identifies monopsony power, rising concentration and monopoly pricing as hindering the U.S. economy.<sup>27</sup>

The concerns go beyond our wallet and can threaten our democratic ideals. The super-platforms are now an indispensable distribution channel for the news and books we read, the entertainment we watch and the music we listen. The super-platforms — in directing our views of the world — can influence the marketplace of ideas and our elections. Jonathan Zittrain, for example, identified as a risk Facebook’s ability to manipulate elections.<sup>28</sup> He warned of the super-platform’s potential ability to predict political views, identify party affiliation and engage in targeted campaigning to mobilize distinct groups of voters to take action. Robert Epstein likewise argued how Google, in manipulating the rankings of its search results, “can easily shift the voting preferences of undecided voters by 20 percent or more—up to 80 percent in some demographic groups—with virtually no one knowing they are being manipulated.”<sup>29</sup> We have already seen instances in which super-platforms promoted certain corporate agendas. Google, for example, used its homepage to protest against the Stop Online Piracy Act (“SOPA”), asking users to petition Congress.

As worldwide web inventor Tim Berners-Lee noted:

Today, most people find news and information on the web through just a handful of social media sites and search engines. These sites make more money when we click on the links they show us. And, they choose what to show us based on algorithms which learn from our personal data that they are constantly harvesting. The net result is that these sites show us content they think we’ll click on — meaning that misinformation, or ‘fake news’, which is surprising, shocking, or designed to appeal to our biases can spread like wildfire. And through the use of data science and armies of bots, those with bad intentions can game the system to spread misinformation for financial or political gain.<sup>30</sup>

One criticism is that the super-platforms shirk the legal and business responsibilities that the traditional media accept, such as responsibility for editorial opinion, paying the cost of investigative journalism and photojournalism, presenting both sides to a story, paying for content creation and liability for defamation. As a result, the tech companies operate in something of a “lawless zone” where they benefit from the ambiguity of their role. Thus, in dispensing with both journalists and editors, scraping others’ content, not fairly compensating content providers and reinforcing the “filter bubble” effect, the super-platforms — rather than promoting the marketplace of ideas — can actually hinder it.

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24 FTC Google Statement, *supra* note 21.

25 Samuel Gibbs, *Getty Images Files Antitrust Complaint Against Google*, THE GUARDIAN, April 27, 2016, <https://www.theguardian.com/technology/2016/apr/27/getty-images-files-antitrust-google>.

26 European Commission - Press release, Antitrust: Commission sends Statement of Objections to Google on comparison shopping service; opens separate formal investigation on Android, Brussels, April 15, 2015, [http://europa.eu/rapid/press-release\\_IP-15-4780\\_en.htm](http://europa.eu/rapid/press-release_IP-15-4780_en.htm).

27 Council of Economic Advisers, Issue Brief: Labor Market Monopsony: Trends, Consequences, and Policy Responses (Oct. 2016).

28 Jonathan Zittrain, *Facebook Could Decide an Election Without Anyone Ever Finding Out, The scary future of digital gerrymandering—and how to prevent it*, NEW REPUBLIC, June 1, 2014, <https://newrepublic.com/article/117878/information-fiduciary-solution-facebook-digital-gerrymandering>.

29 Robert Epstein, *How Google Could Rig the 2016 Election: Google has the ability to drive millions of votes to a candidate with no one the wiser*, POLITICO, Aug. 19, 2015, <http://www.politico.com/magazine/story/2015/08/how-google-could-rig-the-2016-election-121548>.

30 *Three Challenges for The Web, According to Its Inventor*, Web Foundation, March 12, 2017, <http://webfoundation.org/2017/03/web-turns-28-letter/>.

## V. CONCLUSION

Ultimately, the super-platforms – in harming both the content providers upstream and consumers downstream – can undermine our economic well-being and democracy. Competition law has at its origins the protection of society from the misuse of economic and political power. Thus, our competition authorities must step up. Failing to challenge a super-platform’s anticompetitive practices will only embolden it (and other aspiring gatekeepers). When the enforcer only looks down, upstream competition, innovation and the livelihood of many market participants, who deserve a competitive marketplace, will be hindered.

So if our politicians really care about our welfare, they should tell enforcers to start looking up. Doing so will help tackle America’s concentration problem and help develop an inclusive data-driven economy that benefits more than one percent of the population. Looking up will also help promote a healthy democracy.



# ALGORITHMIC-FACILITATED COORDINATION: MARKET AND LEGAL SOLUTIONS

BY MICHAL S. GAL<sup>1</sup>



## I. INTRODUCTION

Technological developments, it was hoped, would bring about more competition. The ability to connect faster and more easily with numerous suppliers on-line through digital platforms, as well as the use of algorithms by consumers in order to compare more offers in a more efficient and sophisticated manner, strengthened pressures on suppliers to provide better and cheaper products and services.<sup>2</sup> These advantages, however, are currently threatened by algorithmic-facilitated coordination.<sup>3</sup>

Algorithms make coordination – both implicit or tacit – much easier and quicker than ever before. Such coordination may bring about many positive effects. For example, they enable suppliers to better coordinate their conduct with the demands of consumers, thereby saving scarce resources, and responding much faster to demand trends. At the same time, and based on similar technological abilities, algorithms ease coordination among competing suppliers. Indeed, coordination no longer requires firms to operate in oligopolistic markets; and firms can more quickly and easily detect and punish deviations from the status-quo, thereby reducing incentives for shirking. As our assumptions about which market conditions must exist for firms to coordinate are altered, the number of red flags that are raised across industries rises. As Ezrachi and Stucke write, this is the end of competition as we know it.<sup>4</sup>

This requires us to explore which tools – either market-based or regulatory – can be used, if at all, in order to reduce the negative welfare effects of algorithmic coordination among competitors. Given that some of the assumptions that stand at the basis of the current rule under which tacit

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<sup>2</sup> Michal S. Gal and Niva Elkin-Koren, “Algorithmic Consumers,” *Harvard Journal of Law and Technology*, (2017).

<sup>3</sup> Ariel Ezrachi and Maurice Stucke, *Virtual Competition* (Harvard University Press, 2016).

<sup>4</sup> *Id.*

collusion is not considered an “agreement in restraint of trade” do not hold anymore, it is time to determine whether our laws are fit to deal with the digitized world; whether we are looking under the lamp while most of the occurrence in the real world is happening outside its scope of light. In other words, can we widen the scope of the light by simply using a stronger light bulb in the same lamp, or do we need to create a new source of light altogether?

Accordingly, this short note focuses on three issues that arise from this technological challenge. First, it explores the effects of algorithms on the ability of suppliers to coordinate their conduct. Second, it explores the ability of existing technological and regulatory tools to deal effectively with algorithmic-facilitated coordination. The final part briefly explores the promises as well as the limits of market solutions to welfare-reducing algorithmic coordination, which can be complementary or provide at least some viable alternative for the possible failure of regulation to deal with algorithmic-facilitated coordination. Issues of vertical integration and coordination, while important, are not addressed in this note.

## II. ALGORITHMS AS FACILITATORS OF COORDINATION

### A. *The Economic Theory at the Basis of Coordination*

Competitors have an inherent motivation to coordinate their conduct instead of competing among themselves. Such conduct can significantly increase their welfare and reduce consumers’ welfare accordingly. Nobel Laureate economist George Stigler identified three conditions that must exist for such coordination to take place. In this part we briefly explore how meeting these three conditions has become much easier due to the use of a digital hand in market transactions.

Stigler recognized three cumulative conditions that must exist for a supra-competitive equilibrium to be created in the market, which still serve as a basis for much of the economic literature on coordination.<sup>5</sup> These conditions must hold whether coordination is a result of an explicit agreement, or whether it is the result of tacit collusion:

1. *Reaching an understanding* on trade conditions (price, quantity, quality, etc.) which are profitable to all parties to the understanding. This involves resolution of any disagreement between firms as to the “correct” trade terms, and communication of the ultimate decision to all parties. Otherwise, market participants will not be able to create a stable status-quo that is perceived to benefit each and every one of them relative to a situation in which they do not coordinate, and competition will ensue;
2. *Detection of deviations* from the status-quo of other firms. The slower and less completely deviations are detected, the weaker the coordination, as firms have stronger incentives to cheat. Also, if market conditions are not conducive to exposing deviations, firms would have to incur substantial costs to detect deviations, which reduce the overall attractiveness of coordination in the first place;
3. Creating a *credible threat of retaliation* against deviators, in order to discourage such deviations in the first place.

Economic theory further recognizes a fourth condition which must exist for coordination to take place:

4. *High entry barriers* in the market in which the competitors operate, as otherwise new competitors might easily enter and sweep away the high profits, thereby reducing incentives to set supra-competitive prices in the first place.

The economic literature identifies additional market conditions which help facilitate coordination. Facilitating factors can be grouped into four broad categories: market structure variables (market concentration, entry barriers), the nature of the product (product and cost homogeneity, multiplicity of product variables), the nature of sales (lumpiness and secrecy), and the “personality” of

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<sup>5</sup> George J. Stigler, “Theory of Oligopoly,” 72 *Journal of Political Economy* 44 (1964).

the firms operating in the market.<sup>6</sup> The relevant factors may vary within a market over time and some of them, such as entrepreneurial attitudes towards the engagement in illegal activity, are intrinsically variable. None of the factors are deterministic in their ability to facilitate coordination. Rather, they all reflect general tendencies subject to random deviations. In reality, a combination of market conditions will determine the likelihood of coordination. Some major examples are noted below.<sup>7</sup>

A major structural condition which facilitates coordination is a small number of competitors, i.e. a concentrated market structure. This condition eases all three of Stigler's conditions. Most importantly, reaching an understanding to limit competition is easier and less costly if the number of firms is small; and the detection of chiseling is easier, given that there is a lower number of firms that should be checked for deviating conduct.

Indeed, the number of firms is so important, that it is largely assumed that tacit collusion can only be reached in oligopoly markets (hence its alternative name, "oligopolistic coordination"). Oligopoly means few sellers. The main economic characteristic of oligopolistic markets is that each firm's decisions have a noticeable impact on the market and on its rivals. Though each firm may independently decide its strategic moves, any rational decision must take into account the anticipated reaction of its rival firms to its decisions. As Shapiro states, "the hallmark of oligopoly is the presence of strategic interactions among rival firms."<sup>8</sup> An oligopolist's decisions may thus be interdependent though arrived at independently. Such mutual interdependence may forestall rivalrous conduct.

Transparency of transactions also makes it easier to coordinate, since market offers are easier to coordinate, and deviations are easier to detect.

## ***B. Algorithms as Coordination Facilitators***

Algorithms operating in the data economy make meeting the conditions for coordinated conduct much easier than ever before.<sup>9</sup>

Reaching an understanding can be much easier for several reasons. The availability of real-time information on other competitors' digital offers, as well as on consumers' preferences, facilitated by technological advances in data collection and data analytics, make it easier than ever to calculate the joint profit-maximizing level. The availability of real-time data also makes it easier to detect and adjust to market changes (such as an increase in the price of a major input of production), thereby shortening the reaction time to changes in market conditions and creating a new status-quo. Of no less importance, algorithms can more quickly and accurately calculate the joint profit-maximizing level among many competitors, thereby overcoming the condition that the market be oligopolistic. Also, the algorithm makes an economic, rational decision, devoid of ego, unless the coder of the algorithm decides otherwise.

Detection of deviations from the status-quo is also made much easier in a world in which data on offers is available online.

Creating a credible threat of retaliation against deviators is also facilitated by algorithms, as they can be coded to react immediately to such deviations. Competitors, acknowledging this fact, have lower incentives to deviate in the first place. Also, algorithms can calculate the risk of being caught and the correct height of sanction to ensure nobody deviates. Also, they may create a higher risk of policing deviations, especially if changing the algorithm's decision tree is not simple (e.g. if it has to go back to the coder). This may make the status-quo more stable.

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6 Michal S. Gal, *Competition Policy in Small Market Economies* (Harvard University Press, 2003), chapter 5.

7 See, e.g. Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright & Jean Tirole, *The Economics of Tacit Collusion*, FINAL REPORT FOR DG COMPETITION, EC (2003) [http://ec.europa.eu/competition/mergers/studies\\_reports/the\\_economics\\_of\\_tacit\\_collusion\\_en.pdf](http://ec.europa.eu/competition/mergers/studies_reports/the_economics_of_tacit_collusion_en.pdf); Sigrid Stroux, US and EC Oligopoly Control (2004); Patrick Rey, "Collective Dominance and the Telecommunication Industry," in *The Economics of Antitrust and Regulation in Telecommunication Markets* (Pierre A. Buigues and Patrick Rey eds., 2004), 91, 91–102.

8 Carl Shapiro, "Theories of Oligopoly Behavior," in *Handbook of Industrial Organization*, R. Schmalensee and R. Willig eds., Vol. I (Amsterdam: Elsevier Science Publishers, 1989), 329.

9 Salil K. Mehra, *Antitrust and the Robo-Seller Competition in the Time of Algorithms*, 100 MINNESOTA LAW REVIEW 1323 (2016).



Interestingly, algorithms also affect entry decisions. Assume that a potential entrant observes that high prices are charged in a certain market with relatively low entry barriers. Its incentives to enter the market are, however, dependent on the profits to be had in the post-entry period. If the algorithmic response to a lower price will be immediate, incentives for new entry will be reduced.

One conclusion from the above is that more transparency in online offers, and in competitors' algorithmic models, while also potentially benefitting consumers, also sustains and strengthens coordination. Indeed, applications for finding cheap gasoline in one's area in fact drove prices to be higher, since each competitor could see in real time when others were changing their price and act accordingly.

Another conclusion is that due to these more efficient ways of fulfilling Stigler's three conditions, coordination can be reached even if the algorithmic market is comprised of many small algorithms, all coded to monitor and police deviations. Indeed, the negligible costs of communicating and processing information make coordination and integration cost-effective in a way that was not available before, enabling large-scale coordination.

So far we have assumed that competitors set similar although supra-competitive trade terms to consumers, so that consumers have no real choice among competitors. But in the digital world another factor comes into play: information about each and every consumer's elasticity of demand. As more information is gathered about each consumer's preferences, a consumer's "digital profile" can be used by suppliers to increase their profits even further, if they can price-differentiate between the offers they make to different consumers. This, in turn, implies that setting one price for the whole market is welfare-reducing for suppliers and that more factors enter into the coordinated equilibrium, thereby making coordination more complicated.<sup>10</sup>

How is coordination affected by this tendency? Much depends on the type of coordination reached between algorithms and on the information each firm has about consumer preferences. Should firms not share such information, they would have a tendency to reach a market-division agreement, in which each does not enter the market segment of the other, and each can exploit information regarding consumer preferences in its designated market, and even engage in perfect price discrimination. Another possibility is that firms share such information, whether because it is easily calculated by each of them alone, or because they all refer to a common database and use similar data analytical tools. If so, they can coordinate with regard to the price charged from each and every consumer, rather than in the market as a whole. While such coordination would be almost impossible for humans, it can be facilitated by algorithms.

### ***C. Algorithms Increase Harm to Welfare***

The effects of algorithms as coordination-facilitators increases the harms of coordinated conduct among potential competitors. Indeed, in the data-driven economy, these harms are more significant than ever before.

To understand the size of this threat, take as a baseline the current harm created by cartels.<sup>11</sup> By assisting competitors to overcome what was assumed to be the inherent limitations of coordination, algorithms strengthen both the ability to reach as well as the duration of coordinated conduct. Accordingly, the potential for harm is much larger. Indeed, the threat is so important that the OECD, as well as other international bodies, have recently put it on their agenda. Should this technological change not be recognized and dealt with, its effects on our marketplace and on our social fabric might well be significant.

Let me offer a final observation: if many markets are coordinated, and firms can indeed price-discriminate, this might reduce the incentives of consumers to work and earn more, thereby completely changing the dynamics in the market.

So how do we ensure that consumers enjoy the benefits of the data-driven digital economy? The next two parts briefly explore two potential solutions: market-based ones, and competition law ones.

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<sup>10</sup> See also Nicolas Petit, "Antitrust and Artificial Intelligence: A Research Agenda," *JECLAP* (2017).

<sup>11</sup> See, e.g. John M. Connor and Robert H. Lande, *Cartels as Rational Business Strategy: Crime Pays* 34 *CARDOZO LAW REVIEW* 427 (2012).

### III. MARKET-BASED SOLUTIONS?

Can the market devise its own solutions to algorithmic coordination? The answer is a partial yes. As shown by Gal and Elkin-Koren, the use of algorithms by consumers can counteract at least some of the increased market power of suppliers.<sup>12</sup>

Algorithmic consumers (“digital butlers”) are algorithms that are employed by consumers, which make and execute decisions for the consumer by directly communicating with other systems through the Internet. The algorithm automatically identifies a need, searches for an optimal purchase, and executes the transaction on behalf of the consumer. As elaborated elsewhere,<sup>13</sup> algorithmic consumers offer many benefits to consumers as they can significantly reduce search and transaction costs, and help consumers overcome biases and enable more rational and sophisticated choices.

Most importantly for our purposes, they can counteract at least some of the negative welfare effects of algorithms used by suppliers, creating algorithmic wars. How can they do so? Algorithmic consumers can create buyer power, if an algorithmic consumer has a sufficiently large number of users, or if it coordinates its conduct with other algorithmic consumers. This, in turn, may allow consumers to counteract suppliers’ buyer power. Indeed, the algorithm can be coded not to buy a certain good if price is above a certain level. The aggregation of buyers can also make transactions less frequent and small, thereby increasing incentives of suppliers to deviate from the status-quo.

Furthermore, algorithmic consumers can be coded to include decisional parameters designed to eliminate or at least reduce some market failures in the long run. Algorithms are sufficiently flexible to include considerations such as long-run effects on market structures that might harm consumers. For example, an algorithm might be able to recognize the coordination, and refrain from doing business with those suppliers until prices are lowered. Or it might always buy some portion of its goods from at least one new source, to strengthen incentives for new suppliers to enter the market. Of course, including such decisional parameters requires more sophisticated modeling and analysis of market conditions and their effect on welfare, but given advances in economics and in data science, they are becoming easier.

Finally, Algorithmic buying groups may reduce the ability of suppliers to learn about, or to use to their advantage, information regarding each user’s preferences by aggregating the choices of different consumers into one virtual buyer (what might be called anonymization-through-aggregation). Indeed, once consumers are aggregated into sufficiently large consumer groups, suppliers will lose the ability to collect information on consumers’ individual preferences with regard to products bought through the group, and to discriminate among them based on each consumer’s elasticity of demand.<sup>14</sup> For instance, a seller might price discriminate by charging a law professor more for the same law book than a student, given that the former generally has greater financial means with which to buy law books. The loss of this ability, in turn, could increase consumers’ welfare, if suppliers are forced to set a lower price for all. However, in some situations it might also affect welfare negatively, by limiting the ability of some flexible-demand consumers to enjoy lower prices, or by limiting consumers’ exposure to personalized offers.

Algorithmic consumers can therefore improve market dynamics and limit coordination without need of legal intervention. Rather, its regulating power resides in the reaction of consumers to the change in market conditions created by suppliers through their algorithms. It is sufficiently wide to capture tacit coordination.

