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Peers or Professionals?

The P2P-Economy and Competition Law

Sofia Ranchordás*

For almost a decade, digital peer-to-peer initiatives (eg, Uber, Airbnb) have been disrupting the traditional economy by offering informal, diverse, convenient and affordable services to consumers. However, more recently, the peer-to-peer economy has become increasingly professionalised. Service providers in the ride and home-sharing sectors feel significant pressure to offer services similar to those of professionals, practise the low or high prices suggested by algorithmic pricing tools, and show at all times professionalism. This shift towards professionalisation has been accompanied by regular information exchanges between service providers and platforms as well as by the growing use of algorithmic pricing. This article analyses first the evolution of the sharing economy from a peer-to-peer system that benefited from initial regulatory leniency due to its sustainable and informal goals, to a quasi-professional economy where users are driven by profit making and the need to receive excellent rating and reviews. Second, it provides a preliminary analysis of the potential competition concerns that might arise as information exchanges and pricing tools become more common in the platform economy. This article contributes to the existing literature by discussing the challenges of enforcing existing competition law tools in an algorithmic context.

I. Introduction

‘Do-it-yourself’ (DIY) has become a commonplace in the digital age. The emergence of the digital sharing economy, novel technologies (eg, user-friendly smartphone applications), and the broad sharing of information on the Internet (eg, online tutorials) have made us believe that we can do anything by ourselves and share it with our peers.¹ Or at least we would like to think so. The peer-to-peer (P2P) economy is cur-

rently present in a multitude of sectors from handmade crafts (eg, Etsy), crowdfunding (eg, Kickstarter), ride (eg, Uber), food (eg, Eatwith) to home-sharing (eg, Airbnb).² Peers—or, more accurately, prosumers—have replaced or significantly complemented the services of professionals in more than a dozen markets in the last years.³ Indeed, the sharing economy as well as a number of other citizen initiatives illustrate the broader shift from a professional or expert-based model to a P2P-economy.⁴

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1 For an analysis of this phenomenon in the sharing economy, Liran Einav, Chiara Farronato and Jonathan Levin, ‘Peer-to-Peer Markets’ (2016) 8 Annual Review of Economics 615; Yochai Benkler, ‘Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production’ (2004) 114 Yale Law Journal 273; Orly Lobel, ‘The Law of the Platform’ (2016) 101 Minnesota Law Review 87; see also my previous work Sofia Ranchordás, ‘Does Sharing Mean Caring? Regulating Innovation in the Sharing Economy’ (2015) 16(1) Minnesota Journal of Law, Science & Technology 413.

2 See, eg, Cristiano Codagnone and Bertin Martens, ‘Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues’ (Institute for Prospective Technological Studies Digital

Economy Working Paper 2016/01, JRC100369, 2016) <https://ssrn.com/abstract=2783662> accessed 30 December 2017; Karolina Zurek, ‘Food-sharing in Europe: Between Regulating Risks and the Risks of Regulating’ (2016) 7 European Journal of Risk Regulation 675; Rainer Lenz, ‘Peer-to-Peer Lending: Opportunities and Risks’ (2016) 7 European Journal of Risk Regulation 688.

3 George Ritzer, ‘Prosumer Capitalism’ (2015) 56 The Sociological Quarterly 413.

4 Other examples of citizen initiatives are citizen journalism, see, for example, Ian Cram, *Citizen Journalists: Newer Media, Republican Moments and the Constitution* (Edward Elgar 2015); Valérie Bélair-Gagnon and CW Anderson, ‘Citizen Media and Journalism’ in Robin Mansell and Peng Hwa Ang (Eds), *The International Encyclopedia of Digital Communication and Society* (Wiley 2015) 1; citizen science (see, for example, Rick Bonney et al, ‘Citizen Science: A Developing Tool for Expanding Science Knowledge and Scientific Literacy’ (2009) 59 BioScience 977; Janis L Dickinson and Rick Bonney (Eds), *Citizen Science: Public Participation*

The shift to a P2P-economy can be partially explained by the gradual disenchantment with the reign of the experts and political and business elites, particularly since the 2008 financial crisis.⁵ This also helps us understand why Millennials appear to trust P2P-services and user-generated content and perceive it as more 'authentic,' relatable, less biased and objective than those of licensed professionals.⁶

In the last three years, the P2P-economy has changed significantly. Despite the informal appearance of the new P2P-economic model, there are signs that this sector is becoming increasingly professionalised.⁷ Home-sharing hosts currently feel pressure from platforms and their peers to offer lower prices and provide high-standard services in order to keep attracting new guests. The 'Superhost' does not engage in conversations with guests or ask them to take care of her pets. Rather, she rolls bath towels, offers free coffee and tea, hides personal objects, and is available 24/7 as a hotel manager would be.⁸ This change of course is also visible in the food-sharing sector where platforms such as Eatwith and Feastly are also welcoming a large number of professionally trained cooks who offer skilful and sophisticated meals at the prices of high-end restaurants.⁹ In this context, it is not surprising that several Airbnb hous-

es are starting to look like hotels and that not much is left of the promised land of sharing and diversity.¹⁰ As the dividing line between peers and professionals starts fading away in the P2P-economy, the regulatory leniency that the sharing economy has thus far benefited from, might need to be rethought.¹¹

The fast development of P2P-markets has been thus far facilitated not only by the existence of grey areas in regulation but also by the limited enforcement of the rules applicable to comparable commercial services.¹² While some policy changes are already visible, several national and local regulators have thus far not seen the need to enforce authorisation schemes in the case of P2P-markets and have thus devoted little attention to practices that could otherwise be regarded as suspicious from both regulatory and competition law perspectives.¹³ This is the case of the unlicensed provision of professional services and the information exchanges that currently appear to take place between service providers and platforms. Considering the changes that the P2P-economy is undergoing, this article discusses the need to analyse these subjects in the context of the growing professionalisation of services.

