

What challenges does the digital economy present for the development of antitrust law?

Introduction

In recent decades, the digital economy has been the biggest driver of disruptive innovation and has brought technological benefits to billions of consumers around the world. Ten percent of employees in the United Kingdom are now employed by digital businesses.¹ More than half of EU citizens ordered goods or services over the internet last year.² In June 2017, Facebook announced that it now has two billion monthly active users.³ As traditional economies migrate to the digital age, antitrust enforcement authorities must ensure that those markets continue to work in the interest of consumers. The digital economy is now presented with two inter-related technological challenges – big data and artificial intelligence – which are anticipated to transform the digital economy and, some believe, will give rise to the next industrial revolution.⁴

It is possible to distinguish between two types of challenge that the digital economy presents to antitrust law. The first type of challenge is illustrated by the UK Competition & Markets Authority's recent infringement decision against two poster retailers, found to have explicitly colluded using a re-pricing algorithm.⁵ Notwithstanding the enforcement challenge of pricing software tools being used to facilitate anti-competitive practices, the illegality of such behaviour is uncontroversial, and limited change to antitrust law (if any) is needed to address such behaviour.

The second type of challenge presented by the digital economy, which this essay attempts to explore, concerns anti-competitive practices that may not be adequately addressed by existing antitrust law. The first part of this essay considers the challenge presented by pricing algorithms enabling firms to attain the same effects of hardcore cartels through tacit collusion. The second part of this essay considers three challenges to antitrust law presented by the so-called "*data economy*".⁶ The final part of this essay considers the potential liability issues presented by artificial intelligence.

Computer cartels and the oligopoly problem

Economic and antitrust literature has grappled with the consumer welfare implications of tacit collusion for decades, particularly under oligopolistic market conditions.⁷ Concerns have usually been limited to narrowly defined economic models, due to the strict conditions required to facilitate such behaviour. In addition to oligopolistic market conditions, tacit collusion requires high entry barriers, market transparency, frequent inter-firm interactions and mechanisms to punish 'cheaters'; and tacit collusion is hindered by demand fluctuations, cost asymmetries, product differentiation and heterogeneous business strategies.⁸

However, in digital markets, many of these restrictions may be overcome through the use of artificial intelligence and, in particular, the application of pricing algorithms. Firstly, the greater processing capacity of pricing algorithms could enable coordination between a greater number of market players, meaning oligopoly is no longer a necessary condition to sustain tacit collusion.⁹ Secondly, communication through the internet allows for greater market transparency, by enabling real-time price monitoring and the implementation of instantaneous price changes.¹⁰ Indeed, the European

¹ House of Commons, Business, Innovation and Skills Committee, 'The Digital Economy: Second Report of Session 2016-17' (2016), page 4.

² European Commission, 'Commission Staff Working Document accompanying the Final Report on the E-commerce Sector Inquiry' (2017), paragraph 7.

³ Financial Times, 'Facebook crosses 2bn users a month milestone' (27 June 2017).

⁴ Klaus Schwab, *The Fourth Industrial Revolution* (World Economic Forum, 2016).

⁵ Competition & Markets Authority, Case 50223, 'Online sales of posters and frames' (12 August 2016).

⁶ The Economist, 'Data is giving rise to a new economy' (6 May 2017).

⁷ George Stigler, 'A Theory of Oligopoly' (1964) 21 *The Journal of Political Economy* 44; Richard Posner, 'Oligopoly and the Antitrust Laws: A Suggested Approach' (1968) 21 *Stanford Law Review* 1562.

⁸ Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright and Jean Tirole, 'The Economics of Tacit Collusion – Final Report for DG Competition' (2003).

⁹ OECD, 'Algorithms and Collusion: Competition Policy in the Digital Age' (2017), pages 20-24.

¹⁰ Ibid.