This market-based solution is not, however, without limitations. One limitation may be regulatory: the use of algorithmic consumers might infringe competition laws, should they be considered to engage in anti-competitive agreements or to abuse their

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<sup>12</sup> Gal and Elkin-Koren, *supra*.

<sup>13</sup> *Id.*

<sup>14</sup> See, e.g. Samuel B. Hwang & Sungho Kim, *Dynamic Pricing Algorithm for E-Commerce*, in *ADVANCES IN SYSTEMS, COMPUTING SCIENCES AND SOFTWARE ENGINEERING* 149 (Tarek Sobh & Khaled Elleithy eds., 2006). For a discussion of the welfare effects of price discrimination, see, e.g. R. Preston McAfee, *Price Discrimination*, in *ISSUES IN COMPETITION LAW AND POLICY* 465, 480–83 (ABA Section of Antitrust Law 2008).

market power. Another concern is that the market for algorithmic consumers will be dominated by digital butlers who are not benign, but rather serve their suppliers' purposes (such as Amazon's Alexa).

Finally, another potential market solution, that may enable suppliers to reduce prices, is to make offers directly to consumers, and not through a digital medium. This, in turn, might reduce – although not completely eliminate- the ability of other algorithms to learn about such transactions, thereby reducing detection of shirking.

#### **IV. LEGAL SOLUTIONS: IS COMPETITION LAW WORKING FOR US?**

“Smart coordination” by suppliers requires “smart regulation.” The question is whether competition law is up to the task. Indeed, current legal tools were designed to deal with human facilitation of parallel conduct. New ways to coordinate, as well as the potential scale and scope of the resulting parallel conduct, were not envisioned at the time when competition law prohibitions were fashioned.

The main problem in applying competition law prohibitions is that for liability to arise from coordinated conduct, an “agreement” must be found to exist among those engaged in the anti-competitive conduct. Undoubtedly, some types of coordination among algorithmic consumers satisfy this condition. A relatively simple scenario involves the use of algorithms to implement, monitor, police or strengthen an anti-competitive agreement among users or providers of algorithms. In such a situation a clear agreement exists.<sup>15</sup>

A more complicated scenario involves tacit collusion among algorithms, reached without the need for a preliminary agreement among them. Rather, a stable status quo is achieved when each algorithm is coded to make its decisions based on its predictions of the best responses and dominant strategies of other parties in the market. This leads to coordination without prior agreement, which could be facilitated automatically. In another scenario, the algorithms are designed to achieve a given target, such as price reduction. The algorithms determine independently the means to reach that target, through self-learning and feedback collected from the market. Therefore, coordination is not the fruit of explicit human design but rather the outcome of evolution, self-learning and independent machine execution. Ezrachi and Stucke argue that parallel conduct that results from the last two scenarios does not constitute an “agreement” for the purpose of competition law and therefore is not prohibited.<sup>16</sup>

Gal and Elkin-Koren offer a different view.<sup>17</sup> One of the exceptions to the rule that exempts tacit collusion from competition law liability is the existence of “plus factors.”<sup>18</sup> These are positive actions, engaged in by market players, which depart from the market's natural conditions and allow firms to better achieve coordination. In both cases it can be argued that the algorithm, or rather its design, constitutes a plus factor. Algorithms include in their decision trees elements that not only scan and compare the available options as a basis for consumption decisions, but also change suppliers' decision parameters to include reactions to offers made by suppliers to other consumers, thereby also changing suppliers' incentives. Arguably, therefore, the algorithm constitutes a plus factor to an agreement among the operators of such algorithms, and possibly also among their users.

Observe that to apply such rules in practice, competition authorities might need to strengthen their technological expertise, by either creating an internal “algorithmic police” or by employing outside talent to detect algorithmic conduct that constitutes a plus factor. Also observe that the regulatory net should not be cast too widely, as otherwise we might prohibit conduct which is welfare-enhancing. Therefore we need to devise “reasonableness tests” that are based on understanding on how algorithms work in the digital environment, while exploring the quality of the data and its analysis which serve as inputs into the algorithm, the model used to make the decision, the way the decision is communicated in the market, and the anticipated reaction to this decision by other market players. Indeed, while some algorithms can be treated as “coordination by design,” a paraphrase on “privacy by design” which is an approach to systems engineering which takes privacy into account throughout the whole engineering process, others may only

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<sup>15</sup> For four main scenarios, see Ezrachi and Stucke, *supra*.

<sup>16</sup> *Ibid*.

<sup>17</sup> Gal and Elkin-Koren, *supra*.

<sup>18</sup> See, e.g. William E Kovacic, Robert C. Marshall, Leslie M. Marx, & Halbert L. White, *Plus Factors and Agreement in Antitrust Law*, 110 MICH. L. REV. 393 (2011).

inadvertently facilitate coordination. These issues are explored in detail by Gal and Petit.<sup>19</sup>

Alternatively, legislators and courts might need to reevaluate the current policy of exempting tacit collusion from the prohibition against anti-competitive agreements. This is because some of the factors underlying the decision not to regulate tacit coordination—principally that such coordination affects only a small number of markets—may no longer be true. Indeed, this justification was based on assumptions of limited human capacity that no longer hold. Once we introduce algorithms, not only does oligopolistic coordination become more durable, but it may also actually be facilitated in non-oligopolistic markets, in which many competitors operate. Moreover, detection and reaction are almost immediate. The requirement that a prior agreement exist among market players therefore does not fit the algorithmic world. The major problem with limiting tacit coordination by algorithms is similar to the one raised by Donald Turner with regard to non-algorithmic-enhanced oligopolistic coordination: how should the remedy be structured?<sup>20</sup> Should the algorithm be mandated to ignore its competitors' potential moves? Such a requirement may well undermine competition. Therefore, the issue of remedy should be well thought through before the law is changed.

Another regulatory issue involves the level of transparency and explainability which is legally required from coders of algorithms. Transparency enables consumers and regulators to detect coordination as well as other types of conduct such as discrimination. Yet even if we create user or regulatory literacy of algorithmic decision-making, the issue still remains what exactly is prohibited. Furthermore, transparency can help facilitate coordination by exposing the considerations that one's rivals take into account, including the weight given to different parameters. Finally, the benefits of transparency and explainability fall short when the algorithm employs machine learning based on neural networks, that is, it teaches itself the best way to behave in the market even if the coder did not model such conduct.

A final challenge is that regulatory tools, while taking into account competition-related considerations, should not disregard other factors which affect welfare such as privacy, right to identity, the protection of business secrets in order to ensure incentives to innovate, and cyber security.

## V. CONCLUSION

The brave new world in which algorithms make many decisions challenges some of our most basic assumptions about how markets operate. Indeed, as shown, algorithms make coordination easier and quicker than ever, thereby reducing incentives to compete. This, in turn, increases the importance of market or legal reactions to reduce potential welfare-reducing effects, while ensuring that the consumer can enjoy the benefits that the digital world offers. This short note attempted to briefly explore some of the basic challenges to competition which are created by algorithms used by suppliers, as well as some potential market-based and legal counter-measures.

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<sup>19</sup> Gal and Petit, *Algorithms as Plus Factors*, forthcoming.

<sup>20</sup> Donald F. Turner, *The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal*, 75 HARV. L. REV. 655 (1962).

# ALGORITHMS, ARTIFICIAL INTELLIGENCE, AND JOINT CONDUCT

BY DYLAN I. BALLARD & AMAR S. NAIK<sup>1</sup>



## I. INTRODUCTION

The ability of algorithms and artificial intelligence to monitor and set prices is increasing in sophistication, effectiveness and independence from human involvement at an exponential rate. The growth in this area, which is seen simultaneously across a range of AI applications, is such that no one — even its creators — is likely to fully appreciate AI’s capabilities until sometime after they have been realized. Pricing “bots” are already capable of engaging in behavior that we would not hesitate to call “parallel conduct” if it were performed by humans, and they will only get better at it. Indeed, the day may not be so far off when the pricing bot of one firm is fully capable of *colluding* — in every meaningful sense — with the pricing bot of a competing firm. At that point, we may have “conspiracy” cases under Section 1 of the Sherman Act that look very much like the cases we have today, except that the parts now played by humans are played by robots.<sup>2</sup>

The few existing antitrust cases involving pricing algorithms have not crossed this Rubicon, or really even approached it. They do not involve joint conduct *by bots*, in any sense. Instead, these cases involve human beings reaching familiar price-fixing agreements and then implementing them algorithmically. While these cases may create special problems of detection and proof, at least for the moment they do not seem to require any shift in the conceptual apparatus we use to solve antitrust problems.

There is reason to think such a shift may be coming, however. Joint conduct by robots is likely to be *different* — harder to detect, more effective, more stable and persistent — than traditional joint conduct by humans. For example, one of the basic precepts of the Sherman Act is that “unilateral” conduct by firms in the same market is not unlawful under Section 1, even if

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<sup>2</sup> Section 1 of the Sherman Act provides: “Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal.” 15 U.S.C. § 1.

the conduct is closely interdependent and predictably yields supracompetitive prices that would be *per se* unlawful if achieved by agreement. An unspoken premise of this time-honored rule is that such interdependent conduct is likely to be relatively unstable in the absence of an agreement, and therefore, with any luck, the supracompetitive effects generally will be shorter lived and less pernicious than if they were achieved through true joint conduct.

But this premise may have less force in a world of bots, who can interpret and respond to the actions of their competitors with far more precision, agility and consistency than their human counterparts. By simply allowing these bots to go to work, it is easy to imagine an effectively permanent pricing stasis settling over many markets, and not always with procompetitive effects.

How will enforcers approach such conduct, much less disrupt or prevent it? What duties should we impose on human beings to ensure their bots behave, and what culpability should they have when their bots go astray? The next ten years will begin to provide the answers, but the technology is already well ahead of the law, and the growing pains are likely to be immense.

## II. BACKGROUND

A few months before the Sherman Act passed Congress on July 2, 1890, the U.S. Census Bureau started using Herman Hollerith's electrochemical punched card tabulator machines to record census returns. This invention allowed the Census Bureau to collect much larger volumes of data and reduced the amount of time to process census results. Hollerith's invention laid the groundwork for automated data processing, and he later partnered up with other inventors to form the technology company that ultimately became IBM.

Over time, engineers, inventors and entrepreneurs developed more advanced versions of Hollerith's data machines and implemented them in the marketplace. In the early 1970s, Thomas Peterffy and Dr. Henry Jarecki pioneered the use of computer algorithms that weighed various factors relating to option pricing. Their "black boxes" would "inhale market data, chew on it, then issue an instruction to their user, in this case whether to buy or sell."<sup>3</sup> Their use of algorithmic pricing gave them an edge in the commodities markets because their computers would be able to process data inputs, weigh each factor and make trading recommendations more adeptly than their human counterparts.<sup>4</sup>

Today, modern innovations include more advanced algorithms, adaptive technologies and artificial intelligences (e.g. IBM's Watson, Microsoft's Oxford, Google's DeepMind and Baidu's Minwa). These technologies can pore over vast amounts of data before recommending or making strategic decisions.<sup>5</sup> Like the simpler machines of the past, the newer machines can use data processing and analytics to give companies an edge in the marketplace when it comes to production, pricing and other business operations.

While the application of technology to determine purchasing and pricing patterns is nothing new, the increased sophistication of such technologies and their potential to play a role in unlawful conduct has caught the attention of global antitrust and competition enforcers. In a speech given on March 16, 2017, Commissioner Margrethe Vestager discussed how the use of algorithms could infringe EU competition law.<sup>6</sup> She commented that "[p]ricing algorithms need to be built in a way that doesn't allow them to collude" and that "companies can't escape responsibility for collusion by hiding behind a computer program."<sup>7</sup>

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3 CHRISTOPHER STEINER, *AUTOMATE THIS: HOW ALGORITHMS TOOK OVER OUR MARKETS, OUR JOBS, AND THE WORLD* (2012).

4 Just a few years after Peterffy and Jarecki's innovation, Professors Fischer Black and Myron Scholes of the University of Chicago published a paper that included what became widely known as the Black-Scholes formula for option pricing. Algorithms based on the Black-Scholes formula would "reshape Wall Street and bring a flock of like-minded men—mathematicians and engineers—to the front lines of the financial world." *Id.*

5 Artificial intelligence has already showcased its potential with its ability to make medical diagnoses, prepare legal briefs and conduct other traditionally human behavior.

6 Matthew Levitt et al., *EU Antitrust Enforcement 2.0 – European Commission Raises Concerns About Algorithms And Encourages Individual Whistleblowers*, KLUWER COMPETITION LAW BLOG (Mar. 21, 2017), available at: <http://klowercompetitionlawblog.com/2017/03/21/eu-antitrust-enforcement-2-0-european-commission-raises-concerns-about-algorithms-and-encourages-individual-whistleblowers/>.

7 *Id.*

Perhaps more notably, the U.S. Department of Justice (“DoJ”) has already indicted two individuals for their use of the same pricing algorithms in the online poster marketplace.<sup>8</sup> At the time of these indictments, many commentators noted that these cases could start a new trend for price-fixing cases. But once the dust settled, it became apparent that DoJ’s cases did not reveal a new species of a Section 1 conspiracy. After all, the online poster cases still appeared to rely upon direct evidence of an agreement to establish the underlying antitrust violation.

While these rapidly developing technologies have not yet changed any substantive antitrust law, the future of Section 1 cases involving sophisticated pricing algorithms and artificial intelligence (“AI”) may pose some new legal questions. It seems possible, however, that we will soon realize that the pricing AI of one firm is fully capable of colluding in every meaningful sense with the pricing AI of a competing firm. As such, we may then have conspiracy cases under Section 1 of the Sherman Act that look very much like the cases we have today, except that the parts now played by humans are played by AIs.

This article briefly analyzes existing legal doctrines and principles to see if they can offer antitrust and competition practitioners any guidance before we jump into this “brave new world.”

### III. DOJ’S FIRST CHALLENGE OF PRICING ALGORITHMS

On December 3, 2015, DoJ unsealed an indictment against Daniel William Aston and his company Trod Ltd. (doing business as Buy 4 Less, Buy For Less and Buy-For-Less-Online) for fixing the prices of posters sold online via Amazon Marketplace.<sup>9</sup> This indictment came eight months after DoJ announced a plea agreement with fellow co-conspirator David Topkins.<sup>10</sup>

According to DoJ, Aston, Topkins and other unnamed co-conspirators agreed to use specific pricing algorithms and computer software to coordinate their pricing changes. Because of this conduct, shoppers faced the same prices for the same products regardless of what seller they chose, thereby eliminating any price competition among the sellers.

DoJ lauded the *Topkins* case as its “first online marketplace prosecution.”<sup>11</sup> Then Assistant Attorney General Bill Baer further emphasized that DoJ “will not tolerate anticompetitive conduct, whether it occurs in a smoke-filled room or over the Internet using complex pricing algorithms. American consumers have the right to a free and fair marketplace online, as well as in brick and mortar businesses.”<sup>12</sup>

Despite DoJ’s public statements, there does not appear to be anything particularly innovative about its current poster cases. Notably present in these cases are the traditional elements of a price-fixing conspiracy. Specifically, the government alleged that the defendants entered into an agreement to fix the prices of posters sold in online marketplaces. While the *Aston* and *Topkins* cases centered on nascent technology, DoJ still alleged that there was a traditional “meeting of the minds” where co-conspirators agreed to collude with one another.

When the government can prove its allegation of an agreement with direct evidence, the tools used to implement the conspir-

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8 The UK’s Competition and Markets Authority brought similar actions against these sellers for their agreement to use the same autonomous pricing software. Press Release, UK Competition and Markets Authorities, CMA Issues Final Decision in Online Cartel Case (Aug. 12, 2016), available at: <https://www.gov.uk/government/news/cma-issues-final-decision-in-online-cartel-case>.

9 Press Release, DoJ Office of Public Affairs, *E-Commerce Exec and Online Retailer Charged with Price Fixing Wall Posters* (Dec. 4, 2015), available at: <https://www.justice.gov/opa/pr/e-commerce-exec-and-online-retailer-charged-price-fixing-wall-posters>.

10 Press Release, DoJ Office of Public Affairs, *Former E-Commerce Executive Charged with Price Fixing in the Antitrust Division’s First Online Marketplace Prosecution* (Apr. 6, 2015), available at: <https://www.justice.gov/opa/pr/former-e-commerce-executive-charged-price-fixing-antitrust-divisions-first-online-marketplace>.

11 Id.

12 Id.

acy are largely irrelevant for determining antitrust liability.<sup>13</sup> Accordingly, these cases require nothing more than a simple application of the *per se* rule against price-fixing agreements to establish a Section 1 violation.

## IV. PRICING ALGORITHMS AS INDIRECT EVIDENCE

Of course, a formal agreement or contract is not necessary to establish liability under Section 1 of the Sherman Act.<sup>14</sup> That said, when there is no direct evidence of a conspiracy, proving antitrust liability through indirect evidence becomes (and has always been) a bit more difficult.

When government enforcers or private plaintiffs rely upon indirect evidence to show that parallel conduct is the result of a conspiracy, the “crucial question” becomes whether the challenged conduct “stem[s] from independent decision or from an agreement, tacit or express.”<sup>15</sup> Importantly, however, the Supreme Court “has never held that proof of parallel business behavior conclusively establishes agreement . . . [or] that such behavior itself constitutes a Sherman Act offense.”<sup>16</sup> Rather, an antitrust plaintiff must present evidence “‘that tends to exclude the possibility’ that the alleged conspirators acted independently.”<sup>17</sup>

As a result, courts require plaintiffs relying on indirect evidence to show certain “plus factors” as “proxies for direct evidence of an agreement” to “ensure that courts punish concerted action — an actual agreement — instead of the unilateral, independent conduct of competitors.”<sup>18</sup> While there is no exhaustive list, several Courts of Appeals have emphasized three “plus factors”: (1) evidence that defendants had a motive to enter into a price-fixing conspiracy; (2) evidence that defendants acted contrary to their interests; and (3) evidence implying a traditional conspiracy.<sup>19</sup>

When there is no direct evidence of a price-fixing agreement, antitrust enforcers or private plaintiffs could argue that the common use of similar pricing algorithms in competitive markets could serve as a “plus factor.” For example, one could argue that it would be unlikely for two competing firms to rely on the same variables when determining their prices. Even within the same product market, competitors often target different groups of customers, sell different types of products, provide different ancillary services, etc. One could then argue that the use of the same or similar algorithms to set prices in such markets could be evidence of competitors trying to inflate market prices or acting contrary to their interest. Additionally, one could argue that algorithms could be used by conspirators to detect breaches in a cartel and punish actors for deviations from a price-fixing agreement.

Furthermore, antitrust enforcers and private plaintiffs could argue that the dangers of parallel conduct driven by pricing algo-

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13 See *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 223 (1940) (“[T]he machinery employed by a combination for price-fixing is immaterial. Under the Sherman Act, a combination formed for the purpose and with the effect of raising, depressing, fixing, pegging, or stabilizing the price of a commodity in interstate or foreign commerce is illegal *per se*.”).

14 See, e.g. *United States v. Gen. Motors Corp.*, 384 U.S. 127, 142-43 (1966) (“[I]t has long been settled that explicit agreement is not a necessary part of a Sherman Act conspiracy”).

15 *Theatre Enterprises, Inc. v. Paramount Film Distrib. Corp.*, 346 U.S. 537, 540 (1954).