Although P2P-services raise in theory both regulation and competition concerns, several of the typi-

in *Environmental Research* (Cornell University Press 2012); Frank Fischer, *Citizens, Experts, and the Environment: The Politics of Local Knowledge* (Duke University Press 2000); democratic participation initiatives such as crowdsourcing legislation (see, for example, Tanja Aitamurto and Kaiping Chen, 'The Value of Crowdsourcing in Public Policymaking: Epistemic, Democratic and Economic Value' (2017) 5 *Theory and Practice of Legislation* 55) or the longstanding neighborhood watches.

5 See, eg, Luigi Guiso, 'Trust and Risk Aversion in the Aftermath of the Great Recession' (2012) 13 (2) *European Business Organization Law Review* 195;

6 Jose van Dijck, *The Culture of Connectivity: A Critical History of Social Media* (Oxford University Press) 11-12.

7 While social dining appeared to be based on the idea of connecting strangers around home-cooked meals, food-sharing platforms and hosts appear to have reshaped their ambitions, particularly due to the limited popularity of these services. As many guests feel reluctant to eat at strangers' houses as they are concerned with sanitary and food safety issues, platforms have tried to introduce professionals in this P2P-sector, see Stephanie Clifford, 'Willing to Cook for Strangers, but Guests Are Harder to Find' *New York Times* (5 May 2017) <https://www.nytimes.com/2017/05/05/technology/airbnb-social-dining-apps.html> accessed 30 December 2017.

8 Airbnb, '10 Simple Tips to Attract More Guests from a Home Staging Expert' <<https://blog.atairbnb.com/attract-guests-10-simple-tips-home-staging-expert-meridith-baer/>> accessed 17 December 2017.

9 For example, on the platform Eatwith in San Francisco, one of the cities with the largest number of hosts and menus available (over 160), a large number of hosts introduce themselves by

reference to professional elements: for example, as cooks 'trained in France' or in Japan, 'professional chefs', 'hospitality producers', or 'Parisian patisseries'. See the San Francisco page at www.eatwith.com accessed 2 January 2018. The website Feastly also shows elements of professionalisation, for example, by offering not only home-cooked dinners but also 'dream venues' for 'birthdays, corporate dinners, reunions' and other events (see the homepage at www.Feastly.com accessed 02 January 2018).

10 David Stallibrass and John Fingleton, 'Regulation, Innovation, and Growth: Why Peer-to-Peer Businesses Should Be Supported' (2016) 7(6) *Journal of European Competition Law & Practice* 414, 415; European Parliamentary Research Service, *The Cost of Non-Europe in the Sharing Economy. Economic, Social and Legal Challenges and Opportunities* (European Parliament 2016).

11 Kellen Zale, 'When Everything is Small: The Regulatory Challenge of Scale in the Sharing Economy' (2016) 53 *San Diego Law Review* 949 (challenging the regulatory leniency given to small-scale activities).

12 Frank Pasquale, 'Two Narratives of Platform Capitalism' (2016) 35 *Yale Law & Policy Review* 309.

13 The European Commission has highlighted in this context the benefits of the sharing economy and the proportionality requirement that authorisation schemes must abide by, see Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions, *A European Agenda for the Collaborative Economy*, COM(2016), 356 final. Local regulators in once lenient cities (for example, Amsterdam) have nonetheless become stricter due to growing nuisance complaints and the rising prices of real estate.

cal competition law instruments have not been considered well-suited for the P2P-economy.¹⁴ Indeed, competition and sector-specific regulation were designed for professionals and business-to-consumer (B2C) relationships and aimed to sanction primarily the misconducts of firms or their directors (eg, price fixing, cartels). In the P2P-economy, the subjects of regulation were originally not professionals but often peers who were simply ‘sharing an air mattress to make ends meet.’ In addition, in the P2P-economy any potential collusion appears to result from the use of algorithms and not directly from human action.¹⁵

This article delves into the legal implications of the increasing professionalisation in the P2P-economy and analyses the triangular relationship between platforms and users. In this context, I explore the definition of ‘professional’ in the P2P-economy, analyse different ways in which the P2P has become professionalised, and inquire into the difficulty of determining which rules should apply to quasi-professional services. In this article, I also review the literature and case law that has delved into the application of competition laws to P2P-platforms. The fluid and digital character of the P2P-economy, the use of obscure pricing algorithms, the controversial qualification of service providers as single economy units (independ-

ent contractors) or employees, and the multi-sided structure of markets have complicated the task of competition law scholars. This article sheds some light into these issues but considering the lack of data concerning some crucial aspects of the functioning of platforms and their algorithms, it leaves further conclusions regarding the violation of EU competition law to future research.

This article is organised as follows. Section II discusses the limits of the definition of the sharing or P2P-economy and explains how the professionalisation of these services is reshaping the definition of the P2P-economy. Section III delves into the potential competition concerns raised by the P2P-economy, in particular the information exchanges between different parties and the use of algorithmic pricing.

II. The P2P-Economy

The essence of the sharing economy and P2P-transactions can be found in the social relations between users.¹⁶ The idea underlying these transactions is as old as mankind: sharing underused goods with others in order to establish and reinforce networks.¹⁷ As this section explains, the P2P-economy has nonetheless grown to become much more than a form of sharing underutilised goods.