Commission has found extensive evidence of firms using software to track the online prices of their competitors.¹¹ Thirdly, it is believed that, in the future, algorithms will be capable of interpreting market conditions and supply/demand fluctuations, in order to distinguish between legitimate cost-reflective price reductions and 'cheaters' undercutting cartel prices.¹² Algorithms are finally more rational than their human counterparts, and can balance short- and long-term profit maximisation much more effectively (reducing the incentive to 'cheat').¹³

If the threat posed by artificial intelligence is legitimate, then the harmful effects of hardcore price-fixing cartels could become widespread practice throughout the digital economy. However, antitrust law does not prohibit tacit collusion. For instance, under Article 101 of the Treaty on the Functioning of the European Union ("**TFEU**"), tacit collusion would fall outside the concept of a concerted practice.¹⁴ It is therefore necessary to consider how antitrust law could develop to address such behaviour.

One approach may be to broaden the concept of an agreement or concerted practice, for example, by introducing an alternative strand to the concept of a 'meeting of minds'. This "*meeting of algorithms*"¹⁵ could be prohibited on the basis that it constitutes a highly sophisticated form of communication, which allows pricing algorithms to "*decode*" each other's conduct.¹⁶ Such an approach could also be developed as an advanced form of price signalling that is unique to pricing algorithms, building on the European Commission's recent *Container Shipping* commitments decision.¹⁷ An alternative approach would be to shift the focus of antitrust law from the means of achieving cartel pricing towards a more effects-based approach. In this regard, Louis Kaplow has argued that a "*communications-based*" prohibition to determine a finding of collusion is inadequate, because it only considers a subset of a means to a socially undesirable end (supra-competitive pricing),¹⁸ and therefore antitrust enforcement authorities should adopt a "*direct approach*" by inferring oligopolistic price coordination from market-based evidence.¹⁹ A third approach would be to prohibit tacit collusion as an excessive pricing abuse by jointly dominant firms under Article 102 TFEU.²⁰

The problem with any of the approaches set out above is that they potentially expand the notion of agreement such that firms are deprived of the ability to adapt themselves intelligently to the conduct of their competitors, which is a protected right under most antitrust systems.²¹ The European Court of Justice would certainly have to revise or distinguish established case law in this regard.²² As the Acting Chairman of the Federal Trade Commission recently explained during a speech, "*we cannot tell firms to ignore the public behavior of their rivals when they set prices without deleting the "free" in free market*".²³ The consumer welfare implications of such a change would also be ambiguous, because punishing firms for attempting to compete legitimately may have a chilling effect, which

¹¹ European Commission, *E-commerce Sector Inquiry* (n2), paragraph 149.

¹² OECD, *Competition Policy in the Digital Age* (n9), pages 20-24.

¹³ Ibid.

¹⁴ European Union, 'Algorithms and Collusion – Note from the European Union' (2017), paragraph 33 citing Case 40/73, *Suiker Unie* (1975), paragraphs 26 and 174.

¹⁵ OECD, *Competition Policy in the Digital Age* (n9), page 37.

¹⁶ European Union, *Algorithms and Collusion* (n14), paragraph 33.

¹⁷ European Commission, Case AT.39850, *Container Shipping* (2016).

¹⁸ Louis Kaplow, 'Direct versus Communications-Based Prohibitions on Price Fixing' (2012) *Journal of Legal Analysis* 449, page 529.

¹⁹ Ibid, pages 465-468.

²⁰ Félix Mezzanotte, 'Using Abuse of Collective Dominance in Article 102 TFEU to Fight Tacit Collusion: The Problem of Proof and Inferential Error' (2010) 33 *World Competition* 77.

²¹ Joined cases 40 to 48, 50, 54 to 56, 111, 113 and 114/73, *Suiker Unie and others v Commission* (1975), paragraph 174; *Brooke Group v Brown & Williamson Tobacco Corp* (1993) 509 US 209, page 227.

²² Case 48/69, *Imperial Chemical Industries* (1972), paragraph 118 ("*Every producer is free to change his prices, taking into account in so doing the present or foreseeable conduct of his competitors.*") (Emphasis supplied).