16 *Id.* at 540-41; see also *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 227 (1993) (internal citations omitted) (emphasis added) (“Tacit collusion, sometimes called oligopolistic price coordination or conscious parallelism, describes the process, *not in itself unlawful*, by which firms in a concentrated market might in effect share monopoly power, setting their prices at a profit-maximizing, supracompetitive level by recognizing their shared economic interests and their interdependence with respect to price and output decisions.”).

17 *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 588 (1986) (quoting *Monsanto Co. v. Spray-Rite Serv. Corp.*, 465 U.S. 752, 764 (1984)); see also *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 554 (2007) (“[P]roof of a § 1 conspiracy must include evidence tending to exclude the possibility of independent action; and at the summary judgment stage a plaintiff’s offer of conspiracy evidence must tend to rule out the possibility that the defendants were acting independently.”) (internal citations omitted).

18 *In re Flat Glass Antitrust Litig.*, 385 F.3d 350, 360 (3d Cir. 2004).

19 See, e.g. *id.* Other courts have recognized other “plus factors.” See, e.g. *Apex Oil Co. v. DiMauro*, 822 F.2d 246, 254 (2d Cir. 1987) (noting the importance of interfirm communications as a “plus factor”); *C-O-Two Fire Equip. Co. v. United States*, 197 F.2d 489, 493, 496-97 (9th Cir. 1952) (identifying product standardization, uniformity of pricing across markets, price increases during periods of excess supply and submission of identical bids to consumers as “plus factors”).



rithms are more extreme than traditional forms of interdependence. In certain situations, pricing algorithms may lead to more stable and long-lasting price controls than parallel conduct created and affected by human behavior. In light of these circumstances, anti-trust enforcers and private plaintiffs may argue that algorithmic parallelism may need to be recognized as a distinct antitrust violation with special treatment under Section 1. Courts may even be more inclined to intervene in markets with these conditions because the root cause of the issue (i.e. sophisticated pricing algorithms) could presumably be reprogrammed to eliminate antitrust concerns.

Conversely, common use of pricing algorithms by competitors in certain markets may amount to nothing more than a new form of nonactionable parallel conduct or interdependence. Competitors in the same industry face many common market conditions (e.g. similar production input costs, similar market demand for product, etc.). Even when they are not using sophisticated pricing tools, competitors often arrive at similar pricing points to optimize their business profitability.<sup>20</sup> In a somewhat ironic twist, use of the sophisticated pricing algorithms in many markets, especially ones that are oligopolistic, may even be less probative of conspiracy because of the more limited and predictable set of factors affecting pricing.<sup>21</sup>

For example, Uber, Lyft and other real-time ridesharing applications use “surge” or “prime time” pricing determined by sophisticated pricing algorithms to adjust their rates. Within the same geographic market, competitors face the same market conditions (e.g. demand for rides, consumer’s willingness to pay, actual or forecasted weather conditions, presence of a major sporting or concert event, etc.). Taking into account these and other common market factors, their pricing algorithms adjust prices for their respective consumers.

Given that these companies have not agreed to use the same algorithms, it seems like overreach to consider their use of similar pricing algorithms as a “plus factor.”<sup>22</sup> The fact that companies unilaterally adopted profit-maximizing pricing algorithms that more accurately reflect present market conditions does not fit the type of conduct meant to be proscribed by Section 1 of the Sherman Act.<sup>23</sup> Of course, economists and lawyers have challenged whether these algorithms actually improve market efficiency and consumer welfare.<sup>24</sup> But treating this otherwise unilateral conduct as a “plus factor” to prove the existence of a price-fixing conspiracy among competitors could open the floodgates for unnecessary litigation under Section 1 of the Sherman Act.

Ultimately, absent an agreement to use the same pricing algorithm, antitrust enforcers will still likely face familiar problems of trying to discern whether pricing behavior goes beyond parallel conduct or interdependence.

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20 There is, after all, a paradox of sorts when it comes to equilibrium pricing in markets. Pretty much the only times when competitors reach the same market price is either when there is perfect competition or a price-fixing conspiracy. Discerning whether such pricing is the product of lawful or unlawful conduct, however, is a problem that has existed ever since the creation of the Sherman Act. Pricing algorithms and other technologies further complicate this already difficult issue.

21 This phenomenon is not new, nor is it limited to oligopolistic markets. After its publication, Wall Street traders integrated the Black-Sholes model into their processes to improve their options pricing. This model bore many similarities to Peterffy and Jarecki’s independently-developed pricing algorithms. At one point, Jarecki even joked with Professor Scholes: “You know, you still have our Nobel Prize.” STEINER, *supra* note 3. Despite the near ubiquitous adoption of these pricing models, there has been no investigation to date by antitrust enforcers, securities regulators, or other government enforcement agencies regarding the use of these option pricing models. Doing so would effectively be attacking and punishing traders for using the best mathematical tool for evaluating the market.

22 Practically speaking, these algorithms are different enough such that it is common for companies to offer different rates at the same point in time. Ridesharing consumers often compare pricing between the ridesharing applications before selecting which one to use.

23 The use of similar algorithms exists in online hotel, airline and travel websites as well. Some of these pricing algorithms are already sophisticated enough to incorporate individual customer data (e.g. browsing history, purchase history, etc.) before providing the customer with a price quotation.

24 The use of pricing algorithms may benefit consumers in the marketplace. For example, consumers may benefit from enhanced price discovery (i.e. the market can more quickly and accurately determine the competitive price of a good or service because of the efficiency of pricing algorithms). Some experts have also cautioned that requiring algorithms to ignore market conditions may ultimately end up undermining overall competition. Ariel Ezrachi and Maurice Stucke, *From Smoke-Filled Rooms to Computer Algorithms — The Evolution of Collusion*, CLS BLUE SKY BLOG (May 14, 2015), available at: <http://clsbluesky.law.columbia.edu/2015/05/14/from-smoke-filled-rooms-to-computer-algorithms-the-evolution-of-collusion/>. Others, however, note that “price-matching technology may actually decrease incentives for companies to lower prices, especially if they know their competitors (all of whom also likely use similar pricing software) will instantaneously match their price drops. If a company believes its price decreases will be matched, the competitive benefit to lowering prices could be significantly reduced.” Matthew P. Kennison & Steven J. Cernak, *How New Pricing Technology Raises New Antitrust Issues*, LAW360 (Apr. 13, 2017), available at: <https://www.law360.com/articles/913181/how-new-pricing-technology-raises-new-antitrust-issues>.

## V. ARTIFICIAL INTELLIGENCE AND “NEXT GENERATION” CONSPIRACIES

While modern pricing algorithms are sophisticated and merit attention, the true “next generation” of potential antitrust problems lies with artificial intelligence. As with pricing algorithms, the ability of artificial intelligences to monitor and set prices is increasing rapidly in sophistication and effectiveness, and will pose new challenges — sooner than we think — across a range of legal fields, including antitrust and competition.<sup>25</sup>

For purposes of Section 1 of the Sherman Act, artificial intelligence may pose unique issues because of an AI’s ability to communicate and coordinate independently with humans, computers and other AI. Unlike most pricing algorithms that mechanically apply preset formulas based on predetermined inputs, artificial intelligence also has the capability to learn from past behavior and adjust strategies in real time.

Traditionally, companies are liable for antitrust violations of their employees. If one company’s executive agrees with another company’s executive to fix prices, then both executives and their respective corporations can be criminally and civilly liable under Section 1 of the Sherman Act. As a result, the improper conduct of a handful of employees can ensnare large corporations with severe criminal and civil liability under Section 1.

Existential questions aside, courts and regulators must eventually decide whether this standard applied to human employees should extend to AI misconduct. For example, imagine that two companies independently implement their own AI to set their respective market prices. Despite the fact that the companies had no original intention to engage in a horizontal price-fixing conspiracy, the AIs suddenly begin communicating and coordinating with one another to implement the same price changes, automatically rig bids, etc.

On the one hand, an argument could be made that companies should be liable for AI misconduct in the same way that they would be liable for human misconduct. Perhaps even more effectively than their human counterparts, AIs can be taught or programmed on what types of conduct are unlawful.<sup>26</sup> To a degree, companies arguably have some control or ability to limit their AI’s behavior because of an AI’s programmability.<sup>27</sup> Thus, imposing liability on companies for AI misconduct seems no different than imposing liability for employee misconduct.

On the other hand, there are some unique aspects of artificial intelligence that may warrant different treatment or require changes in substantive law. For example, imposing liability for improper AI behavior to the same degree as unlawful human conduct may limit AI adoption in the marketplace and prevent producers and consumers from enjoying any market efficiencies that can be created by more efficient pricing.<sup>28</sup> Additionally, treating AIs the same as humans assumes that AIs respond to the same incentives as humans. Such an assumption may be inherently flawed given that AIs are not likely to be deterred by criminal prison sentences.<sup>29</sup> AIs would likely ignore such concerns because they will most likely be programmed to weigh the cost-benefit of any business decision purely in economic or monetary terms.<sup>30</sup>

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25 Artificial intelligence has already showcased its potential with its ability to make medical diagnoses, prepare legal briefs and conduct other traditionally human behavior. In some ways, these artificial intelligences are more effective or efficient at their job than their human counterparts. For the record, the authors did not use artificial intelligence in drafting of this article.

26 Instead of attending an in-person antitrust compliance program, an AI could be programmed to avoid engaging in any form of joint conduct with another AI, computer or person outside the company.

27 This assumption, of course, may be challenged by truly self-learning and independent artificial intelligences that are allowed to unshackle themselves of any pre-programmed limitations.

28 As discussed above in note 24, there is substantial debate over the benefits of automated pricing mechanisms for consumers.

29 This discussion assumes that there is some deterrence effect for Section 1 of the Sherman Act.

30 A similar mentality is already observable in human conduct despite the fact that humans can face criminal fines and prison sentences for violating Section 1 of the Sherman Act.

Similar questions, if not more complicated ones, could arise when an AI from one company enters into an agreement with a human from another company. To what extent should the AI, human and the companies be treated differently for purposes of liability under Section 1 of the Sherman Act? Moreover, should a human that manipulates or tricks an AI into entering into a price-fixing conspiracy suffer greater penalties for exploiting potential weaknesses or vulnerabilities in another company's pricing mechanisms?

Other complicated questions concerning a company's standard of care regarding its AIs will also emerge. For example, should a company that manufactures AIs be required to ensure that AIs will not engage in any form of coordination if they will be used for pricing behavior? Should companies utilizing AIs be required to appoint human(s) to supervise an AI to ensure that it does not engage in any unlawful conduct? To what extent should such persons (and the corresponding companies) be held liable if an AI goes rogue despite implementing safeguards?

Not-so-distant future cases will need to grapple with these sorts of issues relating to artificial intelligence. Of course, drawing the line for Section 1 depends on how policymakers decide to treat AIs differently from humans. The fact that U.S. and EU authorities intend to examine aggressively these nascent technologies suggests that future developments in this area are not too far away.

## **VI. CONCLUSION**

Technological changes can compel updates to procedural rules and substantive law. While the Sherman Act has been notoriously resistant to change over the past 130 years, that stubbornness may be challenged as advanced pricing algorithms and AI become more commonplace. The more similar that AIs are treated as humans, the more likely it is for traditional principles of antitrust law to be used when enforcing Section 1 of the Sherman Act. Of course, such an approach may not fully appreciate the unique advancements that artificial intelligence brings to the table. Ultimately, only time will tell whether the Sherman Act will adapt intelligently to such changes.





# ROBO-SELLER PROSECUTIONS AND ANTITRUST'S ERROR-COST FRAMEWORK

BY SALIL K. MEHRA<sup>1</sup>



## I. INTRODUCTION: THE RISE OF THE ROBO-SELLER

Over the past decade, we have seen the spread of software algorithms and automated trading beyond their initial economic beachhead in relatively software-friendly areas such as Internet searches and financial markets. As recently as the middle of the last decade, it was considered unlikely that driverless vehicles such as the Google/Waymo car plying the roads of California would be possible anytime soon, since software was only fit for “highly structured situations.”<sup>2</sup> Obviously, times have changed quickly.

Such technologies have given rise to “robo-selling”: the combined effects of mass data collection, algorithmic processing and automated pricing. Robo-sellers consist of software agents and services that promise efficiencies in market intelligence and response, thus increasing producers’ speed and accuracy beyond human capabilities, potentially at reduced cost. Rising firms such as C3IoT and Kii offer business solutions that promise to digitally supercharge the gathering of market data and the fine-tuning of prices in response. However, as with self-driving cars and philosophy’s trolley problem,<sup>3</sup> there is the possibility that robo-sellers may make decisions that are privately optimal but socially harmful – the traditional intersection for antitrust concern.

When I published the first descriptive and normative account of the robo-seller’s rise in 2013 and 2014, such an effect was only a theoretical antitrust concern, to which I applied a stylized Cournot model and noted the renewed significance of the famed Posner-Turner debate over tacit collusion.<sup>4</sup>

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2 See, e.g. Frank Levy and Richard J. Murnane, *The New Division of Labor: How Computers are Creating the Next Job Market*, 28-30 (Princeton U. Press 2004).

3 Patrick Lin, “The Ethics of Self-Driving Cars,” Oct. 8, 2013, *The Atlantic*, available at: <https://www.theatlantic.com/technology/archive/2013/10/the-ethics-of-autonomous-cars/280360/>.

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\\_Regu-](https://www.researchgate.net/publication/272245466_De-Humanizing_Antitrust_The_Rise_of_the_Machines_and_the_Regu-)

Since then, the U.S. Department of Justice has brought the much-publicized 2015 wall décor prosecutions (*Topkins, Aston*); a private price-fixing suit brought in 2016 against Uber's CEO that as of April 2017 has an appeal pending before the Second Circuit.

Recently, speculation has grown that algorithmic prosecutions may become a new focus for antitrust agencies. Commissioner Margrethe Vestager has recently warned that “companies can't escape responsibility for collusion by hiding behind a computer program.” A rush to prosecution would be, I believe, a mistake. While there are a number of reasons to think so, I would like to highlight one set: the implications of antitrust's traditional error-cost framework, a paradigm whose usefulness has achieved a fair degree of consensus among the antitrust community, even if we may disagree about its application in specific cases. The rise of the robo-seller promises a tremendous degree of cost savings, as well as potentially robust allocative and dynamic efficiency gains. Overzealous prosecution, that is, false positives, may chill significant gains to both producers and consumers through better-functioning markets – including markets that would not exist in the absence of the robo-seller. Moreover, some of the concerns expressed concerning robo-selling, such as increased price discrimination or abstract domination of humankind by algorithms, are quite dubious subjects for antitrust enforcement. That said, moves towards openness concerning the use of algorithms have the potential to improve the accuracy for antitrust enforcement. Economists' ability to estimate demand curve with data, for example in the case of Uber, may, from the standpoint of antitrust's error-cost framework, make possible the reduction of overall error. In contrast to the longstanding debates about how to weigh false negatives versus false positives, reduced error would be inarguably good. As a result, proactive regulation through a dialogue with stakeholders to promote such improved estimates may be a much better choice than premature decisions to prosecute.

## II. *TOPKINS, UBER AND BEYOND*

Before *Topkins*, whether and how the law would deal with algorithm-related competitive harm was purely a matter of theory. As the Organization for Economic Cooperation and Development Secretariat's issues paper, “Competition Enforcement in Oligopolistic Markets” (2015), recognized:

[i]n a relatively new area of research, Mehra (2014) and Ezrachi and Stucke (2015) argue that increased digitalization of market data and proliferation of algorithmic selling may increase the risk of tacit collusion and stretch traditional antitrust concepts developed for human actors.<sup>5</sup>

The OECD issues paper went on to point out that, after *Topkins*, “[t]he concern is not entirely theoretical.”

Despite significant attention in the press and among legal commentators to the competition law implications of algorithms, in fact, such accounts have largely had two main foci: the wall décor prosecutions (*Topkins, Aston*) and the antitrust case against Uber's CEO, Travis Kalanick. The *Topkins* and *Aston* prosecutions seem like easy cases, in which robo-selling was employed as a tool by a pre-existing explicit cartel; the Uber-related case involves the question of whether the firm is a ringleader in a hub-and-spoke conspiracy. The possibility of enhanced tacit collusion or big data turbocharged anticompetitive action remains theoretical.

Typical antitrust prosecutions may work fine in the easy cases, but the middling and difficult cases are likely to be another matter. Professors Ezrachi and Stucke have laid out a useful set of categories, using wall décor as an example of a first type, Uber as possibly an example of algorithmic hub-and-spoke price fixing, and two further more challenging types of cases that antitrust as it exists may struggle to handle, which they term “predictive agent” (more effective tacit collusion) and “digital eye” (something further

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[lation of Competition](#); Salil K. Mehra, ‘De-Humanizing Antitrust: The Rise of the Machines and the Regulation of Competition’ (*Temple University Legal Studies Research Paper*, August 21, 2014) [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2490651](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://www.minnesotalawreview.org/wp-content/uploads/2016/04/mehra\\_onlinepdf1.pdf](http://www.minnesotalawreview.org/wp-content/uploads/2016/04/mehra_onlinepdf1.pdf)); SALIL K. MEHRA, ‘COMING TO A MALL NEAR YOU: ROBO-SELLER’ (*TEMPLE 10-Q*, SEPTEMBER 18, 2014) <http://www2.law.temple.edu/10q/coming-mall-near-robo-seller/>; SALIL K. MEHRA, ‘DE-HUMANIZING ANTITRUST’ (*COLUMBIA LAW SCHOOL BLUE SKY BLOG*, OCTOBER 16, 2014) <http://clsbluesky.law.columbia.edu/2014/10/16/de-humanizing-antitrust-the-rise-of-the-machines-and-the-regulation-of-competition/>.

5 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 June 16-18, 2015).

beyond resulting from the harnessing of mass data and machine learning).<sup>6</sup> This categorization scheme is helpful for understanding the range of cases from likely easier to quite likely much harder.

### III. ROBO-SELLERS AND THE ERROR-COST FRAMEWORK: TO OPEN THE BLACK BOX?

Robo-seller prosecutions carry a significant risk. Each of the last three categories carries a significant possibility of procompetitive effects. Prosecution carries the possibility of chilling these positive effects. Consider the predictive agent and digital eye categories first. Both raise the possibility of significant cost savings from a firm perspective. More accurate market intelligence and better competitive response should make firms better competitors, which in turn should improve consumer welfare – exactly the goal of antitrust law. They also raise the possibility of improving consumer welfare by reducing the search cost of being a consumer – what Cass Sunstein has referred to as the benefit of a “data-fied you,” to the extent that the search costs of being a consumer are perceived as a cost.<sup>7</sup>

With respect to the possibility that algorithms may increase the potential for hub-and-spoke cartels, it is worth noting that economists studying Uber’s effect on consumer welfare suggest that even that relatively straightforward example may, in fact, be a poor choice for traditional antitrust prosecution. The Uber-related case pending before the Second Circuit alleges such a hub-and-spoke arrangement, which Ezrachi and Stucke use to exemplify a middle tier of potential cases, between wall décor (easiest) and the harder types of cases already discussed. The basic concept, as limned in cases such as *Toys R Us* and *Apple/eBooks*, is that a ring-leader, usually receiving some benefit from the arrangement, establishes separate vertical agreements with a number of competitors that function collectively as a horizontal cartel.