1. Definition

The terms ‘P2P’ and ‘sharing economy’ appear to have acquired the status of a new business model where anyone can be a service provider.¹⁸ Although there is not a commonly accepted definition of the sharing economy, the original idea underlying these transactions appeared to have referred to a sustainable allocation of idle capacity.¹⁹

Pioneer scholars in the field of the sharing economy such as Rachel Botsman have therefore insisted on distinguishing between different forms of collaborative transactions from the very beginning.²⁰ According to Botsman, the term ‘sharing economy’ would only encompass the services of platforms that ‘facilitate the sharing of underused assets or services, for free or for a fee, directly between individuals or organizations.’ The ‘Peer-to-peer economy’ would refer to ‘systems that connect buyers and sellers facilitating the exchange of assets directly between indi-

14 Vassilis Hatzopoulos and Sofia Roma, ‘Caring for Sharing? The Collaborative Economy under EU Law’ (2017) 54 Common Market Law Review 81, 109; Niamh Dunne, ‘Competition Law (and its Limits) in the Sharing Economy’ in Nestor Davidson, Michèle Finck and John Infranca (Eds), *Cambridge Handbook on Law and Regulation of the Sharing Economy* (Cambridge University Press 2018) (forthcoming).

15 Andreas Heinemann and Aleksandra Gebicka, ‘Can Computers Form Cartels? About the Need for European Institutions to Revise Concertation Doctrine in the Information Age’ (2016) 7(7) Journal of European Competition Law & Practice 431.

16 Mariana Zuleta Ferrari, ‘Beyond Uncertainties in the Sharing Economy: Opportunities and Risks for Social Capital’ (2016) 7(4) European Journal of Risk Regulation 664.

17 Russell Belk, ‘You Are What You Can Access: Sharing and Collaborative Consumption Online’ (2014) 67 Journal of Business Research 1595.

18 Alex Stephany, *The Business of Sharing: Making it in the New Sharing Economy* (Palgrave Macmillan 2015).

19 Cristiano Codadogne and Bertin Martens, ‘Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues’ (European Commission, Institute for Prospective Technological Studies Digital Economy Working Paper 2016/01, 2016) JRC100369.

20 Rachel Botsman, ‘The Sharing Economy: Dictionary of Commonly Used Terms’ <<https://rachelbotsman.com/work/the-sharing-economy-dictionary-of-commonly-used-terms/>> accessed 30 December 2017; See also Rachel Botsman and Roo Rogers, *What’s Mine is Yours—The Rise of Collaborative Consumption* (HarperCollins 2010).

viduals' and the collaborative economy to 'systems that unlock value from underused assets by matching 'needs' and 'haves' in ways that bypass traditional intermediaries and distribution channels.' Many platforms (eg, Blablacar) fall into different categories, while others (eg, Uber) are simply examples of the so-called 'on-demand' or 'gig-economy.' In the last years the sharing economy has been defined in contradictory terms, ranging from the perception that it is a pathway to a decentralised, equitable, and sustainable economy and the criticism that it creates unregulated marketplaces dominated by powerful platforms.²¹

The European Commission has opted for the term 'collaborative economy' understood as 'business models where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals.'²² This broad definition encompasses multiple peer-to-peer services that offer on-demand access to assets or services. This access is possible due to the existence of a triangular relationship between demand, platform, and supply.²³ In this article, the term P2P-economy will be used to refer to transactions between unlicensed individuals and consumers through a digital platform which involve the temporary usage of a good or an on-demand service. While this term overlaps with the definition of the sharing economy, it also emphasizes the contrast between peers and professionals.

In the P2P-economy, digital platforms perform a key role. They establish direct contact with users and prosumers, process bookings, payments, complaints as well as information regarding the reputation of users and prosumers.²⁴ Platforms do not only operate as neutral intermediaries or advertisement hosts. Rather, they reshape economic exchanges, 'datafy' every single aspect of the transaction, and make themselves indispensable for parties in target markets.²⁵ Their success depends on the reliability and quality of the services provided, which means that they have a strong incentive to control quality and decrease 'amateurism' in the P2P-economy.

2. Peers or Professionals?

In January 2014, Brian Chesky, the CEO Airbnb, stated in an interview for the Wall Street Journal: 'there were laws created for businesses, and there were laws

for people. What the sharing economy did was create a third category: People as businesses.'²⁶ This statement might define the essence of the sharing economy but it does not fully reflect the evolution of the sector from the original concept (sharing a room) to the current reality (eg, luxury apartments managed by professional companies).

In the last years, the reality in the P2P-economy started changing. Nowadays, several peers (eg, Super Airbnb hosts) try to offer a quasi-professional experience which could easily be compared to aparthotels.²⁷ Also, the diversity of experiences does not always appear to be valued by platforms, even though it remains part of their original marketing. To illustrate, in 2015, Uber Support expressed its concerns on Twitter regarding an Uber driver who, according to a picture distributed on this social media platform, had brought her child along as she did not have any other babysitting option.²⁸ In a world where Uber is not a professional taxi-service but a ride-sharing initiative, this should not be a problem and would instead be 'part of the P2P-experience.'²⁹ However, this and other less professional attitudes are no longer valued in an increasingly professionalised P2P-econ-

21 Chris J Martin, 'The Sharing Economy: A Pathway to Sustainability or a Nightmarish form of Neoliberal Capitalism' (2016) 121 *Ecological Economics* 149, 154.

22 Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions, A European Agenda for the Collaborative Economy, COM(2016), 356 final.