²³ Maureen Ohlhausen, Acting Chairman of the US Federal Trade Commission, '*Should We Fear The Things That Go Beep In The Night? – Some Initial Thoughts on the Intersection of Antitrust Law and Algorithmic Pricing*' (23 May 2017), page 5.

could harm consumers and rob them of the potential benefits of algorithmic pricing. A much deeper understanding of the economic effects of tacit collusion is clearly needed before any fundamental changes are introduced to antitrust law.

It is therefore sensible to begin by seeking guidance from existing enforcement tools. An OECD roundtable has recently suggested that antitrust enforcement authorities should conduct market studies in order to evaluate whether algorithmic collusion is a commonly observed phenomenon and, if so, under which conditions and in which industries it should be expected.²⁴ Digital markets are obvious candidates. The European Commission's own-initiative investigation into the use of pricing software by online consumer electronics retailers, which was launched during its sector inquiry into e-commerce, is a good example of this type of enforcement approach.²⁵ Jurisdictions with market investigation regimes are also able to experiment with behavioural and structural remedies to resolve concerns in specific digital markets.²⁶ Only then should policy makers consider whether the concept of agreement needs to be revisited.²⁷

Big Data and 'personalised' pricing

Data are now the most valuable resource for firms operating in the digital economy.²⁸ By collecting vast volumes of data on consumer behaviour, preferences and habits ("**Big Data**"), firms can analyse that information to tailor their goods and services to customers, thereby acquiring a competitive advantage. Whilst Big Data can be used to compete legitimately, dominant firms may be in a position to use Big Data to engage in exploitative or exclusionary practices.

One example of potentially exploitative behaviour is personalised pricing. Consumers are heterogeneous in their willingness-to-pay for products or, in other words, some consumers are happier to pay a higher price for the same things than other consumers. The ability to match price to a customer's willingness-to-pay is arguably the holy grail for maximising firm profit, especially in the digital economy, where retailers do not interact with their customers face-to-face. However, the combination of Big Data and artificial intelligence can be used to build profiles of individual customers, and develop pricing strategies designed to capture each category of customer's maximum willingness-to-pay. Although personalised pricing remains rare in digital markets, there are already signs that the practice is beginning to take hold. Two percent of retailers responding to the European Commission's e-commerce sector inquiry stated that they have applied dynamic/personalised pricing based on the online behaviour of individual customers.²⁹

Personalised pricing raises significant policy questions for antitrust enforcement authorities. The welfare effects of price discrimination are considered to be ambiguous, especially outside conditions of pure monopoly.³⁰ An analysis of price discrimination under conditions of competition should therefore be considered on a case-by-case basis. Furthermore, notwithstanding the potential benefits to consumers, personalised pricing could lead to undesirable outcomes where customers are effectively charged according to their race, gender or political beliefs (to the extent such practices are not prohibited by equality legislation).

It would also be necessary to consider whether antitrust law is an appropriate forum for business-to-consumer price discrimination, as opposed to consumer protection law. There may even be a legal constraint on the application of antitrust law to such behaviour, as it is not clear whether personalised pricing can be said to have an effect on *competition*, and evidence of consumer harm

²⁴ OECD, *Competition Policy in the Digital Age* (n9), pages 40-41.

²⁵ European Commission, 'Commission opens three investigations into suspected anticompetitive practices in e-commerce – press release' (2 February 2017) (accessible at: http://europa.eu/rapid/press-release_IP-17-201_en.htm).

²⁶ OECD, *Competition Policy in the Digital Age* (n9), page 41.

²⁷ Ibid, page 51.

²⁸ The Economist, 'The world's most valuable resource is no longer oil, but data' (6 May 2017).

²⁹ European Commission, *E-commerce Sector Inquiry* (n2), paragraph 152.