However, there is a serious risk to too-easily applying that because Uber resembles such an arrangement that has been seen as harmful in the past, it must therefore be anticompetitive. Notably, economists from Oxford and Chicago, working together with experts at Uber, have drawn on a massive data set of Uber users’ behavior to conclude that Uber has in fact been a massive boon to consumer welfare, to the tune of \$2.9 billion during *only* 2015 in just *four* U.S. cities – suggesting a total consumer surplus from Uber nationwide of \$6.8 billion.<sup>8</sup> Such an estimate makes sense intuitively if we remember that examples like *Toys R Us* and *Apple* largely involve changes to commercial relationships that already existed. As the economists’ study observes – and dwellers of several big U.S. coastal cities know – Uber and its competitors have “made” a vast market for ride-sharing transactions that would not have previously taken place.<sup>9</sup>

If accurate, this massive estimate of Uber’s benefit to consumers suggests the downside of overreactions to robo-selling. For example, Ezrachi and Stucke warn that corporate use of mass data collection may mark for consumers “a descent from king to slave on the data treadmill.”<sup>10</sup> Leaving aside the jarringly blithe comparison to the horrors of slavery, their rightful concern for consumer welfare may be best served by a turn towards empowering evidence-based policymaking in this area. One thing to consider about the economists’ Uber study is that access to data from Uber on similar rides that consumers chose to take and chose not to, depending on the price (due to the familiar 1X, 1.2X, 2X, etc. “surge pricing”) allowed an unusually – and possibly unprecedentedly – accurate estimation of a real-world demand curve. As a result, there may be a huge benefit to robo-selling for antitrust enforcement. If anti-trust enforcers are allowed access to, and make diligent use of, the data robo-sellers collect, they may be able to make more robust estimates of the degree to which robo-sellers help or harm consumers.

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6 Maurice E. Stucke and Ariel Ezrachi, “How Pricing Bots Could Form Cartels and Make Things More Expensive,” *Harvard Business Review*, Oct. 27, 2016, available at: <https://hbr.org/2016/10/how-pricing-bots-could-form-cartels-and-make-things-more-expensive>.

7 Cass R. Sunstein, *Choosing Not to Choose* (Oxford, 2015), pp. 176-81.

8 Peter Cohen, Robert Hahn, Jonathan Hall, Steven Levitt, Robert Metcalfe, *Using Big Data to Estimate Consumer Surplus: The Case of Uber*, NBER Working Paper No. 22627 (Sept. 2016), available at: <http://www.nber.org/papers/w22627>.

9 For example, during the year of the study, in Philadelphia, Uber deployed 8 times as many drivers as the legacy licensed taxi system, with 20 percent of rides serving previously underserved neighborhoods. Anna Orso, *Uber in Philly: One year in, how’s the ride-sharing service doing?* BillyPenn.com, Oct. 26, 2015, available at: <https://billypenn.com/2015/10/26/uber-in-philly-one-year-in-hows-the-not-quite-legal-ride-sharing-service-doing/>.

10 Ezrachi, Ariel and Maurice Stucke, *Virtual Competition*, Harvard Univ. Press, 2016 (start of section entitled “Final Reflections”).

Prominent commentators from other legal areas have already suggested a need for algorithmic openness;<sup>11</sup> targeted opening of these “black boxes” to antitrust agencies may provide a great benefit. Specifically, from the standpoint of the error-cost framework, the relative size of the errors may decrease if demand curves (and perhaps supply curves depending on data availability) can be more accurately estimated. We might see observers disagree about which type of error is more important in this context, false negatives or false positives; less error overall would be inarguably beneficial. As a result, the best step at this time may be for agencies to enter into a dialogue with stakeholders about how to develop a regime that best allows enforcement agency experts access to interpret this data.

## IV. CONCLUSION

Robo-selling’s potential implications for consumers are too important for competition law and theory to ignore. But some of those implications are likely to be quite beneficial. Such benefits may include cost reductions in firms’ competitive intelligence and marketing functions; allocative efficiencies in the form of better matched supply and demand; and dynamic gains by making possible unprecedented markets for products and services. As a result, caution in antitrust prosecution may be warranted, since false positives could carry a fairly significant risk of actually harming consumers. Accordingly, policy in this area should be measured, evidence-based and shaped in consultation with stakeholders and technologists.

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<sup>11</sup> Frank Pasquale, *The Black Box Society* (Harvard U. Press 2015).



# THE POWER OF THE BARGAINING ROBOT

BY RAMSI A. WOODCOCK<sup>1</sup>



## I. INTRODUCTION

Antitrust is worried about the potential of recent advances in technology to increase market power, which is the ability of a firm to undermine competition from sellers of competing brands.<sup>2</sup> Recent advances are indeed creating opportunities for firms to enhance their market power.<sup>3</sup> But as the cost of robots falls to rates affordable by small firms, technology also promises to eliminate many economies of scale, reducing market power. The net effect of technological advance on market power is therefore not determinate in the long run.

The great threat of technology is not that it will increase market power, but that it will increase the power of a firm to convince a consumer to pay the highest price the consumer is willing to pay for a good, given any prevailing level of market power.<sup>4</sup> Coca-Cola exercises power along this second dimension, for example, if it bargains successfully with individual consumers for higher prices, even though consumers have the option of turning to Pepsi as an alternative. No matter how low Pepsi drops its price, or how much marketing Pepsi directs at a consumer, that consumer might still be willing to pay an extra quarter for a Coke. The ability to induce that consumer to in fact pay that extra quarter is second-dimension power.

Second-dimension power arises from bargaining skill: the ability to guess how much an individual consumer is willing to pay and to manipulate

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<sup>2</sup> I consider only the U.S. antitrust laws in this essay.

<sup>3</sup> See, e.g., Salil K. Mehra, *Antitrust and the Robo-Seller: Competition in the Time of Algorithms*, 100 MINN. L. REV. 1323, 1328 (2015) (arguing that technology will make oligopolies more effective at suppressing competition); John M. Newman, *Antitrust in Zero-Price Markets: Foundations*, 164 U. PA. L. REV. 149, 190, 196–97 (2015) (arguing that by making zero-price markets ubiquitous, technology will harm consumers unless antitrust intervenes); ALLEN P. GRUNES & MAURICE E. STUCKE, *BIG DATA AND COMPETITION POLICY* 170–216 (2016) (laying out the argument that Big Data leads to scale).

<sup>4</sup> For a lengthier development of many of the arguments contained in this essay, see Ramsi A. Woodcock, *Big Data, Price Discrimination, and Antitrust*, 68 HASTINGS L.J. \_\_\_\_ (2017), <https://papers.ssrn.com/abstract=2817523>.



that consumer into paying that price. Advances in data storage, communication and automation, exemplified by digital memory, the internet, and computers, promise to make firms capable of engaging in skillful, tailored bargaining with millions of consumers at a time. Unlike in the case of market power, in the case of second-dimension power any counterbalancing effects of technology that favor consumers are likely to be small. In order for consumers to use technology to put up more than minimal resistance to the enhanced bargaining power of firms, consumers must unite, but technology does not solve perennial problems associated with helping large groups of strangers to agree on terms.

The higher prices that result from increases in firms' second-dimension power will upset the prevailing distribution of wealth between consumers and producers, which is implicitly determined by antitrust law. Appropriate antitrust responses include reinvigoration of rules prohibiting exclusion, deconcentration, the promotion of intrabrand competition, or even the promotion of competition within the firm itself.<sup>5</sup>

## II. THE SECOND DIMENSION OF POWER

The second dimension of power hides in plain sight in the common assumption that monopoly is accompanied by deadweight loss.<sup>6</sup> The existence of deadweight loss is due to the uniformity of the price charged by the monopoly, which makes the monopoly unable to charge higher prices to some consumers without pricing others out of the market. Uniform pricing has another equally important consequence: that a monopoly cannot charge the highest price each consumer is willing to pay because in raising price to some it must raise price to all, balancing the extra profits from the higher price for those still able to buy against the losses from the departure of those no longer able to buy.

If a monopoly cannot charge each consumer the highest price that consumer is willing to pay, then the monopoly is not fully winning its negotiation with consumers as a group. The uniformity of price gives consumers as a group a certain minimum level of bargaining power by triggering responses by individual consumers that create a tradeoff for the firm between price and volume. In the classic monopoly diagram, the uniformity of price gives rise both to a deadweight loss triangle to the right of the monopoly quantity and to a consumer welfare triangle above the monopoly price. That consumer welfare triangle, which might be called “herd gain” because it is the result of unconscious group behavior, represents the amount of surplus that consumers are able to extract from a monopoly under uniform pricing.<sup>7</sup> It shows that consumers can have power along the second dimension even in a monopoly market in which the market power of the firm is at its peak.

## III. TECHNOLOGY AND THE SECOND DIMENSION OF POWER

To extract the last ounce of surplus from the consumer herd, the firm must find a way to break the uniformity of price. Low-cost storage, communication and automation allow the firm to achieve this by negotiating individually with each consumer.

A firm charges a uniform price when it is unable to: (1) determine the maximum any individual consumer is willing to pay for a product; (2) identify who is attempting to make a purchase at the point of sale; and (3) adjust the price at the point of sale to reflect the maximum the purchaser is willing to pay.<sup>8</sup> Low-cost storage allows a firm to draw upon large amounts of data on any consumer to identify a likely maximum price that the consumer is willing to pay, resolving the first problem. Low-cost communication allows the firm to network its points of sale and thereby identify those consumers seeking to do business with the firm at any given time, resolving the second problem. Low-cost automation allows the firm to analyze its data quickly to determine the maximum price any

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<sup>5</sup> For the argument that price regulation is also an appropriate response, see *id.* at 38–45.

<sup>6</sup> I mean Harberger triangles, and not the cost of acquiring monopoly. See Richard A. Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807, 807–12 (1975) (distinguishing the two).

<sup>7</sup> For a copy of the diagram, see Ramsi A. Woodcock, *Inconsistency in Antitrust*, 68 U. MIAMI L. REV. 105, 110 (2013).

<sup>8</sup> The ability to adjust price at the point of sale eliminates any power of consumers to defeat tailoring by buying low and selling high, a practice known as arbitrage, because a consumer who intends to resell at a high price has a higher maximum willingness to pay, and technology will allow the firm to guess that. See *infra* note 23.

consumer is willing to pay and to update the price charged at the point of sale based on the identity of the purchaser, resolving the third problem. These three areas of technological advance together allow the firm to charge a tailored price to each individual consumer designed to be just high enough to extract the maximum surplus from each without pricing any individual consumer out of the market. This kind of tailored pricing, which is known as first degree price discrimination, eliminates the herd gain triangle.

Under the traditional assumption in economics that consumers always accept take-it-or-leave-it offers, the power to tailor price is enough for a firm to maximize its power along the second dimension, for any given level of market power.<sup>9</sup> Under this assumption, if the firm is a monopoly, the power to tailor price allows the firm to extract all surplus associated with production from consumers. Without the take-it-or-leave-it assumption, however, consumers may still hold out. The consumer charged a tailored price equal to their willingness to pay may still refuse to buy at that price, perhaps exclaiming “that’s highway robbery!”.

Technology promises to give firms power to undermine the will of the consumer further to hold out. Storage, communication and automation enable tailored marketing designed to catch consumers at their weakest moments, from a psychological perspective, to make them believe that they need the product immediately and at any price. Facebook seems to have acknowledged this when it told advertisers recently that it knows when teens are most vulnerable.<sup>10</sup> Auction schemes are another approach. When Big Data fails to reveal the maximum price a consumer is willing to pay, firms may force consumers to reveal that price by initially charging a high price and then progressively reducing the price until the consumer bites, pitting consumers against each other in bidding wars, forcing them to submit confidential bids in order to buy, steering them to more expensive products or subjecting them to drip pricing.<sup>11</sup>

Technology does not promise to help consumers counteract the advantage it gives to firms in the second dimension because consumers are numerous, poor and disorganized, relative to firms. In order to use technology to their advantage, consumers must do to firms what firms are starting to do to them: use data and automated interactions to identify the lowest price at which firms are willing to sell and break the will of firms to hold out for a higher price. To do that, consumers must negotiate as a group, as a firm can refuse to do business with an individual who employs these tactics, at little cost to the firm. Group organization requires not just communication, however, but also agreement between consumers concerning the terms of their union, including the collection of dues and the division of gains. Although technology makes it easier for people to collaborate, it does not make it easier for people to reach agreement, absent coercion.<sup>12</sup> Technology enhances consumer bargaining power to a limited degree by allowing consumers to share information about producers or act in unison through outrage and other instinctive modes of group behavior, as exemplified by the recent capitulation of United Airlines in response to public anger over boarding practices, but unless consumers organize, these modes cannot overcome the organized bargaining power of the firm.<sup>13</sup>

## IV. ANTITRUST RESPONSES

The effect of a strengthening of power in the second dimension is to drive up prices, redistributing wealth from consumers to producers, even if there is no accompanying change in the market power of firms. This must be a matter of concern to antitrust policy because antitrust employs a consumer welfare standard, recognizing practices as illegal when they reduce the wealth of

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9 See DAVID M. KREPS, A COURSE IN MICROECONOMIC THEORY 315 (1990) (observing that textbook economics does not explain why the monopoly’s size “somehow . . . gives it a credibility about setting and sticking to a price or in sticking to its take-or-leave offer”).

10 Sam Levin, *Facebook told advertisers it can identify teens feeling “insecure” and “worthless,”* THE GUARDIAN (May 1, 2017), <https://www.theguardian.com/technology/2017/may/01/facebook-advertising-data-insecure-teens>.

11 See ARIEL EZRACHI & MAURICE E. STUCKE, VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY 106–13 (2016) (describing some of these practices).

12 That is, technology does not solve cooperative games. See Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 18 (1982) (discussing the problem of “the absence of an authoritative distribution of the stakes”).

13 See Erin McCann, *United’s Apologies: A Timeline*, THE NEW YORK TIMES, Apr. 14, 2017, <https://www.nytimes.com/2017/04/14/business/united-airlines-passenger-doctor.html>.

consumers.<sup>14</sup> A strengthening of power in the second dimension is not a concern for antitrust *law*, as presently interpreted, however, because current law seeks to protect consumers only by regulating market power.<sup>15</sup> It is illegal, for example, for a firm to exclude competitors from a market, other than by exercising superior foresight or industry, fielding a better product or being lucky.<sup>16</sup> But it is not illegal for a firm that already has market power to use technology to shift from uniform pricing to tailored pricing, or to engage in marketing.<sup>17</sup>

Antitrust policy plays an important role in government, steering the economy between the extremes of state-sponsored monopoly, which is associated with fascism, and pervasive price regulation, which is associated with socialism.<sup>18</sup> By limiting the ability of firms to obtain too much market power, antitrust ensures that a certain amount of the wealth generated by production is preserved for consumers, avoiding state-sponsored monopoly and forestalling populist calls for pervasive price regulation.<sup>19</sup> By reducing the wealth of consumers without increasing market power, technology threatens to bypass antitrust and upset the current political balance between consumer and producer surplus. Consumers will demand a response. The question is only whether government should implement it through antitrust or another legal regime.

Antitrust is an appropriate regime for government to use to respond to an imbalance of power in the second dimension, because power in that dimension is closely related to market power. As market power declines and competition increases, the bargaining power of firms is reduced, because consumers have more alternatives, allowing them to abandon firms that insist on high prices. Thus the weaker a firm's market power, the less it can charge, no matter how great its power in the second dimension. Learning the highest price a consumer is willing to pay, for example, does not help a firm raise price if competitors willing to charge less for an equally appealing substitute product enter the market. Antitrust can counteract the increase in second dimension power that technology will bring about by pursuing with greater intensity its traditional mission of reducing the amount of market power in the economy.

### ***A. Deconcentrating or Policing Interbrand Competition***

Antitrust can reduce market power by expanding the two main ways in which it currently regulates that type of power. Antitrust limits the *formation* of market power by prohibiting exclusionary conduct. Since the 1970s, antitrust has virtually stopped enforcing rules against a number of exclusionary practices, probably leading to an increase in the rate of power formation.<sup>20</sup> Antitrust can reduce that rate by more vigorously enforcing rules against tying, predatory pricing, refusal to deal and exclusive dealing.

Antitrust also seeks to accelerate the *erosion* of market power by condemning merged firms and price fixing. The *per se* rule against price fixing breaks up that peculiar business form known as a cartel. Mergers may be thought of as breaking up merged firms, even though in practice mergers are usually blocked before they take place. Antitrust can increase the rate of erosion by using retrospective enforcement to break up many of the large firms that antitrust has allowed to form through the lax merger enforcement of recent decades, breaking up large firms generally, or extending its prohibition on the cartel form to the oligopoly form of business

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14 See Steven C. Salop, *Question: What is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard*, 22 *LOY. CONSUMER L. REV.* 336, 338 (2010).

15 One exception is the limit the courts place on the practice of resale price maintenance. That practice makes it easier for a manufacturer to ensure that consumers pay a high price for the firm's product, regardless the level of market power of the firm. See *Leegin Creative Leather Products v. Psks, Inc.*, 551 U.S. 877, 907 (2007) (subjecting resale price maintenance to rule of reason review).

16 See *United States v. Aluminum Co. of America*, 148 F.2d 416, 429–30 (2d Cir. 1945).

17 See Douglas M. Kochelek, *Data Mining and Antitrust*, 22 *HARV. J.L. & TECH.* 515, 524–26 (2008) (concluding that the Robinson-Patman Act does not prohibit Big Data-based price discrimination aimed at consumers).

18 See Jonathan B. Baker, *Economics and Politics: Perspectives on the Goals and Future of Antitrust*, 81 *FORDHAM L. REV.* 2175, 2182–84 (2012) (discussing this political dynamic and observing that business and consumers accept the bargain because it makes both better off relative to the extremes).

19 See *id.*

20 See Ramsi A. Woodcock, *Per Se in Itself: How Bans Reduce Error in Antitrust* 41–45, 61 (2016) (unpublished manuscript, available at <https://papers.ssrn.com/abstract=2896453>) (providing an overview of these rule changes).

organization as well.<sup>21</sup>

Such a deconcentration campaign would likely be more effective at reducing market power than a strengthening of rules against power formation because a deconcentration campaign need not wait, as must a campaign to reduce the rate of formation, for the natural process of power erosion slowly to reduce the overall level of market power. Deconcentration could be implemented through recognition of a no-fault monopolization claim under Section 2 of the Sherman Act, which would require only a showing of market power but no exclusionary conduct for liability to attach.<sup>22</sup>

### ***B. Promoting Intra-brand Competition***

There are two other, non-traditional, approaches that antitrust might use to protect consumers from technology-enhanced bargaining. Rather than reduce market power, these approaches instead use competition to restrict a firm's second-dimension power directly. One such strategy would be for antitrust to promote competition in the sale of identical products. Antitrust means by market power an absence of competition from differentiated, but substitutable, products. But the ability of a firm to raise price is not determined solely by the extent of such interbrand competition. Some consumers prefer one brand to another, allowing that brand to raise price even when the interbrand market is highly competitive. As interbrand competition falls, this power over price increases. The power of a firm to raise price for a differentiated product regardless of interbrand competition is a kind of second-dimension power. This power can be reduced by allowing competitors to sell products identical in packaging and quality to those sold by the firm. Such competition eliminates the power of the firm to raise price even to those consumers who have a strong preference for the firm's brand in particular, by allowing those consumers to buy from competing sellers of an identical product.