23 See Marina Krakovsky, *The Middleman Economy: How Brokers, Agents, Dealers, and Everyday Matchmakers Create Value and Profit* (Palgrave MacMillan 2015).

24 David S Evans and Michael Noel, 'Defining Markets that Involve Multi-Sided Platform Businesses: An Empirical Framework with an Application to Google's Purchase of DoubleClick' (Reg-Markets Center, Working Paper No 07-18, 2007) SSRN: <<https://ssrn.com/abstract=1089073>> or <<http://dx.doi.org/10.2139/ssrn.1089073>>.

25 Julie E Cohen, 'Law for the Platform Economy' (2017) 51 *U C Davis Law Review* 133, 145.

26 Andy Kessler, 'Brian Chesky: The 'Sharing Economy' and its Enemies', *Wall Street Journal* (17 January 2017) <<https://www.wsj.com/articles/brian-chesky-the-8216sharing-economy8217-and-its-enemies-1390003096>> accessed 14 December 2017.

27 Sai Liang et al, 'Be a "Superhost": The importance of badge systems for peer-to-peer rental accommodations' (2016) 60 *Tourism Management* 454.

28 For a reconstruction of the Twitter history, see Gabe Bergardo, 'Uber Tried to Make this Guy Snitch on a Driver who Brought her Kid along', *Daily Dot* (14 January 2016) <<https://www.dailydot.com/unclick/uber-driver-kid-meme/>> accessed 30 December 2017.

29 See pt 3 for the discussion of the recent case C-434/15 *Asociación Elite Taxi* [2017] ECLI:EU:C:2017:981.

omy. As the number of service providers grows, service providers must have five-star-ratings and excellent online reviews which often result from providing services that live up to the standards of professionals.³⁰ It is thus not surprising that several cities have struggled with the growing number of professional companies (sometimes up to 30% of listings) that use digital platforms such as Airbnb and Booking.com to offer their services. These professionals do not abide by rules that are typically applicable to hotels, short-stay apartments, and B&Bs but rely upon the lenient regulatory framework (eg, no licenses or registration requirements up to sixty nights of home-sharing) or regulatory uncertainty that characterizes P2P-markets in many cities throughout the world.

One of the most challenging aspects of the growing professionalisation of the sharing economy resides in the lack of a common definition of 'professional.' Is it someone who exercises a profession for which she studied or followed extensive training? Or someone who provides specific services on a full-time basis? Is it sufficient to go over the maximum threshold (eg, 60 days in Amsterdam) to become a professional? Or is a professional someone who provides services at the same level as a licensed trader and is viewed by consumers as an alternative to a traditional service provider? Establishing when a peer becomes a professional is important for a number of reasons: first, it might help determine whether the peer competes in the same market with a licensed professional; second, it is essential to establish which

regulatory system is applicable to the peer once she achieves the status of 'professional.' For example, professional hospitality services must comply with numerous safety regulations, while sporadic Airbnb hosts are not required, for example, to have a fire escape route.

As the European Commission points out in the Communication 'An European Agenda for the Collaborative Economy,' EU legislation does not establish expressly at what point a prosumer becomes a 'professional' in the sharing economy.³¹ Most Member States employ sector-specific definitions that might take into account a number of requirements.³² For example, a professional might be someone who provides services against remuneration and a peer is someone who is only compensated for her costs but does not make any profit. In the home-sharing sector, the definition of professional is associated with different thresholds such as the level of income generated or the regularity with which the service is provided.

Given the growing professionalisation of the sharing economy, it is important to raise greater awareness for the need to distinguish between P2P-transactions that allow users to share underused goods with others in a genuine way and unlicensed individuals who behave like hotel managers.³³ This behaviour is promoted by several official and non-official 'Superhost' communities that share information on how to display the appearance of professionalism as well as by the current system put in place by platforms.³⁴ Three features of this system are driving the professionalisation trend: first, the 'guidelines' provided by platforms to prosumers which urge them to improve their facilities and services in order to attract more guests; second, the online rating and reputational system; third, the use of algorithmic pricing.

We can consider the home-sharing sector for the first element. Airbnb shares 'tips' with hosts on how to make the most out of their homes (eg, hide personal items, hang stylish paintings, 'learn from hotel bathrooms' how to roll towels, maintain counters free and clean, adorn with flowers).³⁵ If the original idea of the sharing economy is to offer genuine and reliable experiences, where do these professional tips fit? If all houses look like hotels and individuals will behave like professionals, can they still be considered 'peers'? The guidelines provided by Airbnb or other platforms are not binding. Hosts are free not to com-

30 Georgios Zervas, Davide Proserpio and John W Byers, 'A First Look at Online Reputation on Airbnb, Where Every Stay is Above Average' (SSRN, 2015) <<https://ssrn.com/abstract=2554500>> accessed 30 December 2017.

31 Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions, A European Agenda for the Collaborative Economy (2016) COM(2016), 356 final.

32 *ibid.*

33 See also Sofia Ranchordás, 'On Sharing and Quasi-Sharing: The Tension between Sharing-Economy Practices, Public Policy, and Regulation' in Pia A Albinsson and B Yasanthi Perera (Eds), *The Rise of the Sharing Economy: Exploring the Challenges and Opportunities of Collaborative Consumption* (Praeger 2018) 263.

34 See, for example, the official Superhost webpage created by Airbnb: <https://www.airbnb.com/superhost>. There are local Superhost communities, weblogs, Facebook groups, and meetups where hosts can meet each other and share experiences.