³⁰ Ramsi Woodcock, 'Big Data, Price Discrimination, and Antitrust' (2017) 68 *Hastings Law Journal* 1371, pages 1388-1391.

may not be sufficient under some antitrust regimes.³¹ Indeed, in cases where the European Court of Justice has applied Article 102(c) TFEU, it has predominantly concerned business-to-business price discrimination.³²

Data as a currency and privacy concerns

Another type of potentially exploitative practice concerns the transfer and protection of personal data. In a growing number of digital markets, particularly social media, firms provide services to consumers in exchange for their personal data. If data are a commodity like any other, then this exchange would constitute a form of payment, but it is not clear how antitrust law applies to such practices. The European Court of Justice, for instance, has held that issues concerning the sensitivity of personal data are not "*as such*" a matter for competition law, but may instead be resolved on the basis of the relevant rules governing data protection.³³ The European Commission has also followed a similar approach in its *Facebook/WhatsApp* merger decision.³⁴

However, it has now been suggested that Article 102(a) TFEU, which has traditionally been applied in cases involving excessive pricing, would also apply in cases of "*excessive trading conditions*" when consumers are presented with onerous terms and conditions that may breach data privacy regulations.³⁵ Last year, the German national competition authority initiated antitrust proceedings against Facebook, on suspicions that it has abused its dominant position by infringing data protection rules.³⁶ More recently, the European Commission has accepted the quality of data protection as an "*important parameter of competition*" in the context of its *Microsoft/LinkedIn* merger decision.³⁷ As the digital economy continues to develop, data protection concerns are likely to become a recurring theme in future competition investigations. However, given that competition objectives and data protection objectives are not automatically commensurate, guidance from antitrust enforcement authorities is needed to understand how competing objectives should be balanced and, in particular, how the human right to privacy should be reconciled with the European Commission's application of a consumer welfare standard in antitrust cases.³⁸

Big Data as a source of market power

A third area of concern encompasses circumstances where dominant firms can use data to acquire potential rivals or otherwise engage in exclusionary practices by distorting the competitive process. As noted above, the European Commission has already considered whether the pooling of data raised competition concerns in *Facebook/WhatsApp* and *Microsoft/LinkedIn*.³⁹ However, critics of Facebook's acquisition of WhatsApp argued that this was an example of a "*shoot-out acquisition*" with the aim of eliminating a potential future rival.⁴⁰ Artificial intelligence could exacerbate the challenges of merger control, by allowing dominant firms to identify and acquire start-ups at the earliest stages of their development (before they could be considered 'competitors'). Accordingly, antitrust enforcement authorities will need to apply greater when requesting information to understand a firm's rationale for entering into an acquisition. Facebook has recently been fined by the European Commission for giving misleading information on how it intended to use WhatsApp's

³¹ Joint report of the Bundeskartellamt and Autorité de la concurrence, 'Competition Law and Data' (10 May 2016), page 22.

³² Richard Whish, *Competition Law* (Oxford University Press, 2015), pages 802-806.

³³ Case C-238/05, *Asnef-Equifax v Ausbanc* [2006] ECR I-11125, paragraph 63.

³⁴ European Commission, COMP/M.7217, *Facebook/WhatsApp* (2014), paragraph 164.

³⁵ Bundeskartellamt and Autorité de la concurrence, *Competition Law and Data* (n31), page 25.

³⁶ Press release, 'Bundeskartellamt initiates proceeding against Facebook on suspicion of having abused its market power by infringing data protection rules' (2 March 2016) (accessible at: https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2016/02_03_2016_Facebook.html).

³⁷ European Commission, COMP/M.8124 *Microsoft/LinkedIn* (2016), paragraph 350.

³⁸ Christopher Kuner, Fred Cate, Christopher Millard, Dan Jerker Svantesson and Orla Lynskey, 'When two worlds collide: the interface between competition law and data protection' (2014) *International Data Privacy Law* 247, 248.

³⁹ European Commission, *Facebook/WhatsApp* (n34), paragraphs 184-190; European Commission, *Microsoft/LinkedIn* (n37), paragraph 176.