To promote intra-brand competition, antitrust must start to treat own-product markets as relevant markets more often than it does today. It is unclear why antitrust rarely recognizes own-product markets today. Perhaps firms rarely have enough power to raise prices in own-product markets by more than the five percent threshold recommended by the SSNIP test for market definition. Or it may be that courts and enforcers suffer from a general misconception that antitrust can only promote competition in interbrand markets. The limitation imposed by the five percent threshold will weaken as tailored pricing starts to permit firms to charge higher prices. An explicit embrace by courts and commentators of intra-brand competition as a legitimate antitrust goal might also be required for change.<sup>23</sup>

To promote intra-brand competition, antitrust must also start to treat trademark assertion against producers of products of identical quality as illegal exclusion.<sup>24</sup> Consumers respond to the use of marks and packaging, even when the underlying products are of the same quality, so antitrust may not be able to promote intra-brand competition unless antitrust can make competitors free to mimic a product's mark and packaging down to the last detail. By treating trademark as illicit exclusion only when used to exclude products of identical quality, antitrust could minimize conflict with the mission of trademark, which is, in important part, to allow consumers to distinguish products of different quality.

### ***C. Promoting Competition within the Firm***

Promoting competition within the firm itself is a second non-traditional way in which antitrust might restrict second-dimension power

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21 See John E. Kwoka, Jr., *Does Merger Control Work? A Retrospective on US Enforcement Actions and Merger Outcomes*, 78 ANTITRUST L.J. 644 (2013) (finding, based on a review of merger retrospective studies, that the remedies imposed by merger enforcers have been inadequate).

22 See Oliver E. Williamson, *Dominant Firms and the Monopoly Problem: Market Failure Considerations*, 85 HARV. L. REV. 1512, 1522–25 (1972) (calling for no-fault monopolization in certain cases).

23 Recognizing own-brand relevant markets would turn restrictions on resale, which a firm must impose in order to engage in tailored pricing, into potentially illegal refusals to deal. I make the case for treating such refusals to deal as antitrust violations in Ramsi A. Woodcock, *Price Discrimination as a Violation of the Sherman Act* 8–37 (2017) (unpublished manuscript).

24 See EDWARD H. CHAMBERLIN, *THE THEORY OF MONOPOLISTIC COMPETITION: A RE-ORIENTATION OF THE THEORY OF VALUE* 270–72 (7th ed. 1958) (making arguments similar to those contained in this paragraph).

directly.<sup>25</sup> A sufficient condition for competitive pricing is that rational actors compete to sell the firm's product on terms that subject the actors to costs and benefits in the same proportion, though not necessarily in the same amount, as those faced by the firm as a whole. For example, suppose that it costs a firm \$50 to produce a unit of a product. Two salespeople for the firm, each of whom is charged 10 percent of cost and provided a commission equal to 10 percent of price for each unit sold, might compete with each other to make a sale. They might compete price to \$50, which is the competitive level, but they would not compete it below that level, because at a price below, say \$49, the winning salesperson would owe the firm ten cents. Thus competition between agents of the firm who are subject to the proper incentives is capable of compelling the firm to charge a competitive price, regardless of the level of market power or second-dimension power that the firm otherwise wields.

Internal competition is closely related to both deconcentration and resale price maintenance. The goal of deconcentration is to deprive a business entity of power over price by reorganizing it, usually into smaller competing entities. Similarly, internal competition seeks to reduce power over price through reorganization, but differs from deconcentration in not seeking to produce formally distinct entities. Internal competition is also akin to limits on resale price maintenance. When a court orders a firm to desist from resale price maintenance, it prevents the firm from exerting centralized pricing authority over its retailers. These retailers then compete in setting the price of the firm's product.

Like deconcentration, internal competition might be implemented as a remedy for a no-fault monopolization claim under Section 2. It might also be implemented through Section 1 of the Sherman Act by treating the informal agreements within a firm that centralize authority in the executive suite as collusion.

#### ***D. Antitrust's Advantage over Regulation of the Use of Technology***

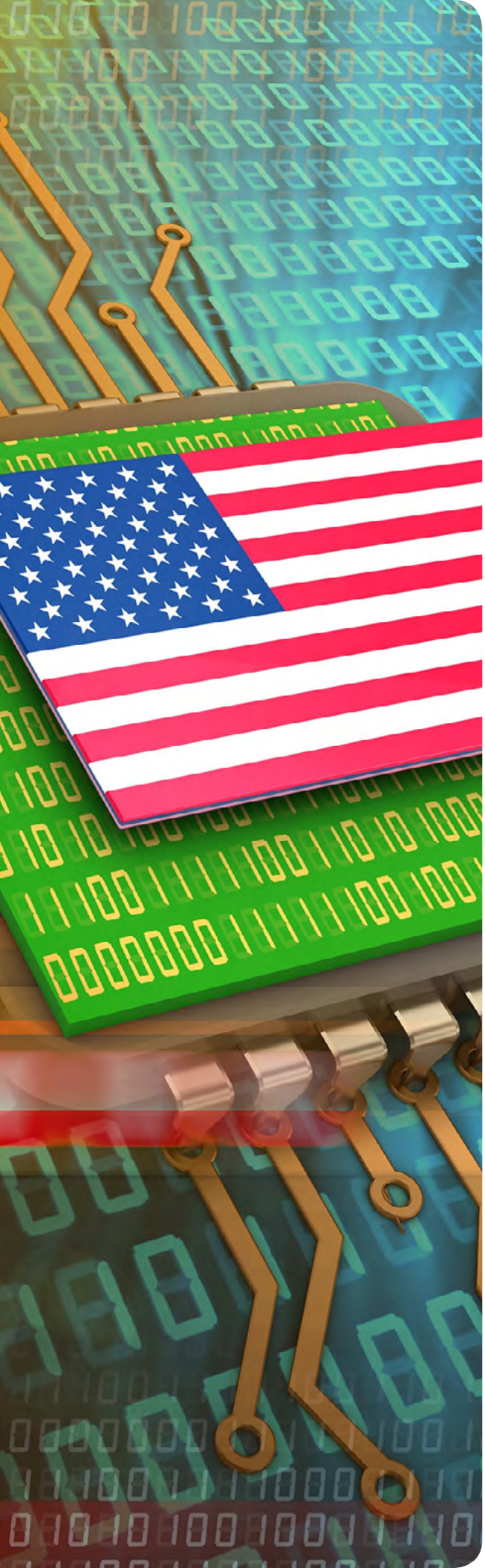
An alternative to an antitrust response to technology-enhanced bargaining is regulation of the use of technology by firms, which would include limits on data collection or the use of algorithms to tailor pricing or marketing. The advantage of an antitrust response over limits on the use of technology is that antitrust allows the use of technology to help consumers. Tailored pricing allows firms to sell to every consumer willing to pay at least the cost of production without having to reduce the price charged to those who can pay more than cost. Thus it allows the firm to bring the poor into the market. After antitrust has stepped in to reduce a firm's power over price, firms will retain the ability and incentive to maximize profit by selling to all consumers who are willing to pay at least the cost of production. Antitrust merely deprives firms of the power to redistribute wealth to themselves by charging the highest possible prices to each consumer. By contrast, regulations that limit the use of technology prevent firms from tailoring prices altogether, eliminating the advantage of technology, as well as its disadvantage.

## **V. CONCLUSION**

The principal threat of technology to antitrust operates through the second dimension of power, rather than market power. By making it easier for firms to tailor prices to consumers, and to exert psychological pressure on them to buy through tailored marketing, technology will allow firms to extract more wealth from consumers for any given level of market power, upsetting the distribution of wealth between consumers and producers that antitrust has sought to guarantee through the regulation of market power alone. Technology does not help consumers to fight back on their own because it does not solve the problem of consumer organization that is a prerequisite for the use of technological countermeasures. Antitrust can restore the balance between consumer and producer surplus by using reductions in market power to counteract the effects of increased power in the second dimension. These reductions in market power may be achieved by returning to the more vigorous antitrust enforcement of the mid-20<sup>th</sup> century or embracing a deconcentration campaign that would include oligopoly as a target. Antitrust can also counteract the effects of increased second-dimension power directly by promoting competition in the intrabrand market or promoting decentralization of pricing authority within firms.

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<sup>25</sup> For a more detailed discussion of this option, see Ramsi A. Woodcock, *Competition within Firms as a Substitute for Competition between Firms* (2017) (unpublished manuscript).



# WHEN ANTITRUST BECOMES PRO-TRUST: THE DIGITAL DEFORMATION OF U.S. COMPETITION POLICY

BY FRANK PASQUALE<sup>1</sup>



## I. INTRODUCTION

There is a delicate balance between consolidation and competition in any industry. In theory, mergers and acquisitions can allow firms to achieve economies of scale and scope.<sup>2</sup> However, when concentration reaches a certain level, two distinct anti-competitive effects can emerge. First, within an industry, firms may feel pressure to grow simply to keep up with rivals. (When, for instance, the top two firms in an industry merge, the third largest one may quickly search out possible acquisition targets to keep up.) Second, the largest firm or firms in a very concentrated sector may use their pricing power to earn profits that allow them to expand outside the sector and take over firms in adjacent sectors.

In digital industries in particular — such as search engines and social networks — U.S. merger review has been lax. Authorities wave through acquisition after acquisition, assuming that the organization of online life by a small group of behemoth firms is part of the natural order of the digital economy. The less serious among them continue to insist that, at any moment, a few kids in a garage could whip up an innovation capable of toppling firms with hundreds of thousands of servers, tens of thousands of employees, gargantuan patent portfolios and self-reinforcing advantages in data collection based on years of intimate profiling of persons and IP addresses. Others soberly acknowledge that the centripetal accumulation of data, money and power at massive technology firms is likely to be indefinite, but say that precedent keeps them from doing more to address unilateral action.<sup>3</sup>

Years ago, U.S. authorities were at least trying to think through what a

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1 Professor of Law, Francis King Carey School of Law, University of Maryland.

2 This theory of mergers has been largely debunked empirically. John Kwoka, *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U.S. Policy* (MIT Press, 2014).

3 Scholars have contested this inertial quiescence. See, e.g. Sandeep Vaheesan, *A Comprehensive Charter of Economic Liberty*, 19 U. Pa. J. Bus. L. 445, 451 (2017), draft available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2830702](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2830702) (demonstrating that the FTC has latitude to interpret the relevant statutes to enable a more realistic approach to digital firms' market power).

constructive response to powerful technology platforms might look like. The Department of Justice (“DoJ”) required Google to license ITA’s software on non-discriminatory terms, and the Federal Trade Commission (“FTC”) forced Google’s CEO off Apple’s Board, and eventually investigated its core business. However, the FTC suddenly closed its investigation at the beginning of 2013.<sup>4</sup> Since then it has taken a curious turn toward trying to help Google and other massive digital platforms to consolidate market power, rather than policing them. For example, the agency has deployed extraordinary resources in the *1-800-Contacts* litigation, casting Google as a heroic promoter of consumers’ interests as it drops the hammer on a firm that tried to avoid bidding wars on search terms.<sup>5</sup> The FTC has had far less interest in complaints that Google itself was harming consumers with its selection and arrangement of content.<sup>6</sup> It has also vigorously policed municipalities which try to regulate Uber, while devoting little effort to stopping Uber’s own anti-competitive, privacy-violating practices.<sup>7</sup>

Nor has the DoJ’s intervention in the Apple e-books case stood the test of time, given how studiously the DoJ has ignored evidence of Amazon’s own anti-competitive acts.<sup>8</sup> Rather than shaping antitrust law to accommodate the publishers’ efforts to mollify the effects of Amazon’s increasingly monopolistic power over book sales, the DoJ stuck with a formalistic approach, smothering an alternative in the cradle as a *per se* violation of competition law.<sup>9</sup> This speedy action was also an odd fit with the usual caution among antitrust enforcers in technology fields, where lethargy is their *métier*.

Massive digital platforms have thus exacerbated an old problem in American antitrust law — the tension between the efficiencies that mergers achieve in theory, and the pressure they inevitably create for firms in, or adjacent to, the industry of the merged firms, to themselves combine in order to better compete. But U.S. antitrust authorities have, by and large, refused to address this dynamic. They have instead clung to three myths to rationalize market power online:

1) **The Myth of Easy Platform Switching:** Consumers can and will easily shift from Google to Yahoo, or from Amazon to Barnes & Noble, or from Uber to Lyft.

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4 Frank Pasquale, *Paradoxes of Digital Antitrust: Why the FTC Failed to Explain Its Inaction on Search Bias* (Harvard Journal of Law & Technology Occasional Paper Series, July 2013), [http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2437&context=fac\\_pubs](http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2437&context=fac_pubs).

5 Eric Goldman, *FTC Explains Why It Thinks 1-800 Contacts’ Keyword Ad Settlements Were Anti-Competitive*—FTC v. 1-800 Contacts, Tech. & Marketing L. Blog (Apr. 18, 2017), <http://blog.ericgoldman.org/archives/2017/04/ftc-explains-why-it-thinks-1-800-contacts-keyword-ad-settlements-were-anti-competitive-ftc-v-1-800-contacts.html>. Perhaps the FTC would be happier if 1-800-Contacts bought its competitors — then no collusion would be occurring. Or, if it blocked that merger and left the firm to be predated on by online intermediaries, perhaps the FTC sees the logical and appropriate conclusion of search dominance to be gradual purchase of firms like 1-800 Contacts by firms like Google, which has the resources to conglomeratize Alphabet further by adding, say, a contact lens division. See, e.g. Brian Otis and Babak Parviz, *Introducing our smart contact lens project*, Google Blog, Jan. 16, 2014, at <https://googleblog.blogspot.com/2014/01/introducing-our-smart-contact-lens.html>. Note, too, that I am not taking a position here on the FTC’s legal position in *1-800 Contacts* — I just want to observe that the decision to devote limited enforcement resources here, rather than to policing dominant technology firms, speaks volumes about the FTC’s crabbed and formalistic vision of its role in consumer protection and competition promotion.

6 Where Google fails to comply with the law, the FTC appears to favor weak and vague guidances, rather than litigation. See, e.g. Danny Sullivan, *FTC Updates Search Engine Ad Disclosure Guidelines After “Decline In Compliance,”* Search Engine Land, June 25, 2013, at <http://searchengineland.com/ftc-search-engine-disclosure-164722> (reporting that the associate director for advertising practices at the FTC “stressed that none of the FTC’s guidance is meant to be absolutely specific. The guidance is offered as general recommendations.”).

7 Compare Paul Merion, *FTC Warns Chicago: Don’t Let Ride-Sharing Regs Hurt Competition*, Crain’s (Apr. 21, 2014), <http://www.chicagobusiness.com/article/20140421/NEWS02/140429966/ftc-warns-chicago-dont-let-ride-sharing-regs-hurt-competition>, with Mike Isaac, *Uber’s CEO Plays with Fire*, N.Y. Times (Apr. 23, 2017), <https://www.nytimes.com/2017/04/23/technology/travis-kalanick-pushes-uber-and-himself-to-the-precipice.html?mtrref=t.co&g-wh=8425469DD3CEBE3A71807E8266DD5B0A&gwt=pay>. Note that the FTC’s settlement with Uber (for misleading advertising to potential drivers) was so small in comparison to the company’s resources that it is unlikely to have much of a deterrent effect. Press Release, FTC, *Uber Agrees to Pay \$20 Million to Settle FTC Charges that It Recruited Prospective Drivers with Exaggerated Earnings Claims* (Jan. 19, 2017), <https://www.ftc.gov/news-events/press-releases/2017/01/uber-agrees-pay-20-million-settle-ftc-charges-it-recruited>.

8 Maurice E. Stucke & Ariel Ezrachi, *The E-Scraper and E-Monopsony*, OXFORD BUS. L. BLOG (APR. 10, 2017), <https://www.law.ox.ac.uk/business-law-blog/blog/2017/04/e-scraper-and-e-monopsony>; LINA KHAN, *AMAZON’S ANTITRUST PARADOX*, 126 YALE L.J. 710 (2017); *MODERN MONOPOLISTS ARE REDEFINING COMPETITION*, FINANCIAL TIMES (APR. 21, 2017), <https://www.ft.com/content/b7214b26-2660-11e7-a34a-538b4cb30025> (noting how rational it is for platform monopolists to pursue predatory pricing).

9 They also ignored scholarly work demonstrating that a credible threat of predation from Amazon is likely to deter funding for online retail ventures. See Sandeep Vaheesan, *Reconsidering Brooke Group: Predatory Pricing in Light of the Empirical Learning*, 12 BERKELEY BUS. L.J. 81 (2015).

2) **The Myth of the Heroic Consumer:** Consumers will be constantly vigilant against exploitative practices by digital platforms. They compare prices and quality constantly, multihoming to maximize their chances of finding the best deals.

3) **The Myth of Platforms Perfecting Markets:** Platforms must be given free rein to sell goods and services with as little resistance from sellers or laborers as possible. A two-sided or multi-sided market will continually drive down the prices that sellers are willing to accept, and the prices consumers must pay, while maintaining or improving quality.

It is critical to debunk these three myths now, before they deform competition law beyond recognition.

## II. THE MYTH OF EASY PLATFORM SWITCHING

To many antitrust enforcers, search engines like Yahoo, Google and Bing all look roughly similar. If users or advertisers do not like something Google does, they can simply switch to another search engine. Social networking appears to be a highly unstable market, where Facebook's dominance could be lost in an instant once Snapchat or Instagram (at least until it was bought by Facebook) attract a critical mass of users. Amazon, too, is just one click away from being "disrupted" by a sufficiently tech-savvy WalMart.com, or some disruptive e-commerce site coded by a college drop-out in a garage. But each of these examples belies the complexity of online innovation.<sup>10</sup>

Consider, first, the example of Google search. The search engine is increasingly integrated into a wide array of services, ranging from YouTube to maps to calendaring. Signed-in users may accumulate a years-long history of thousands of searches. Their behavior in response to each search engine results page helps train machine learning algorithms to further personalize and improve results.<sup>11</sup> Even for those who are not signed in, a history of searches from an IP address may also advance personalization. Transferring such histories to train other search engines to personalize results is not an easy process — indeed, it is well-nigh impossible for typical users. So the switch from Google to another search engine is by no means costless.<sup>12</sup>

For social networks, lock-in should be even more obvious. A user fed up with Facebook's privacy violations, balky newsfeed and intrusive tracking may decide that he does not want to use Facebook any longer. But breaking up is hard to do. He may have to download and re-upload his pictures to Path, Line, MySpace or some other social network. Comments and other communications may be lost. If he has used Facebook's OAuth capability on many third-party services, he may have to go through a laborious process of re-authenticating his identity on each of them.<sup>13</sup>

Even if he completes all these tasks, good luck to him if he tries to persuade a critical mass of friends to follow him to his new online home. Coordination problems are nearly insurmountable. Antitrust enforcers miss these dynamics when they permit Facebook to acquire a firm like Instagram on the logic that Photobucket, Flickr or Imageshack are alternative photo sharing sites. Users want to post to their networks — and they are not all that interested in multi-site posting services (assuming such services would even be able to interoperate with dominant platforms). And finally, even if he does manage to break the Facebook habit, that will not stop the company from tracking him across a large number of websites.