35 Airbnb, '10 Simple Tips to Attract More Guests from a Home Staging Expert' <<https://blog.airbnb.com/attract-guests-10-simple-tips-home-staging-expert-meridith-baer/>> accessed 17 December 2017.

ply with this professionalisation trend but this might come at a cost.

In 2017, the New York Times interviewed several Airbnb hosts and concluded that hosts feel pressure to professionalise their services.³⁶ Although these interviews cannot be taken into account as empirical evidence, they illustrate this phenomenon which is also visible in multiple social media communities. This is particularly worrisome as hosts are dependent on the platform to rent their houses and, despite the abundance of online alternatives, Airbnb remains the largest home-sharing intermediary. Moreover, prosumers in the sharing economy do not have direct contact with users which means that prospective customers decide on who to hire on the grounds of their ranking on the listings, price and location, and online reviews.

Although online rating and reputational mechanisms have been praised both by the Federal Trade Commission and the European Commission for making information available, they are also flawed at many levels.³⁷ In this article, I underline one of these flaws: the entry barriers erected by the reputational system.³⁸ With the current pressure to perform like a Superhost or have a five-star-evaluation, new actors face greater market barrier to entry. As reputation tends to be cumulative, new entrants can only compete with existing Superhosts and attract new customers if they offer low prices. While this is true for many other sectors, this feature is enhanced by the fact that the quality control of this sector only occurs ex post and is solely placed in the hands of online users. This means that new entrants might have to make losses in order to compete with established

hosts. This practice should not make sense in an alternative economy which emerged as a way 'to make ends meet' by sharing idle capacity.

A third sign of the professionalisation of the P2P-economy can be found in the growing use of automatic pricing tools that can be purchased by users to determine the optimal prices of their accommodation. Tools such as Beyond Pricing import the client's Airbnb or VRBO listings and calculate the best price for a certain date.³⁹ Airbnb also has its own pricing tool (Aerosolve) which takes into account local demand and competition to suggest hosts the price they should charge.⁴⁰ Hosts are free to deviate from this suggestion but they incur the risk that their close competitors will lower the prices as suggested by the platform. Online 'Superhost communities' tend to advise hosts to keep a close watch on the price of new entrants, hotels, and other established hosts.⁴¹ In these online communities, hosts also discuss the prices of accommodation and the pricing suggestions given by Airbnb.⁴²

The use of these algorithms aligned with the constant exchange of information between service providers and platforms in an increasingly professionalized economy raise a number of competition concerns.

III. Competition Concerns

At first sight, digital platforms appear to improve competition: online markets are dynamic, algorithms offer greater transparency and ensure a better match between supply and demand, and the new

36 Katie Benner, 'Airbnb Tires to Behave More like a Hotel' *New York Times* (17 June 2017) <<https://www.nytimes.com/2017/06/17/technology/airbnbs-hosts-professional-hotels.html>> accessed 17 December 2017.

37 Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions, 'A European Agenda for the Collaborative Economy' (2016) COM(2016), 356 final <<https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-356-EN-F1-1.PDF>> accessed 30 December 2017; Federal Trade Commission, The 'Sharing' Economy: Issues Facing Platforms, Participants & Regulators, An FTC Staff Report (2016) <https://www.ftc.gov/system/files/documents/reports/sharing-economy-issues-facing-platforms-participants-regulators-federal-trade-commission-staff/p151200_ftc_staff_report_on_the_sharing_economy.pdf> accessed 30 December 2017. For a critical appraisal of this system, see Frank Pasquale, 'Reforming the Law of Reputation' (2015) 47 *Loyola U of Chi L J* 515; Sofia Ranchordas, 'Online Reputation and the Regulation of Information Asymmetries in the Platform Economy' (2018) *Critical Analysis of Law* (forthcoming); Julia K Lee, 'Trust and Social Commerce' (2015) 77

University of Pittsburg Law Review 139; Laura Heymann, 'The Law of Reputation and the Interest of the Audience' (2001) 52 *Boston College Law Review* 1341.

38 See Giancarlo Spagnolo, 'Reputation, Competition, and Entry in Procurement' (2012) 30(3) *International Journal of Industrial Organization* 291.

39 More information on this tool can be found on the company's website: <<https://beyondpricing.com/>> accessed 17 December 2017.

40 Dan Hill, 'The Secret of Airbnb's Pricing Algorithms' (IEEE, 2016) <<https://spectrum.ieee.org/computing/software/the-secret-of-airbnbs-pricing-algorithm>> accessed 17 December 2017.

41 See, eg, the advice given on the following Airbnb-communities: <<https://airbnbhosting.co.uk/tips-on-how-to-boost-your-listing/>> accessed 17 December 2017; <<https://airhostsforum.com/t/superhost-burnout/7219>> accessed 17 December 2017.

42 See, eg, the discussion forum on the price tips provided by Airbnb, <<https://community.withairbnb.com/t5/Hosting/ridiculous-price-tips/td-p/48793>> accessed 17 December 2017.

business models eliminate entry barriers. However, appearances can also be deceiving here: first, platforms do not employ algorithms only for the sake of consumers but they also charge up to 20% of the price; second, market transparency is known to enhance the risk of collusion; and third, as the market power of platforms increases, service providers and consumers might have fewer available alternatives.⁴³ Besides the often heard issue of unfair competition, there might be other potentially anticompetitive practices in the P2P-economy in need of attention. This includes the development of strong networks susceptible to creating the 'winner-takes-all effect', the information exchanges between users and platforms as well as the use of big data, artificial intelligence, and pricing algorithms used in the context of the professionalisation of the P2P-economy.⁴⁴