⁴⁰ The Economist, *The world's most valuable resource* (n28).

data, although the European Commission has insisted that this has not affected the underlying analysis of its clearance decision in 2014.⁴¹

In any case, *ex ante* merger control cannot prevent firms from acquiring dominance through their own success. Therefore, dominant firms with access to Big Data could still use that data as part of a leveraging strategy to engage in a number of exclusionary practices, for example, by refusing to provide access to data to competitors, or by tying access to data with other contractual requirements. A joint report by the French and German national competition authorities has considered how such practices are *prima facie* assessable with reference to existing Article 102 TFEU case law, however, there is scope for more novel exclusionary practices.⁴² The European Commission's recent infringement decision against Google in relation to its online search services is likely to be edifying in this regard (the published decision is awaited).⁴³

Rise of the antitrust machines?

At present, any liability concerns surrounding the application of artificial intelligence in digital markets is likely to be overstated, because most instructions undertaken by algorithms employed in such markets are attributable to human computer programmers. However 'deep learning algorithms', which have the potential for 'self-learning', will have the ability to create their own instructions which could break the causal link between the original human programmer and an anti-competitive market practice.⁴⁴ For example, without instructions to the contrary, a deep learning algorithm designed to "increase profit" could decide that the best profit-maximisation strategy is a hardcore price-fixing cartel.

EU Commissioner Vestager's response to this phenomenon would appear to be 'no dice', having recently advocated a strict liability approach warning that "companies can't escape responsibility for collusion by hiding behind a computer program".⁴⁵ However, the question of robotic liability cuts across numerous fields of law, and the European Parliament has recently called for the EU Commission to propose EU-wide liability rules for robots and artificial intelligence.⁴⁶ Although it remains to be seen exactly how artificial intelligence will interact with the digital firms of the future, a strict liability approach is a sensible option. After all, if robots can be taught to maximise profit, they can also be taught competition law (the same cannot be said for all humans).

Conclusion

The digital economy is evolving at rapid pace, and artificial intelligence and Big Data are the twin-pillars driving that transformation. This short essay has attempted to illustrate that some of these developments strike at the root of fundamental antitrust concepts, from the definition of an agreement to the interaction between competition law and other policy objectives.

However, antitrust enforcement authorities also have the opportunity to use the same technologies to their advantage. The Korean Fair Trade Commission, for instance, has already implemented computer software designed to identify cases of bid rigging.⁴⁷ Given the widespread availability of

⁴¹ European Commission, 'Commission fines Facebook €110 million for providing misleading information about WhatsApp takeover - Press release' (18 May 2017) (accessible at: http://europa.eu/rapid/press-release_IP-17-1369_en.htm).

⁴² Bundeskartellamt and Autorité de la concurrence, *Competition Law and Data* (n31), pages 17-20.

⁴³ European Commission, 'Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to own comparison shopping service – press release' (27 June 2017) (accessible at: http://europa.eu/rapid/press-release_IP-17-1784_en.htm).

⁴⁴ OECD, *Competition Policy in the Digital Age* (n9), page 41.

⁴⁵ Speech by Margrethe Vestager at the Bundeskartellamt 18th Conference on Competition, Berlin (16 March 2017) (accessible at: https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/bundeskartellamt-18th-conference-competition-berlin-16-march-2017_en).

⁴⁶ European Parliament, 'Robots and artificial intelligence: MEPs call for EU-wide liability rules – press release' (16 February 2017) (accessible at: <http://www.europarl.europa.eu/news/en/press-room/20170210IPR61808/robots-and-artificial-intelligence-meps-call-for-eu-wide-liability-rules>).

⁴⁷ OECD, *Competition Policy in the Digital Age* (n9), page 13.

price monitoring software, there is no reason why antitrust enforcement authorities cannot use the same technology to monitor pricing practices in digital markets. This could explain the European Commission's call for a tender, published last month, for consultancy services on "*artificial intelligence applied to competition enforcement*" and to "*provide advice on the way forward*".⁴⁸

Word count: 2,469.

⁴⁸ COMP/2017/017, 'Consultancy "Artificial Intelligence Applied to Competition Enforcement"' (22 September 2017) (accessible at: http://ec.europa.eu/competition/calls/exante_en.html).