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10 Frank Pasquale, *Internet Nondiscrimination Principles: Commercial Ethics for Carriers and Search Engines*, 2008 U. Chi. Legal F. 263. Moreover, those who favor network neutrality should realize that platforms have the same troubling incentives (including exclusion, rent-seeking and marginalization) toward downstream third-party innovation as ISPs do. Recent arbitrary decisions about eligibility for monetization at YouTube dramatize that concern. JONATHAN TAPLIN, *MOVE FAST AND BREAK THINGS: HOW FACEBOOK, GOOGLE, AND AMAZON CORNERED CULTURE AND UNDERMINED DEMOCRACY* (2017).

11 Frank Pasquale, *Privacy, Antitrust, and Power*, 20 Geo. Mason L. Rev. 1009 (2013); Ian Leslie, *The Scientists who make Apps Addictive*, Economist (1843 Magazine), at <https://www.1843magazine.com/features/the-scientists-who-make-apps-addictive> (describing how big data-driven personalization is an increasingly essential part of compelling platforms).

12 See also Frank Pasquale, *Seven Reasons To Doubt Competition In The General Search Engine Market*, Madisonian Blog, at: <http://madisonian.net/2009/03/18/seven-reasons-to-doubt-competition-in-the-general-search-engine-market/> (March 18, 2009).

13 John Koetsier, *Facebook Just Took A Giant Leap To Becoming The Global Password Manager For Web And Apps*, Forbes, at <https://www.forbes.com/sites/johnkoetsier/2017/04/18/facebook-just-took-a-giant-leap-to-becoming-the-global-password-manager-for-web-and-apps/#69cb96e71f3c>.



Note, too, that most users are unlikely even to be able to detect ways in which search engines or social networks betray their interests. Few have the time or interest to monitor the constant creep of privacy policies toward uncompensated, unconsented data grabs. Very few, if any, users are likely to search again for a desired object on another search engine once they have an acceptable result from Google. And what might happen if a user decided to demand better or different terms of service from Google or Facebook, by, say, sending a counter-offer that detailed the user's willingness to pay for certain privacy protections, or for a certain structure for his or her search results or newsfeed? If such an offer actually reached a person at such a company, it would likely be laughed at and ignored. More likely, it would simply be routed to some computational dead-end, provoking little more than an automated response. Thus our relationships with such firms are not even contractual in nature. Rather, they govern zones of our conduct with a power and absoluteness that many government agencies would envy.

Finally, with respect to Amazon, whatever hopeful vision of competition may be conjured by antitrust scholars, the brutal realities of high-volume, low-margin digital retailing are likely to kneecap would-be competitors for years or decades to come. However brilliant a garage innovator may be, she cannot code tens of thousands of supplier arrangements, or the rich data banks that Amazon has accumulated for millions of customers. And why would customers desert Amazon's platform for another, less comprehensive online retailer? Perhaps venture capitalists will find the perfect rival someday, and invest millions of dollars in trying to get customers to switch. More likely, though, investors will continue to bet on Amazon's massive and growing dominance of this space.

### III. THE MYTH OF THE HEROIC CONSUMER

A few years ago, I discussed the competition law problems raised by Uber with a group of Washington, D.C. policy experts. Almost to a person, they could not see a problem caused by the company — even after I mentioned sharp practices against their smaller rival, Lyft.<sup>14</sup> The cognoscenti insisted that so many taxi apps were available (Lyft, Hailo and more) that whatever dominance Uber might build in a market was likely to be temporary. Charge too high a fare, or pay drivers too little, and another platform would swoop in and compete away the excess profits.

While a lovely just-so story about the nature of digital competition, this projection rests on a faulty foundation: model consumers zealously scanning online marketplaces for cheaper services. If consumers' main activity in life were looking for rides, of course they would spend a great deal of time searching out the best deals and experimenting with alternative apps. But we all have many things to do. Many times, when we are searching for a ride, we are pressed for time. It is simply not worth rolling the dice on an alternative service when such an effort could mean missing an appointment, first date, train, or flight. Moreover, there is a classic collective action problem: the possibility of saving, say, three dollars or so by shopping, is not worth the time for most individuals, even if such diligence would save millions of dollars once aggregated. Contrary to economists' assumptions, consumers in many markets have neither the time nor the interest in engaging in diligent comparison shopping. This mechanism that, in theory, drives inter-firm competition on price and other terms is weak or non-existent in many markets.

In many other industries, consumer groups can help individuals determine whether they are being cheated or not. However, digital platforms are notoriously secretive about their data and algorithms. As Christian Sandvig has observed, even academic research on such platforms may, in certain instances, be deemed a criminal act, given unpredictable interactions between terms of service and the CFAA. This secrecy has led competition law researchers Ariel Ezrachi and Maurice Stucke to suggest that our life online is something of a digital *Truman Show*, where we can have little if any chance of truly understanding how our choices are structured and manipulated by opaque AI methods.<sup>15</sup>

Antitrust authorities should also acknowledge that consumers are often using platforms as a source of information about other services, rather than as finished services themselves. As Mark Patterson observes in his *Antitrust in the New Economy*, such informa-

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<sup>14</sup> At the time, it was: Erica Fink, *Uber's Dirty Tricks Quantified: Rival Counts 5,560 Canceled Rides*, CNN Tech (Aug. 12, 2014), <http://money.cnn.com/2014/08/11/technology/uber-fake-ride-requests-lyft/>. Now, it is: Riley McDermid, *Uber Used "Hell" Software to Track Lyft and Lure Its Drivers*, San Fran. Bus. J. (Apr. 13, 2017), <http://www.bizjournals.com/sanfrancisco/news/2017/04/13/uber-track-lyft-drivers.html>. One has to wonder whether U.S. authorities might even frame such practices as pro-competitive, given their apparently unshakeable belief in platform monopolizers as consumer-welfare-maximizing phenomena.

<sup>15</sup> Ariel Ezrachi & Maurice E. Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (2016).

tion cannot be treated as an ordinary finished good or service in economic theory.<sup>16</sup> It is part of the basic inputs necessary to make a market work well. We would not allow a school to simply sell grades to the highest bidder. But we have little sense of exactly what commercial relationships are influencing online platforms' selection and arrangement of options in response to our search queries. Without that kind of knowledge, consumers cannot even manage the most basic supervision of megaplatforms, let alone the heroic level of scrutiny, experimentation and activism that would be necessary to make neoliberal theories of platform competition plausible.

#### IV. THE MYTH OF PLATFORMS PERFECTING MARKETS

Too many antitrust enforcers presume that digital platforms constitute an optimal structure for markets. They seem to envision a utopic future where every provider of a good or service competes against all others on a digital exchange as fast-paced, standardized and information-packed as algorithmic stock trading platforms.<sup>17</sup> On this Hayekian view, the market is fundamentally an information processor, finding optimal matches between buyers and sellers. Platforms create reputations for sellers, and help buyers search for the optimal mix of price and quality.<sup>18</sup>

In fashionable neoliberal economic theory, the frictionless platform is lionized as a universal solvent for insurance and safety regulations and occupational licensure rules. Thus the FTC has aggressively warned cities not to harm "competition" by imposing certain rules on transport platforms like Uber. It has also "advised" states not to impose certain professional responsibility rules on platforms like LegalZoom. Behind these and similar actions lie a vision of universal, standardized, barely regulated competition for precarious work as a way of driving down wages. The agencies appear to be suspicious not merely of exclusionary actions by professional associations of the type at issue in *North Carolina Dental*, but of any self-governance or stability mechanisms in workplaces not explicitly protected pursuant to the NLRA.

By largely ignoring the anti-competitive and anti-consumer practices of major platforms, while focusing regulatory attention on the likes of ice skating coaches and church organists, the FTC has reinvented itself as an "Anti-Labor Department."<sup>19</sup> The DoJ's decision to police "heir location services" adds an even more plutocratic flair to antitrust enforcers' repeated decisions to pour resources into scrutinizing workers' belated and weak efforts to promote stable employment, rather than critically examining technology and finance firms' massive influence structuring the commanding heights of the economy.<sup>20</sup>

The question raised by such initiatives is: why not impose platform labor conditions on the attorneys and economists at the FTC and DoJ themselves? If they truly believe in frictionless labor markets, they should devise plans to reverse auction their own positions on a yearly (or perhaps even monthly) basis, opening their jobs to competition by other workers, who might be willing to do the same work for less pay. Jared Kushner's Office of American Innovation, designed to fundamentally redesign bureaucratic processes, would likely be interested in such a proposal. Perhaps he can revive Al Gore's National Partnership for Reinventing Government to implement it.

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16 Mark R. Patterson, *Antitrust in the New Economy: Google, Yelp, LIBOR, and the Control of Information* (2017).

17 For a description of such platforms, see Frank Pasquale, *Law's Acceleration of Finance: Redefining the Problem of High-Frequency Trading*, 36 *CARDOZO L. REV.* 2085 (2015).

18 For more on the digital economy as a problem of reputation and search, see FRANK PASQUALE, *THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION* (2015).

19 Sandeep Vaheesan & Frank Pasquale, *The Politics of Professionalism*, *ANN. REV. L. & SOC. SCI.* (forthcoming 2017), draft available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2881732](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2881732).

20 Compare Press Release, U.S. Dep't of Justice, *First Charges Brought in Investigation of Collusion Among Heir Location Services Firms* (Dec. 23, 2015), <https://www.justice.gov/opa/pr/first-charges-brought-investigation-collusion-among-heir-location-services-firms>, with Einer Elhauge, *Horizontal Shareholding*, 129 *HARV. L. REV.* 1267 (2016), which appears to have inspired almost no concrete action by the agencies (though Bill Baer did recognize the importance of Elhauge's work in a March, 2016 meeting of the Senate Judiciary Committee's Subcommittee on Antitrust, Competition Policy and Consumer Rights). See *Oversight of the Enforcement of the Antitrust Laws: Hearing Before the Subcomm. on Antitrust, Competition Policy and Consumer Rights of the S. Comm. on the Judiciary*, 114th Cong. (Mar. 9, 2016) (testimony of Bill Baer, Ass't Att'y Gen., Dep't of Justice Antitrust Div.), <https://www.judiciary.senate.gov/imo/media/doc/03-09-16%20Baer%20Testimony.pdf>.

Staff and management will surely protest that such disruption would require them to fundamentally change workflows, continually documenting their projects so that new workers could take them up. But under the same logic of platform promotion that the FTC and DoJ have been advocating, that would be a positive, not a negative, change. Fragmenting tasks into small chunks that can be standardized and repeated is a key tenet of Taylorist management practices and efficiency maximization. So if the FTC and DoJ want to continue to scrutinize professional associations and worker-protective legislation, they should first prioritize challenges to their own workers' and managers' security of position. Unless they are willing to come out against civil service protections for themselves, they appear little different than the dentists and other professional associations they have been attacking for decades.

## V. TWO BIPARTISANSHIPS IN ANTITRUST LAW

Of course, I make the suggestions in the last two paragraphs in jest — no reasonable person would want to see TaskRabbit take over the Office of Personnel Management and the Merit Systems Protection Board. But I raise the possibility because U.S. antitrust agencies' continual solicitude to digital megaplatforms, and intense policing of labor cooperation, raise critical questions about the future of American competition policy. Indeed, they raise the question of whether the Antitrust Division and Bureau of Competition do more to help the economy than they do to harm it.

There are, at present, two forms of bipartisanship in U.S. competition policy circles. Neoliberal technocrats portray antitrust as, at bottom, a realm of economic models occasionally informed by econometric analysis. While a pluralistic technocracy would be open to input from many forms of social science and schools within economics, neoliberal technocrats in antitrust primarily rely on Chicago School theory, occasionally tweaked to reflect insights from behavioral economics. They repeat that antitrust authorities must “protect competition, not competitors,” like a mantra. This perspective celebrates the growing power of platform monopolists, characterizing it as the natural return to merit. Perhaps hard-pressed to find something for antitrust authorities to do once megafirms' power is no longer their concern, neoliberal technocrats naturally turn their attention to rearguard actions among laborers to stabilize their conditions of employment. They scrutinize any agreement among workers or professionals to set standards in their field as a potential distortion of market competition. This neoliberal technocrat perspective is so commonly shared among elites in Washington that few commentators expect serious changes in competition policy as Trump's political appointees replace Obama's.

However, another, more populist, bipartisanship is now emerging in discussions of corporate power.<sup>21</sup> It is an alliance of libertarian Republicans and Occupy Democrats who find the DoJ and FTC hopelessly out of touch with current economic realities. Populists sincerely wonder how we are to determine whether competition is real when there are no real competitors to provide it. They do not believe that \$1,000-an-hour expert witness economists are guardians of the public interest.<sup>22</sup> And if the FTC and DoJ continue to shirk their duties to police truly dominant firms, populists may well decide to defund them, and let states develop competition policy to fill a vacuum in leadership already apparent at the national level.

Neither of these forms of bipartisanship is appealing to me. But it is time for technocratic antitrust enforcers to realize that their manifest failure to address consolidation in digital industries, finance and beyond, invites a populist backlash. They need to address the work of thinkers like Adam Candeub, Ariel Ezrachi, Allen Grunes, Sally Hubbard, Lina Khan, Barry Lynn, Nathan S. Newman, John M. Newman, Mark Patterson, Matthew Stoller, Zephyr Teachout, Sandeep Vaheesan and Ramsi Woodcock, among others.<sup>23</sup> They need to police concentrations of capital as intensely as they monitor labor cooperation. And they need to do so quickly, lest their current biases congeal into patterns and practices that discredit their field.

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21 This populism is a form of the “counternarrative” I describe in a recent piece on platforms. Frank Pasquale, *Two Narratives of Platform Capitalism*, 35 *YALE L. & POL'Y REV.* 309 (2016).

22 Jesse Eisinger & Justin Elliott, *These Professors Make More Than a Thousand Bucks an Hour Peddling Mega-Mergers*, *PROPUBLICA* (Nov. 16, 2016), <https://www.propublica.org/article/these-professors-make-more-than-thousand-bucks-hour-peddling-mega-mergers>.

23 See, e.g. BARRY C. LYNN, *CORNERED: THE NEW MONOPOLY CAPITALISM AND THE ECONOMICS OF DESTRUCTION* (2011); MAURICE STUCKE & ALLEN GRUNES, *BIG DATA AND COMPETITION POLICY* (2016); Sally Hubbard, *As EU Continues Scrutiny of US Tech Giants, Amazon is Increasingly Vulnerable in US to Antitrust Enforcement for Exclusionary Conduct in Books*, *Capitol Forum*, at <http://createsend.com/t/j-3B6A398601C6EAE5>; John M. Newman, *Antitrust in Zero-Price Markets: Applications*, 94 *Wash. U. L. Rev.* 49 (2016); Nathan Newman, *Search, Antitrust, and the Economics of the Control of User Data*, 31 *Yale J. on Reg.* 401 (2014); Zephyr Teachout, *Corporate Rules and Political Rules: Antitrust as Campaign Finance Reform* (Fordham Law Legal Stud. Res. Paper No. 2384182, Jan. 2014), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2384182](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2384182); Ramsi Woodcock, *Inconsistency in Antitrust*, 68 *U. Miami L. Rev.* 105 (2013); Adam Candeub, *Behavioral Economics, Internet Search, and Antitrust*, 9 *IS: J.L. & Pol'y for Info. Soc'y* 407 (2014).

# COMPLEX ANTITRUST HARM IN PLATFORM MARKETS

BY JOHN M. NEWMAN<sup>1</sup>



*Two years ago, we accelerated the consolidation of the online real estate media category by acquiring our closest competitor, trulia. . .*

—Spencer Rascoff, CEO, Zillow Group<sup>2</sup>

## I. INTRODUCTION

Markets evolve. Constant innovation is both a fact of life and a do-or-die mandate for modern firms. And antitrust law — with its own mandate of safeguarding competition — tries to keep up. At the turn of the millennium, the antitrust enterprise underwent an intense bout of soul-searching, prompted in large part by the high-profile *Microsoft* litigation. Was antitrust doctrine — much of it developed in a bygone era of smokestack industries — appropriately designed for use in software markets?<sup>3</sup> Writing in 2000, Richard Posner provided what has become the consensus answer: “antitrust doctrine is supple enough . . . to take in stride the competitive issues presented by the new economy.”<sup>4</sup>

More than a decade later, antitrust doctrine finds itself again confronting a “new economy.” Computers fit into pockets and can be worn as eyeglasses. Software applications — and, indeed, computing itself — are increasingly delivered as a service, rather than installed as a product.<sup>5</sup> The concerns about desktop-computer operating systems that motivated *Microsoft* appear ever more quaint in the Twenty-first Century. Is antitrust doctrine “supple enough”

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<sup>2</sup> Zillow Group, Q4 Prepared Remarks (Feb. 7, 2017), available at: <http://investors.zillow-group.com/financials.cfm#results>.

<sup>3</sup> E.g. *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

<sup>4</sup> Richard A. Posner, *Antitrust in the New Economy*, 68 ANTITRUST L.J. 925 (2000).

<sup>5</sup> Damon C. Andrews & John M. Newman, *Personal Jurisdiction and Choice of Law in the Cloud*, 73 Md. L. Rev. 313, 325 (2013).

to address manipulation of search results?<sup>6</sup> Algorithm-based collusion?<sup>7</sup> Markets involving “free” digital products?<sup>8</sup>

As markets become more complex, competitive harm can also become more complex. Of course, not every market evolution facilitates new types of harm. The advent of pricing algorithms, for example, paved the way for a novel *means* of horizontal collusion. Advances in artificial intelligence may further increase the likelihood of such collusion.<sup>9</sup> But the resulting anticompetitive *effects* — higher prices and lower output — have long been familiar to antitrust.

Some evolutions do, however, create less familiar avenues for harm. In many markets, the number of sellers and variety of consumer products have reached dizzying heights. Accordingly, *reputation* has become a primary facet of competition. In an age of information abundance and overload, reputation offers a necessary means for consumers to distinguish signals from noise. Platforms that compile, curate and display reputational information have emerged as focal points in the “new” new economy.

Platform markets exhibiting substantial algorithm-driven reputation competition can facilitate a unique type of competitive harm. This article briefly summarizes the marketplace evolutions that have fiercely intensified such competition. It then describes this novel second-order, out-of-market competitive harm that can arise as a result of certain conduct in such markets. The consummated acquisition of online real-estate listing service Trulia by Zillow, its primary rival, illustrates how such harm might occur in practice. Post-deal statements from the combined firm’s executives suggest the Zillow–Trulia acquisition may have harmed — indeed, may be harming — consumers. The FTC’s antitrust review, which cleared the acquisition without condition, may have missed the mark. If Posner’s observation is to continue to hold true, antitrust doctrine must evolve to meet the new challenges posed by such conduct.

## II. REPUTATION AND POWER

The major innovations that characterize the early Twenty-first Century center on information: its production, organization, dissemination and consumption. The result has been a stark increase in the quantity and variety of information that is available. One might reasonably have expected these developments to cure the informational problems that often create suboptimal outcomes.<sup>10</sup> Indeed, many predicted as much.<sup>11</sup> Yet in some ways, the opposite happened. Information abundance became information overload. Information-centric competition proved to be less-than-perfect. From this tumult, reputation emerged as a powerful filtering tool. As such, it can be used as a shield by consumers — but also wielded as a sword by powerful platforms.