Thus far, competition authorities have remained vigilant but little legal action has been taken against these practices in the P2P-economy.⁴⁵ This can be explained by three elements: first, the difficulty in proving the elements of anticompetitive agreements; second, the lack of evidence that the growing power of platforms causes negative harm to consumers; and third, the fact that traditional regulatory and antitrust toolkits might not be fully adapted to the challenges of algorithmic pricing and artificial intelligence.⁴⁶ Any antitrust investigation will have to start

by considering an important challenge: the multi-sided structure of the P2P-economy poses greater difficulties to the definition of the relevant market as actors interact via intermediaries.⁴⁷ In these multi-sided markets, the traditional small-but-significant-non-transitory increase in price (SSNIP) test might not always help us define the borders of the relevant market in a two-sided market as users on one side do not pay directly for the service but they use a platform that intermediates the payment and might apply surge pricing algorithms.⁴⁸ Second, in these markets with complex and often diverse services, it is also difficult to determine when users would substitute a traditionally licensed service by a P2P-transaction.⁴⁹

This section delves into the challenges of applying existing legal frameworks to three emerging competition issues in the P2P-economy: the qualification of service providers as single economic units; information exchanges; and the employment of algorithmic pricing.

1. Undertakings

In the European Union, Articles 101 and 102 of the Treaty on the Functioning of the European Union (TFEU) are applicable to single economic units which

43 See Ariel Ezrachi and Maurice Stucke, *Algorithmic Collusion: Problems and Counter-Measures* (OECD 2017) <<http://bit.ly/2qE0T7T>> accessed 17 December 2017; Ariel Ezrachi and Maurice Stucke, *Virtual Competition: The Promise and Perils of Algorithm-Driven Economy* (Harvard University Press 2016) 222-223, 236-237.

44 See generally on competition law and digital technologies Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of Algorithm-Driven Economy* (n 43); Maurice Stucke and Allen Grunes, *Big Data and Competition Policy* (Oxford University Press 2016). The argument has however been made that 'winner-takes-all' effect does not take place in the highly dynamic platform economy as network effects might not be long-lasting, see David Evans and Richard Schmalensee, 'Why Winner-Takes-All Thinking Doesn't Apply to the Platform Economy' (2016) Harvard Business Review <<https://hbr.org/2016/05/why-winner-takes-all-thinking-doesnt-apply-to-silicon-valley>> accessed 17 December 2017.

45 In 2016, the Polish Competition Authority declared however that Uber did not pose a threat to competition, see Aleksander Stawicki, 'Polish Competition Authority Declares that Uber Does Not Pose a Threat to Competition and Protection Of Consumer Interests' (*Kluwer Competition Law Blog*, 17 May 2016) <<http://competitionlawblog.kluwercompetitionlaw.com/2016/05/17/polish-competition-authority-declares-that-uber-does-not-pose-a-threat-to-competition-and-protection-of-consumer-interests/>> accessed 17 December 2017. The Italian Competition Authority has also been involved in this debate but has advocated mitigated regulation to reap the benefits of this innovative form of transportation, see Giovanni Pitruzella, 'Italy: Competition Authority'

Global Competition Review (14 August 2017) <<http://globalcompetitionreview.com/benchmarking/the-european-middle-eastern-and-african-antitrust-review-2018/1145582/italy-competition-authority>> accessed 17 December 2017.

46 For a broader perspective on the disconnect between regulation and technology, see Kenneth A Bamberger, 'Technologies of Compliance: Risk and Regulation in a Digital Age' (2010) 88 Texas Law Review 669.

47 For a thorough analysis of the challenges of market definition in the sharing economy, see Francesco Russo and Maria Luisa Stasi, 'Defining the Relevant Market in the Sharing Economy' (2016) 5(2) Internet Policy Review, DOI: 10.14763/2016.2.418. David S Evans, 'The Antitrust Economics of Two-Sided Markets' (2003) 20 (2) Yale Journal on Regulation 327; David S Evans and Richard Schmalensee, *Matchmakers: The New Economics of Multisided Platforms* (Harvard Business Review Press 2016). See also Vera Demary, 'Competition in the Sharing Economy' (IW Policy Paper, No 19/2015, 2015).

48 Francesco Russo and Maria Luisa Stasi, 'Defining the Relevant Market in the Sharing Economy' (2016) 5(2) Internet Policy Review, DOI: 10.14763/2016.2.418.

49 Niamh Dunne, 'Competition Law (and its Limits) in the Sharing Economy' in Nestor Davidson, Michèle Finck and John Infranca (Eds), *Cambridge Handbook on Law and Regulation of the Sharing Economy* (Cambridge University Press 2018) (forthcoming). For further elaboration on the interchangeability of P2P-services and licensed services, see *Illinois Transportation Trade Association et al v City of Chicago and D Burgess*, Nos 16-2009, -2077 and -2980 (7 October 2016).

are understood as 'the minimum combination of natural and legal persons able to exert a single competitive force on the market.'⁵⁰ This means that each economic operator must be able to 'determine independently the policy which it intends to adopt on the common market including the choice of persons and undertakings to which he makes offers and sells.'⁵¹ This qualification is independent of its legal status and of the way in which an undertaking is financed.⁵²

In the P2P-economy, the distinction between services is particularly challenging as it requires understanding the effective role of the platform in the transaction. Platforms argue that there are two types of economic activities: (a) the digital intermediation performed by the platform that generally does not provide any material services to consumers; and (b) the supply of the underlying service (home, food, ride or other sharing services).⁵³ However, while there are platforms that do not provide more than an advertisement and intermediation forum, the same is not true for others like Uber that control every single aspect of the service, even though they do not own any cars or officially employ any drivers. The recent judgment of the Court of Justice of the European Union, *Asociación Profesional Elite Taxi v Uber Spain*, shed more light on this matter.⁵⁴

At the outset of the *Uber Spain* case is a case brought by Elite Taxi in 2014 seeking a judicial declaration that Uber's activities infringed Spanish competition law, particularly the dispositions on misleading practices and acts of unfair competition. Uber's unfair competition resulted from the fact that it was providing transport services without the required administrative authorisation. This decision was dependent on the qualification of the services provided by Uber as transport services, information society services or a combination of both. Although the Court did not delve into the EU competition law question, this judgment helps us understand the relationship between the platform and its service providers. The Court decided that Uber exercises 'a decisive influence over the conditions under which that service is provided by those drivers.' It exercises a 'certain control over the quality of vehicles, the drivers, and their conduct,' it processes the payments, and it provides an application without which no transport services can be provided.⁵⁵ The Court concluded thus that 'the intermediation service must (...) be regarded as forming an integral part of an overall service and, accord-

ingly, must be classified (...) as 'a service in the field of transport'.⁵⁶

While there is a certain resemblance in the way in which platforms oversee service provision, each sector operates differently. For example, in the home-sharing sector, it might be more questionable whether Airbnb or Wimdu hosts currently form 'an integral part of an overall service.' The decision whether these individuals are separate undertakings implicates inquiring whether each service provider can determine its own business policy, carry financial risks, set their prices and use their own resources.⁵⁷ At the time of writing, this appears to be still the case in many home and food-sharing, despite the growing influence and market power of platforms. Uber is thus far the only judicially recognized exception. In the case of this platform, drivers carry all the financial risks and use their own assets, but they cannot act independently from the platform.

In conclusion, prosumers in the P2P-economy will in most cases be qualified as undertakings when providing the underlying service, except if the control exerted by the platform 'is so exorbitant as to exclude any initiative and risk-taking by the suppliers.'⁵⁸ This qualification depends on the casuistic analysis of their relationship with the platform.

2. Information Exchanges

Social media groups and forums, predictive analytics, and pricing platforms currently enable informa-

50 An individual can also be qualified as an undertaking, see, for example, Case C-35/83 *BAT Cigaretten-Fabriken GmbH v Commission* [1985] ECLI:EU:C:1985:32 and Case C-258/78 *Nungesser v Commission* [1982] EU:C:1982:211; For a thorough discussion of the concept, see Okeoghene Odudu and David Bailey, 'The Single Economic Entity Doctrine in EU Competition Law' (2014) 51 *Common Market Law Review* 1721, 1723.

51 Case C-40 to 48, 50, 54 to 56, 111, 113 and 114-73 *Coöperatieve Vereniging 'Suiker Unie' UA and others v Commission of the European Communities* [1975] ECLI:EU:C:1975:174.

52 Case C-41/90 *Höfner and Elser v Macrotron GmbH* [1991] ECLI:EU:C:1991:161.

53 Vassilis Hatzopoulos, *The Collaborative Economy and EU Law* (Hart 2018) 104.

54 Case C-434/15 *Asociación Profesional Elite Taxi v Uber Spain* [2017] ECLI:EU:C:2017:981.

55 *ibid.*, paras 39-40.

56 *ibid.*, paras 40 and 48.

57 See Case C-107/82 *AEG-Telefunken v Commission* [1983] ECLI:EU:C:1983:293.

58 Hatzopoulos (n 53) 105.

tion exchanges between users competing on the same market. However, not all information exchanges infringe EU competition law.⁵⁹ The dissemination of information and initiatives designed to create more transparency in the market may in many cases be pro-competitive (eg, if consumers are also aware of the information, if they allow suppliers to adapt and improve their production strategies).⁶⁰ However, information exchanges can constitute a concerted practice if they reduce the strategic uncertainty in the market and by doing so, facilitate collusion.⁶¹ Information exchanges in increasingly concentrated markets can help market actors coordinate and stabilise prizes or allocate customers.⁶²

Although there is still limited research on information exchanges in the P2P-economy, the collection and exchange of information could potentially become ancillary to another competition law infringement such as price fixing. In the last years, national competition authorities and the European Commission have devoted more attention to the exchange of information on online trading platforms and the dissemination of sensitive information on competitors on B2B platforms.⁶³

In the recent EU *Eturas* case, the Court of Justice was asked to analyse a case involving the investigation of 30 Lithuanian travel agencies that used an online booking system imposing discount rates. Although here an ‘old-fashioned’ message had been

sent to the agencies, it was still unclear whether the agencies participated in a concerted practice within the meaning of Article 101(1) TFEU.⁶⁴ The Court of Justice stated in the *Eturas* case that the travel agents that were aware of the content of the system notification could be presumed to have tacitly acquiesced, provided that the other elements essential to determine the existence of concertation were also met. These individuals had not distanced themselves from the platform’s practice. The Court underlined that if it cannot be established that a travel agency was aware of the message (for example, because it could prove that it had not received it), the participation in a concertation could not be inferred from the mere existence of a ‘technical restriction’ susceptible of facilitating collusive.⁶⁵ Rather, collusion can only be established on the grounds of ‘direct evidence or objective and consistent indicia that the parties tacitly assented to an anticompetitive action.’⁶⁶