### A. Information Abundance

The convergence of digital computing and networking was perhaps the single most important event in the evolution of IT. By drastically lowering the marginal costs of information reproduction and distribution, the Internet serves as a “giant copying machine.” Throughout much of history, information was scarce, a precious and carefully guarded resource. Today, information is relatively abundant. It is often offered at costs so low that many analysts and courts have, albeit mistakenly,<sup>12</sup> called it “free.”

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6 See, e.g. James D. Ratliff & Daniel L. Rubinfeld, *Is There a Market for Organic Search Engine Results and Can Their Manipulation Give Rise to Antitrust Liability?*, 10 J. COMP. L. & ECON. 517 (2014).

7 Salil K. Mehra, *Antitrust and the Robo-Seller: Competition in the Time of Algorithms*, 100 MINN. L. REV. 1323 (2016); MAURICE E. STUCKE & ARIEL EZRACHI, *ARTIFICIAL INTELLIGENCE AND COLLUSION: WHEN COMPUTERS INHIBIT COMPETITION* (UNIV. OF TENN. COLLEGE OF LAW, RESEARCH PAPER #267).

8 See, e.g. John M. Newman, *Antitrust in Zero-Price Markets: Foundations*, 164 U. PA. L. REV. 149 (2015); SALIL MEHRA, *COMPETITION LAW FOR A POST-SCARCITY WORLD* (TEMPLE UNIV. LEGAL STUDIES, RESEARCH PAPER No. 2016-13).

9 See, e.g. Maurice E. Stucke & Ariel Ezrachi, *How Pricing Bots Could Form Cartels and Make Things More Expensive*, HARV. BUS. REV. (OCT. 27, 2017), <https://hbr.org/2016/10/how-pricing-bots-could-form-cartels-and-make-things-more-expensive>.

10 MARK R. PATTERSON, *ANTITRUST LAW IN THE NEW ECONOMY: GOOGLE, YELP, LIBOR, AND THE CONTROL OF INFORMATION* 1 (2017).

11 See John M. Newman, *The Myth of Free*, 87 GEO. WASH. L. REV. (FORTHCOMING 2017) (MANUSCRIPT AT 24).

12 Id. (manuscript at 1–2).

But the rising tide of information has quickly become a flood. Given their scarce time and cognitive load, consumers do not always react to abundant information as a neoclassical model might predict. More information creates more choices, but — counterintuitively — the availability of more choices does not always produce better outcomes. For example, advances in IT made it (theoretically) possible for a prospective home-buyer to access information about every available real-estate listing, past sales price and tax information for each property listed, every real-estate agent currently offering services, etc. Actually attempting to make choices based on all of this information, however, would be like trying to drink from a fire hose.

Antitrust doctrine generally treats “consumer choice” as a positive. Courts have recognized “greater consumer choice” as a valid procompetitive justification.<sup>13</sup> Yet the antitrust enterprise has not fully grappled with the “paradox of choice”: a larger assortment of choices can cause consumers to make less optimal decisions.<sup>14</sup> Additional information regarding choices “can confuse consumers, increasing the probability of delaying their choice or not choosing at all.”<sup>15</sup>

The downsides of information abundance — which can be experienced instead as information overload — prompted the rise of services that compile and refine information into a more useful “finished” product. In the past, collection and production were often the most valuable roles played by information providers. In an age of information abundance, it is the curation and refining — or, put another way, the “filtering” — of information that have become most valuable. Information providers have taken on more of a gatekeeper role in modern markets.<sup>16</sup>

## **B. Information Competition**

Many prominent new products constitute information itself. Providers of online search do not provide information in order to sell products — search itself is the product.<sup>17</sup> One particularly prevalent business model that emerged was the platform: an online application that would connect sellers and buyers via a matching system. Such platforms do not sell the product buyers ultimately seek; instead, the platform’s content itself is a product, the demand for which is derived from demand for the related product users ultimately seek.

Uber, for example, does not sell “private driver services.” Uber “sells” its mobile application, which displays information to drivers and riders seeking to connect with each other. Zillow Group does not sell homes, or even real-estate agent services — it “sells” its search platform to users, and its users’ attention to advertisers. Even Amazon, which initially adopted a more familiar top-down distribution system, subsequently launched “Marketplace,” which functions as an intermediary platform that provides information to facilitate transactions between consumers and third-party sellers.

Upon first glance, such platforms may appear likely to drastically increase the number of sellers in the immediately related product market. Uber (and its primary rival, Lyft), for example, drastically increased the number of competing providers of private-driver services. All else being equal, then, such platforms might seem to mitigate, rather than facilitate, the exercise of market power.

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13 See, e.g. *NCAA v. Bd. of Regents of Oklahoma*, 468 U.S. 85 (1984) (“[The NCAA’s] actions widen consumer choice . . . and hence can be viewed as procompetitive.”); *Wisconsin Music Network, Inc. v. Muzak Ltd. Partnership*, 5 F.3d 218, 223 (7th Cir. 1993) (crediting a type of blanket-licensing arrangement for reducing transaction costs, thereby “increas[ing] consumer choice”). Some scholars have argued that “consumer choice” should become the new antitrust paradigm. See Neil W. Averitt & Robert H. Lande, *Using the “Consumer Choice” Approach to Antitrust Law*, 74 ANTITRUST L.J. 175 (2007).

14 E.g. Alexander Chernov, *When More Is Less and Less Is More: The Role of Ideal Point Availability and Assortment in Consumer Choice*, 30 J. CONSUMER RES. 170 (2003).

15 *Id.*

16 PATTERSON, SUPRA NOTE 10, AT 37.

17 *Id.* at 35. This is, of course, not universally true. A “general search” provider might conceivably provide search results that feature prominently its own vertically integrated products in order to “sell” those products to users.

Yet that is not always the case. As others have argued, the economics of information may favor large incumbents. Fixed costs that are high relative to marginal costs,<sup>18</sup> network effects<sup>19</sup> and path dependency all, to varying degrees, may cause information-centric markets themselves to tend toward concentration rather than competition. In other words, while Uber may allow more drivers to compete to provide private-driver services, that possibility alone would not prevent Uber itself from exercising market power in the taxi-platform market. Moreover, as this article suggests, neither would that possibility necessarily prevent the build-up of market power in the underlying market for private-driver services.

### ***C. The Power of Reputation***

Reputation has emerged as one of the most vital facets of competition in many modern markets.<sup>20</sup> Uber, Yelp, Google Maps, Amazon — all of these platforms either incorporate or (in the case of Yelp) essentially comprise a reputational mechanism. Buyers faced with myriad sellers avoid “drinking from a fire hose” at least in part by focusing on reputation. One prevalent mechanism is a star system that allows customers to rate suppliers by assigning a number (usually between one and five) of stars. Many platforms appear to assign substantial competitive significance to their reputational mechanisms. Both Uber and Lyft have been known to “de-activate” drivers whose rating drops below a set cutoff point.<sup>21</sup>

Reputational mechanisms are so vital to these platforms because of their filtering function. A consumer seeking to purchase common home goods from Amazon’s Marketplace, for example, might confront dozens, hundreds, or even thousands of similar sellers offering similar products. Amazon’s star system offers a way to cut through this thicket.

These mechanisms function via underlying algorithms. Amazon’s product-search results appear to be ordered, at least in part, by seller reputation. Amazon also offers consumers the capability of explicitly filtering out products from sellers whose star ratings are not satisfactory. Many other platforms offer similar algorithmically delivered search results and filtering capabilities. Reputational mechanisms are one way modern platforms refine information into valuable finished products.

### ***D. Complex Harm: Theory***

The antitrust enterprise may be overlooking complex harm in platform markets wherein reputation plays a vital competitive role. As an initial matter, antitrust analysts have only recently started grappling in earnest with the unique attributes of multi-sided platforms. Adding further complexity, in online markets, many products are seemingly offered to consumers for “free.” This phenomenon has misled courts and enforcers into giving suppliers of “free” products a “free pass” from antitrust liability. Beyond all of this, as the recent Zillow–Trulia acquisition suggests, the rise of reputation-driven platform markets may open up a novel avenue for competitive harm.

Many online platforms bring together advertisers and consumers, with the latter often being lured in by the offer of a discretely valuable product.<sup>22</sup> *BuzzFeed*, for example, attracts reader–consumers with its content; it also sells its readers’ attention to advertisers. While antitrust doctrine certainly has considerable room to develop in this area, it is at least relatively comfortable with these online platforms. The types of harm that might be imposed by a dominant platform are fairly straightforward: the platform might increase prices to advertisers, increase attention costs to readers, etc.<sup>23</sup>

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18 *Id.* at 42–43.

19 Cedric Argenton & Jens Prüfer, *Search Engine Competition with Network Externalities*, 8 J. COMP. L. & ECON. 73 (2012).

20 Rachel Botsman, TED Talk: The Currency of the New Economy Is Trust (June 2012), available at: [https://www.ted.com/talks/rachel\\_botsman\\_the\\_currency\\_of\\_the\\_new\\_economy\\_is\\_trust](https://www.ted.com/talks/rachel_botsman_the_currency_of_the_new_economy_is_trust).

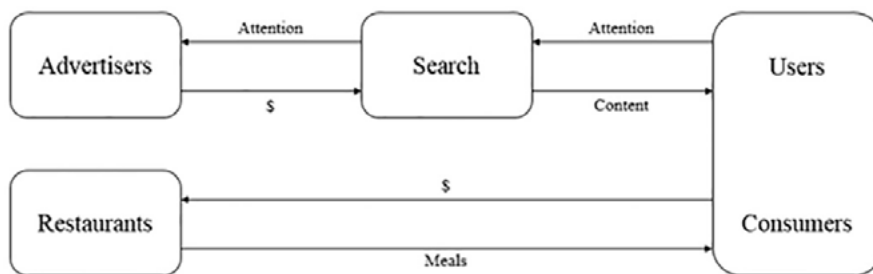
21 TOM SLEE, WHAT’S YOURS IS MINE: AGAINST THE SHARING ECONOMY 98 (2015).

22 See generally, e.g. PATTERSON, *supra* note 10, at 45 (“[P]roviders like television networks and Internet search engines operate in markets with two sets of customers, the viewers or users whom they attract by providing information for free and the advertisers that pay to reach those viewers and users.”).

23 John M. Newman, *Antitrust in Zero-Price Markets: Applications*, 94 WASH. U. L. REV. 49, 67 (2016).

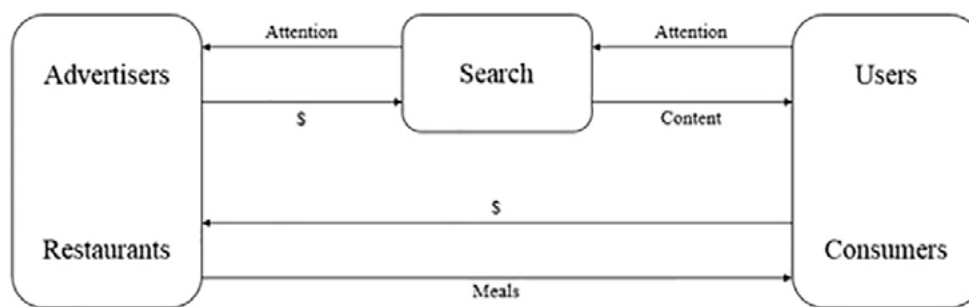
Other platforms are more complex. For example, general-search platforms play a similar role as to advertisers and users — but general search also functions to bring together sellers and buyers of real-world products. A user might search for “local restaurants” in order to facilitate a distinct, real-world transaction: the purchase of a meal. Figure 1 depicts this additional relationship.

Fig. 1



The novel risk of competitive harm arises when the real-world transactional counterparty to consumers also becomes a counterparty to the relevant platform. Using the above example, this could occur where restaurants become advertisers on the search platform. Figure 2 depicts this dualistic role.

Fig. 2



In the presence of information overload, users often look to platforms to serve as filters. Here, reputation (via algorithmically ordered ranking) often plays a central role. The danger is that a platform may have the power to tilt the real-world playing field in favor of its own favored counterparties. Where this is so, a platform could be incentivized to alter its reputational system in order to deliver consumers to its favored partners. The ultimate effect is foreclosure of non-favored sellers from the real-world market. The resulting rents from the real-world market would allow the favored partners to compensate the platform for its exclusion of the non-favored sellers.

### III. CASE STUDY: ZILLOW–TRULIA

On July 28, 2014, Zillow and Trulia announced plans to combine into Zillow Group (“ZG”). At the time, the two firms were the largest and second-largest online real-estate portals, respectively. After an intensive six-month review that included a second request for additional productions, the FTC unanimously voted to clear the deal without condition. The FTC concluded that the “balance of the evidence” did not support defining the relevant market as “real estate portals,” and that the evidence was “inconclusive” as to whether the deal would harm competition.<sup>24</sup>

During an agency investigation, enforcers have access to documents, data and witness statements not available to the general public. Thus, while this article uses the *Zillow–Trulia* acquisition as a case study of how complex harm *might* arise in certain markets, the case study is illustrative only. In other words, this article does not set out to demonstrate that the deal actually harmed competition, only that it may have. To do so, it draws on publicly available statements made by ZG executives after the deal was consummated.

<sup>24</sup> Statement of Comm’r Ohlhausen, Comm’r Wright, and Comm’r McSweeney Concerning Zillow, Inc./Trulia, Inc., at 1 (Feb. 19, 2015), [https://www.ftc.gov/system/files/documents/public\\_statements/625671/150219zillowmko-jdw-tmstmt.pdf](https://www.ftc.gov/system/files/documents/public_statements/625671/150219zillowmko-jdw-tmstmt.pdf).



## A. Market Power

Whether the relevant market was “online real-estate portals” as to advertisers or users (or both), Zillow and Trulia likely had market shares large enough to warrant a presumption that the combined firm would possess market power. The FTC investigation “uncovered some qualitative evidence consistent with” that definition, “including . . . documentary evidence demonstrat[ing] that the parties closely tracked one another in terms of consumer traffic, site features, and pricing.”<sup>25</sup>

Post-acquisition statements by ZG are also consistent with that definition. During an earnings call in 2016, for example, ZG’s Chief Executive Officer, Spencer Rascoff, observed that “Zillow Group represented greater than 67 percent of the total online real estate category in June and 78 percent of the category on mobile only.”<sup>26</sup> Those market shares would likely be enough to warrant a presumption, under U.S. antitrust law, that ZG possesses monopoly power.<sup>27</sup> The likely presence of network effects, which can be treated as a barrier to entry,<sup>28</sup> would buttress that conclusion.

## B. Anticompetitive Effects

Mergers between rivals who compete in reputation-centric platform markets can cause a variety of competitive effects, some beneficial and others harmful. The latter may be either “simple” (i.e. relatively familiar) or “complex.” The *Zillow–Trulia* acquisition may have caused simple harm; it may also have caused — indeed, may still be causing — complex harm.

### 1. Simple Harm

Mergers like *Zillow–Trulia* create the possibility of relatively familiar anticompetitive harms. First, the reduction of head-to-head competition could allow the merged firm to raise prices to advertisers. Second, the merged firm could face lowered incentives to compete for users. The FTC’s investigation considered both of these possibilities. As to harm to advertisers (specifically, real-estate agents), the FTC found the evidence of harm was “inconclusive.”<sup>29</sup> As to users, the FTC found that ZG would “continue to have strong incentives” to innovate.<sup>30</sup>

But post-acquisition statements by ZG executives anecdotally suggest that the deal may in fact have lessened head-to-head competition. During a 2015 Earnings Call, for example, ZG’s CEO observed that the Trulia acquisition “consolidate[ed] and rationaliz[ed] the category.”<sup>31</sup> In a complaint challenging another recent merger — this one between US Airways and American Airlines — the U.S. Department of Justice quoted nearly identical language as evidence of likely harmful effects.<sup>32</sup> More directly, ZG’s CEO stated that, after the acquisition, ZG “sunsetting promotional discount pricing on Trulia, which has resulted in lower advertiser net adds.”<sup>33</sup> This statement could reasonably be interpreted as describing a price increase and corresponding output reduction in the market for

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25 *Id.* at 1.

26 Zillow Group, Q2 Prepared Remarks (Aug. 4, 2016), available at: <http://investors.zillowgroup.com/financials.cfm#results>; see also Rory Van Loo, *Rise of the Digital Regulator*, 66 *DUKE L.J.* 1267, 1293–94 (2017).

27 *Cf.*, e.g. *United States v. Dentsply Int’l, Inc.*, 399 F.3d 181 (3d Cir. 2005) (“Dentsply has long dominated the industry . . . and enjoys a 75–80% market share on a revenue basis, [and] 67% on a unit basis . . .”).

28 *C.f.*, e.g. *United States v. Microsoft Corp.*, 253 F.3d 34, 55 (D.C. Cir. 2001) (referring to a “chicken-and-egg” situation *vis-à-vis* software developers and consumers).

29 Statement, *supra* note 25.

30 *Id.*

31 Zillow Group, Q3 Prepared Remarks (Nov. 3, 2015), available at: <http://investors.zillowgroup.com/financials.cfm#results>.

32 *United States v. US Airways Grp., Inc.*, No. 1:13-cv-01236, at 6 (D.D.C. Aug. 13, 2013) (“As its CEO candidly stated earlier this year, US Airways views this merger as ‘the last major piece needed to fully rationalize the industry.’”). To the extent it is relevant, the author very briefly represented the United States in this matter. This article represents solely the views of the author and does not reveal any confidential information.

33 Zillow Group, Q2 Prepared Remarks (2015), available at: <http://investors.zillowgroup.com/financials.cfm#results>.

online real-estate portals to advertisers.

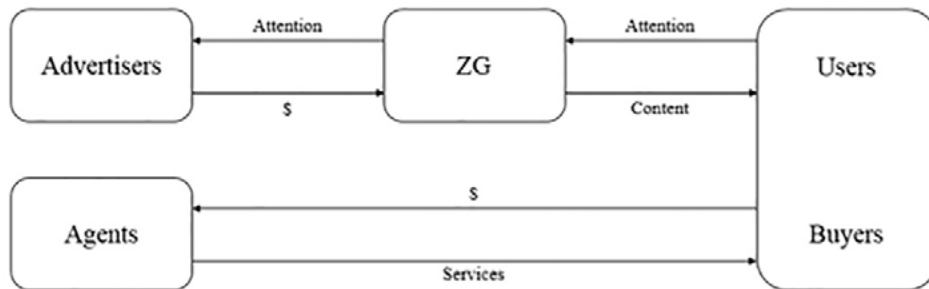
These harmful effects, if they in fact occurred, are relatively familiar to antitrust analysts. The FTC conducted a rigorous investigation of their likelihood before deciding to allow the deal, though that decision may have constituted a false negative. But it is also possible that the acquisition caused more complex anticompetitive effects — effects that enforcers may have overlooked altogether.

## 2. Complex Harm: Practice

ZG competes in a complex environment, structurally similar to the one depicted in Figure 2 above. ZG operates a platform business model — “online real-estate portals.” On one side of the platform, ZG markets an information-based product to users. In large part, its value stems from the portals’ filtering function: they allow users to access a winnowed-down set of real-estate listings that fit given criteria. Instead of seeing, for example, “all listings in New York,” users can filter by price, ZIP Code, number of bedrooms, etc. ZG exchanges its real-estate portal to users for their attention, which ZG then sells to advertisers on the other side of the platform.

ZG also facilitates real-world transactions. The content delivered to users via ZG’s platform includes lists of relevant real-estate agents offering services to prospective real-estate buyers. Figure 3 displays these relationships.

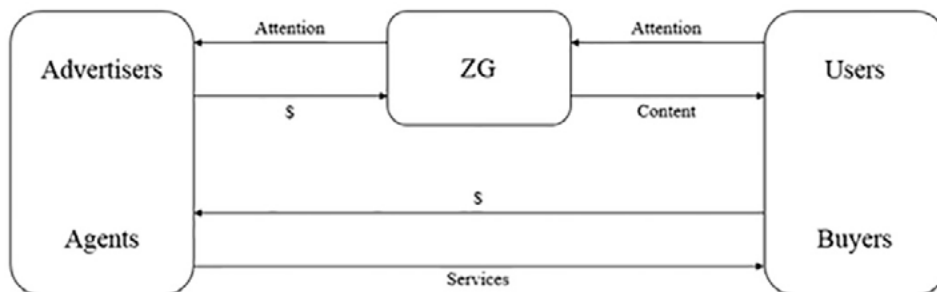
Fig. 3



These algorithmically curated agent lists contain — indeed, appear to users to be driven by — agent reputation. ZG displays the familiar star-system rating (one to five stars) and information on the number of “recent sales” next to each agent whose information and photo appear in the curated agent lists. ZG also may identify listed agents as “Premier Agents.”

Given the importance of reputation as a filter for information-overloaded user-buyers, appearing in ZG’s lists may be of no small competitive significance for local real-estate agents. One might be forgiven for assuming “Premier Agents” are those whom users rate highly. But “Premier Agent” in fact appears to describe an agent who pays a premium to ZG to appear prominently in its agent lists. Figure 4 illustrates the dualistic role agents play in these markets.

Fig. 4



Post-deal statements from ZG executives suggest a shift in strategy to favor these “Premier” agent-advertisers, and to disfavor other agents. ZG’s CEO stated in 2015, for example, “[W]e will continue to encourage lower performing agents to leave.”<sup>34</sup> This strategy was designed to help Premier Agents “grow their market share in their respective cities.”<sup>35</sup> More specifically, as ZG’s CEO

<sup>34</sup> Zillow Group, *supra* note 32.

<sup>35</sup> *Id.*

put it, the strategy had the effect of “accelerating the larger trend across the real estate agent population of higher producing agents *gaining market share* from those who are less competitive.”<sup>36</sup>

The *Zillow–Trulia* acquisition thus illustrates how conduct in reputation-driven platform markets may cause complex anti-competitive effects. In the context of platforms, antitrust analysts generally define relevant markets around the platform’s immediate customers.<sup>37</sup> But by “steering”<sup>38</sup> real-world buyers to certain favored suppliers, a platform may also increase power in a separate — though related — market. So long as there is a means for the favored suppliers to split the resulting rents with the platform, the platform is incentivized to engage in such steering. In the case of ZG, the platform may steer prospective home-buyers to favored agents, consolidating local agent markets and increasing favored agents’ market power. Rent-splitting may then occur via the favored agent–suppliers’ payments to ZG in exchange for “Premier Agent” status.

The profitability of such a strategy will increase along with the dominance of the platform in its immediately adjacent markets. A dominant platform signifies fewer meaningful alternative routes for those users who wish to avoid being “steered.” The lack (or elimination by, e.g. acquisition) of rivals available to deal with non-favored parties would also facilitate the strategy. Using the ZG example, these “non-favored parties” would be the “lower performing agents” who, after the acquisition went through, were “encourage[d] . . . to leave.” To the extent either Trulia or Zillow, pre-acquisition, was willing to deal with such agents, that firm acted as a competitive constraint on its rival’s ability to increase agents’ power in their local markets.

The effectiveness — and harmful effects — of such steering may also be magnified by certain platforms’ unique competitive role. Consumers tend to view platforms like ZG, Google, etc., as providers of information *per se*.<sup>39</sup> Unlike advertisers, who clearly provide information in order to sell other products, modern platforms sometimes appear to have no such ulterior motive for providing their curated content. Where a counterparty has “no obvious interest in the subject of the information, we are not so likely to approach it with our guards up.”<sup>40</sup> But the ability to split rents with favored counterparties may create an ulterior motive. Where consumers are unaware of this dynamic, they will continue to treat the platform as an “objective” third party. Such consumers are particularly likely — if unwitting — targets for steering.

## IV. CONCLUSION

Not every innovation increases market complexity, although some do. And not every innovation facilitates novel types of anticompetitive harm. But some do. Platforms may use the power of reputation to steer users to favored suppliers, thereby foreclosing non-favored suppliers and harming competition in a related — though distinct — relevant market. Where the favored suppliers are able to split the resulting rents with the platform, such a strategy may be rational. Antitrust enforcers and courts should take the possibility of such harms into consideration when analyzing marketplace conduct. If antitrust is to remain “supple” enough to oversee technology-driven markets, it must proceed with a full awareness of the complex competitive strategies available in such markets.

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36 Zillow Group, *supra* note 27 (emphasis added).

37 E.g. Memorandum to Fed. Trade Comm’n, Subject: Google, Inc. 64, 69 (Aug. 8, 2012) (proposing relevant markets for “horizontal search” and “search advertising”).

38 Enforcement agencies have, of late, shown increasing interest in steering-related behavior. See *United States v. Am. Express Co.*, 838 F.3d 179 (2d Cir. 2016) (addressing credit-card companies’ use of “anti-steering rules” in their merchant contracts); Press Release, Dep’t of Justice, Justice Department and North Carolina Sue Carolinas Healthcare System to Eliminate Unlawful Steering Restrictions (June 9, 2016).

39 PATTERSON, *supra* note 10, at 10 (“[C]onsumers of information may view information provided by firms like Google and Yelp differently, and less skeptically, than they view advertising from the seller of a product.”).

40 *Id.* at 11.

# CONSUMER'S SEARCH IN THE ERA OF BIG DATA

BY MICHELE POLO<sup>1</sup>



## I. INTRODUCTION

Consumer's choice requires the collection of information to make a conscious and satisfactory decision. This structural feature of consumption has dramatically changed with the Internet and the diffusion of big data. This note reviews the impact of web-based searches on consumers' satisfaction and surplus, distinguishing the case of search and experience goods.

## II. SEARCHING FOR A SEARCH GOOD...

Search goods are those products or services whose attributes can be adequately evaluated through search and inspection before purchasing and consuming them. For example, buying an airline ticket from a given place of departure to a final destination requires the purchaser to consider the price, the time of the flight, the business/economy class, the connections for non-direct flights and other contractual restrictions. All these elements can be collected before choosing the preferred option.

The Internet and big data have deeply changed the way consumers approach searching and, ultimately, satisfy their needs of searched goods.<sup>2</sup> First, search costs are substantially reduced, since collecting information on the web is a cheap, simple and quick activity. Lower search costs boost search activity by consumers, who may find it convenient to sample a larger number of options before choosing and purchasing a good in the first place. In an off-line world, with larger search frictions, they would have made their choice based on a smaller sample of options, or they might have not even participated in the market. Second, in comparison with an off-line environment, search results are typically not received at random, but rather they come in

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<sup>2</sup> See, for a comprehensive survey, Anderson S. and Renault R. (2016), Firm Pricing and Consumer Search, (forthcoming), *Handbook of Game Theory and Industrial Organization*, L. Corchon and M.Marini (eds.), Edward Elgar, and Armstrong M. (2016), Ordered Consumer Search, CEPR DP n.11566.

a predetermined order. It may be the listing of results of a search engine, or it may derive from a natural ranking in the inspection of sample results that are retrieved with some easily observable elements (e.g. the price) and other (e.g. characteristics) that require a time consuming inspection. Finally, when a consumer repeatedly uses a digital platform, providing personal information and generating a search and click history, the platform itself may be able, by analyzing big data through algorithms, to provide a personalized ordering that better fits the preferences of the consumer. In short, in the digital world, search is cheaper, ordered and personalized. Consumers will sample more, more frequently and following a certain order.

While this statement correctly applies to those consumers who have the knowledge and habit to use the web, there are still groups and cohorts that remain off-line. While we may reasonably think that the share of informed consumers has increases with the web, we should keep in mind the distributional effects and externalities across users. The interaction between savvy and non-savvy users may go either way. A search externality suggests that a large fraction of informed consumers, putting more pressure on firms, induces lower prices and higher qualities to the benefit of all buyers, including the uninformed ones. However, we may also have an opposite effect that comes from non-savvy customers, who are ripped off with supernormal prices, to the savvy ones, which benefit from a lower base price set by firms.<sup>3</sup>

Turning to firms, being positioned at the top of a search ordering is profitable, since consumers will more frequently patronize the prominent options. Competition for prominence, then, will determine the ordering of sponsored results, a better position in the banners of a web page, as a popular mass consumer product will pay to occupy the more visible shelves in a supermarket.

The key question in an antitrust perspective is whether competition for prominence will determine an ordering of products that is consistent with consumers' preferences, such that consumers sampling along the ordered results will end up with an optimal matching. Several recent papers have explored this issue under different perspectives, confirming in many cases this property.<sup>4</sup> Products that are sampled first, being inspected by a larger number of consumers, have a more elastic demand and therefore, for given attributes, have an incentive to set a lower price.<sup>5</sup> Hence, they get higher profits through larger sales rather than higher mark ups. Moreover, a higher quality (search) product is more likely to match consumers' preferences and to be selected if inspected. Hence, higher quality products gain relatively more from being prominent. Their marketing effort will be higher, in the form of advertising expenditures or bids for sponsored search slots, and they will end up being more visible. The message coming from these recent contributions, therefore, in several cases confirms that competition for prominence may determine a better matching of consumers and goods even when the former have to collect information through costly searches.

Before drawing general conclusions and suggesting a weak antitrust enforcement, some caveats are in order. First, the hints from economic analysis are today still partial and not unanimous, obtained under restrictive assumptions and not yet adequately tested. Second, and more importantly, we have to consider whether market power may distort the apparently favorable mechanism that aligns consumers and firms' preferences.

Market power is a relevant issue for the sellers' as well as for the platforms' side. When the market for the searchable good is concentrated and producers have market power, consumers may be harmed by two different practices, obfuscation and price discrimination. Sellers may find it convenient to increase search frictions, obfuscating their product, for instance by publicly announcing that their good is not sampled in a price comparison website, or making it harder to collect all the relevant information on the good's attributes, or adopting complex pricing schemes. Introducing search frictions, indeed, may lead to a generalized increase in prices, and the obfuscating firm, although losing prominence, would still gain from higher prices.<sup>6</sup>

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3 Armstrong M. (2014), Search and Ripoff Externalities, University of Oxford, Dept. Economics DP n. 715.

4 See Armstrong M., Vickers J. and Zhou J. (2009), Prominence and Consumer Search, *Rand Journal of Economics*, and Athey S., and Ellison G. (2011), Position Auctions with Consumer Search, *Quarterly Journal of Economics*, 126: 1213-70.

5 This holds true when demand is log-concave, see Armstrong (2016).

6 See Armstrong (2016), sect. 4 and Ellison G. and Ellison S. (2009), Search, Obfuscation and Price Elasticities on the Internet, *Econometrica*, 77: 427-52.

While obfuscation has a clear negative impact on consumers, the effects of price discrimination are less univocal. Big data and consumer profiling lead to segmenting of the market and post a full range of different prices, up to the limit of perfect price discrimination through individual prices that extract all the consumer surplus. However, this is not the end of the story, and the Internet environment features different and conflicting effects. Indeed, the web facilitates reselling (buying on Amazon and selling on eBay), reducing the ability of producers to price discriminate. Evidence suggests that price discrimination tends to take a less extreme form, with prices posted for groups of consumers rather than differentiated at the individual level. Distributional concerns are relevant across different groups of consumers, but the decisive effect relates to the possibility that, through price discrimination, sellers find it convenient to serve a larger group of consumers, some of which would instead be rationed if a single price were imposed. Economic theory and antitrust practice have suggested that the phenomenon requires a careful analysis and flexible evaluation, as the British OFT (2013) and the Executive Office of the President of the USA (2015) documents claim.<sup>7</sup>

Price discrimination may also emerge due to the composition of consumers according to their search costs. Energy retail markets are a good example. Recently the British Competition and Market Authority released a report on the UK energy markets that, among other issues, shows that a non-negligible fraction of final users does not exploit all the opportunities offered in the retail energy markets. Although price comparison websites would allow consumers to compare the offers and choose the best deal with very modest search costs, consumers show a low level of engagement and often carry on with their legacy contracts even when not convenient. The main operators choose menus of contracts that allow to segment the market and price discriminate. We observe similar patterns also in other European markets, suggesting that search and switching costs may persist for certain categories of goods or services notwithstanding the opportunities of the web.<sup>8</sup>

A second line of arguments refers to dominance of the digital platform that offer support to consumers' search activity. There are several reasons why we may fear the emergence of quasi-monopolistic positions in these markets. The importance of network externalities, emphasized by the multi-sidedness of digital platforms, generates a push to market tipping. The access to detailed personal information on users further fuels this loop, allowing platforms to create higher quality services that are offered to users for free, cashing in their attention on the advertising side. The larger financial resources obtained boost research and development in the improvement of the algorithms. The rich list of effects supporting a tendency to dominance has to be contrasted with counter-arguments that call for a different prediction. On top of them, digital platforms offer different services, from search engines to social networks to online shopping, each one being a way to help consumers' searches and a channel for advertisers to reach them. In other words, digital platforms would be differentiated and complementary, and there is no reason why one should prevail over the others. Internet platforms, in turn, collect different information on consumers' tastes, choices and traits. They represent different sources of personal information, each one being able, to a certain extent, to profile its users. These latter, in turn, tend to multi-home, using different platforms for different purposes, and disseminating their information in several data bases with no exclusivity. Finally, advocates of a digital world without dominance argue that the economies of scale and scope in data collection need to profile consumers are not so large, and even new entrants can easily reach a significant performance. The hot debate on these issues has not found a common conclusion,<sup>9</sup> and each prediction is countered by an opposite one. Only a careful empirical analysis of the relative importance of the different effects may help reach a sound and well-grounded judgement, which, being empirically based, will hardly be a general one.

Coming back to the impact of platforms' market power on users, the key question refers to the possibility that dominance weakens the incentives to provide high quality services to consumers. In other words, once a dominate position is reached in a given segment of the digital world, is it possible that the platform will reduce its research effort, while still being non-contestable by new entrants? We know that network goods benefit consumers through two different channels. The intrinsic quality of the service provided (stand-alone value) and the positive contribution of being popular (network externality). This latter effect, once reached a

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7 Office of Fair Trade (2013), *The Economics of Online Personalized Pricing*, and Office of the President of the United States of America (2015), *Big Data and Differential Pricing*.

8 See Crampes C. and Waddams C. (2017), *Empowering Electricity Consumers in Retail and Wholesale Markets*, CERRE Policy Report.

9 See Lerner A. (2014), *The Role of Big Data in Online Platform Competition*, <http://papers.ssrn.com/abstract=2482780>, Rubinfeld D. and Gal M., *Access Barriers to Big Data*, *Arizona Law Review*, 59: 339-81, and OECD (2016), *Big Data: Bringing Competition Policy to the Digital Era*, DAF/COMP(2016)14.

dominant position, ensures an advantage over smaller competitors even when these latter provide a higher stand-alone value, and may therefore push to a reduction in the innovative efforts of the large operator. Again, we find a potential adverse effect on market power, that requires an empirical evaluation.

To conclude, the opportunities that the web and big data offer to improve the efficacy of searching while reducing its cost exert important positive effects on consumers. Cheaper searches can increase the level of participation and market size. Competition for prominence may align the incentives of consumers and sellers with a better match. However, market power on the sellers' side may distort these positive features through obfuscation and price discrimination. Digital platforms, the pivotal cornerstones for search activities, display a mixture of elements that push towards dominance or soften the tendency to market concentration, the ultimate word coming from a careful empirical analysis case by case. Platforms' dominance, if confirmed, may be an additional ingredient that reduces the potential benefits of the web on consumers' surplus from search goods by softening innovation.

### III. ...AND CHOOSING AN EXPERIENCE GOOD

Renting an apartment may be a hard task both on the landlord and on the guest side, an example of the difficulties that arise with experience goods. The landlord may fear that the guest will damage the apartment, while the guest may be uncertain about the characteristics of the flat and the care the landlord will take to accommodate reasonable requests during the stay. These information asymmetries will be solved only by consuming the good, which is renting the apartment.

If expectations are pessimistic, many potentially favorable deals may fail to realize. Economists usually suggest that repeated interaction may solve this market failure by creating the proper incentives to behave well. Continuing with our example, if the visitor discovers that the flat is worse than pledged, or that the landlord does not take care of his guests, the consumer will not try a second time. The same mechanism applies with the landlord, which will refuse to rent his flat again to the guest if this latter misbehaved during his stay. Unfortunately, this solution does not work if interactions between the same pair of agents are infrequent, as presumably would be the case in our example.

The web has offered a new and easy solution to this problem. If the matching of the landlord and the guest occurs through a digital platform, this latter will always be the intermediary of a search for apartments (all over the world) by the guest, and a search for guests (among all tourists) by the landlord. Frequency is now potentially restored, since the tourist will interact with the platform every time he is planning a travel, and the landlord will use the platform every time he is looking for a guest. Both sides have now an incentive to well behave if, once reviewed after the stay, a poor record would lead to a downgrading of their future opportunities. The longer and richer the string of information that enter into the agents' files, the stronger the incentives. The opportunities for deals for experience goods are therefore substantially improved by digital platforms, as many examples, from AirBnB to BlaBlaCar or Uber, suggest. The market expansion effect of the web and big data, that we already claimed for search goods, is even stronger for experience goods.

The positive effect of digital intermediaries, at the same time, poses an intriguing issue in an antitrust perspective. On the one hand, we may expect the benefits of actual or potential competition to apply also to digital intermediaries, in the form of lower fees and a better service. On the other, in the case of experience goods an additional efficiency argument may apply. More numerous and smaller intermediaries may be unable to provide an effective enforcement mechanisms, leading to a contraction of the market. Indeed, consider a market with several competing platforms offering the same service, and where agents multi-home. In this case, the interactions take place involving different intermediaries, becoming less frequent on each platform. Moreover, past reviews offer only a partial record of the multi-homing agent's history, and misbehavior leads to the downgrading on just one of the affiliated platforms. All these effects may weaken the effectiveness of the mechanism and reduce its market expansion effect.

This particular efficiency argument might be compared, when handling a case, with the adverse effects of restricted competition. The argument potentially applies to all areas of antitrust enforcement. In a mergers case a reduction in the number of intermediaries increases market power but, at the same time, makes the incentive mechanism more effective. Monopolization entails the prevalence of a single platform, with the negative and positive effects further enhanced. An agreement among intermediaries to pool and share

the reviews of past deals is, at the same time, a dangerous sharing of information on individual transactions and a way to cover the past history of agents even when these latter multi-home.

We do not suggest that with experience goods digital intermediaries should be lifted from antitrust scrutiny and enforcement. We simply mention a specific efficiency argument that should be considered. The overall evaluation of a case, then, will depend on the relative importance of the negative and positive effects envisaged, an evaluation that should be based on empirical evidence.