In conclusion, looking back at the type of information exchanges in the P2P-economy it is difficult to establish whether they are part of a concerted practice. However, as information exchanges are used to feed algorithmic pricing and potential price fixing practices (see Section III.3), it is important for competition authorities to remain vigilant. The revelation of future pricing intentions—including in the form of an algorithm—can constitute highly sensitive commercial information. This includes agreements on a price structure or the publication of ‘a general rate increase’ which was recently investigated by the European Commission in the *Container Shipping* Decision.⁶⁷ The Commission was concerned with the fact that the announcement of this price increase would allow a number of shipping container companies to align their prices without incurring the risk of losing customers. The parties involved in this practice did not admit to having infringed any EU competition rules but accepted a number of commitments proposed by the European Commission pursuant to Article 9 of the Regulation (EC) No 1/2003.⁶⁸

3. Algorithmic Pricing

The use of complex pricing algorithms is not new in the digital economy. Online retailers have been employing pricing algorithms for years to consider competitors’ prices, an item’s popularity, and the data col-

59 See Case C-8/08 *T-Mobile Netherlands BV and others* [2009] ECLI:EU:C:2009:343.

60 Matthew Bennett and Philip Collins, ‘The Law and Economics of Information Sharing: the Good, the Bad, and the Ugly’ (2010) 6 European Competition Law Journal 311.

61 Communication from the Commission: Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ C 11.1.2011 (‘Horizontal Guidelines’), para 61.

62 Alison Jones and Brenda Sufrin, *EU Competition Law: Text, Cases, and Materials* (Oxford University Press 2016) 679; Antonio Capobianco, ‘Information Exchange Under EC Competition Law’ (2004) 41 Common Market Law Review 1247.

63 In the case of GF-XAir Freight Trading platform, the Commission cleared, nonetheless, this platform considering the efficiencies produced, see GF-X Air Freight Trading, D.Comm. (28 October 2002) IP/02/1560.

64 Case C-74/14 *Eturas UAB and others v Lietuvos Respublikos konkurencijos taryba* [2016] ECLI:EU:C:2016:42.

65 *ibid*, para 45.

66 *ibid*, para 45.

67 *Container Shipping* (Case COMP/AT. 39850) Commission Decision of 7 July 2016.

68 *ibid*.

lected on a consumer.⁶⁹ These pricing algorithms are susceptible of generating both competitive and anti-competitive effects.

On the one hand, pricing algorithms could promote a more efficient allocation of resources and ensure that consumers pay the lowest possible price considering their willingness to pay.⁷⁰ As Ezrachi and Stucke explain, in theory

the promise of online markets could free us from monopolies and gatekeepers (...) and unleash tremendous value as resources are used more efficiently, antitrust could become less relevant, as computers do not congregate in the same room to collude, and monopolies and cartels would be less durable given the low entry barriers.⁷¹

However, in practice, predictive analytics is just as good as the firms using it. This means that while price fixing previously took place in ‘smoke-filled rooms,’ it might now take place in data centres. In this context, it is important to understand how algorithms work and inquire into the horizontal and vertical restraints generated by pricing algorithms.⁷²

a. The Algorithms

As discussed in Section III.1, several P2P-platforms (eg, Uber, Airbnb, Task Rabbit) employ algorithms for different purposes such as to suggest or impose prices, organize listings, and process online ratings and reviews. When multiple users acquire the same pricing tool and connect their data to it, the algorithm will be able to anticipate the reaction of different firms and suggest higher prices.⁷³ This section addresses the pricing algorithms used by Uber and TaskRabbit.

Uber’s surge pricing algorithm changes prices according to supply and demand, raising prices to encourage more drivers to supply their services and earn additional income. Uber has insisted that surge pricing is not a form of price fixing but rather a market mechanism. It offers advantages to consumers as it helps reduce search costs, guarantees lower prices when there is more supply and as more drivers get on the road to supply their services, the surge pricing algorithm will increasingly lower the fees. Besides the well-known surge pricing system, Uber announced a new pricing strategy in 2017 for 14 US cities: it would charge some customers more using a ‘route-based pricing’ which would employ big data

to calculate the customer’s willingness to pay.⁷⁴ Uber’s pricing algorithm typically calculates fares using a combination of mileage, time, weather conditions and geographic demand. Price discrimination is a well-known and, in some cases, accepted business strategy. However, the use of personal data of customers might however raise legal issues, particularly if this strategy is expanded to the European context and involves the automated processing of personal data.⁷⁵

The extent to which platforms use algorithms varies upon their sophistication and degree of oversight. Although TaskRabbit allows each independent contractor to charge their own prices, the platform also has a ‘Quick Assign’ option—which is the only option available for those using the mobile application. The Quick Assign option predetermines the price of the service and assists the consumer in ‘getting the first available tasker.’ At the resemblance of Uber’s surge pricing, also here ‘the price can vary day to day and the goal is to maximise the opportunity for the task to be assigned to an available Tasker.’ Quick Assign sets the prices, regardless of the Tasker’s individual rate, which might be higher or lower. Although the use of algorithms is a modern practice, the agreement on a pricing structure raises increasing concerns that this could qualify as a new form of parallel conduct.⁷⁶

This article will not delve into the complexities of pricing algorithms as, without analysing the specific characteristics of each market, the underlying da-

69 Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of Algorithm-Driven Economy* (n 43) 8.

70 *ibid.*

71 Ezrachi and Stucke, *Virtual Competition: The Promise and Perils of Algorithm-Driven Economy* (n 43) 9-10.

72 *ibid.* 36.

73 Oxera, ‘When Algorithms Set Prices: Winners and Losers’ (Oxera Consulting, 2017) <https://www.regulation.org.uk/library/2017-Oxera-When_algorithms_set_prices-winners_and_losers.pdf> accessed 30 December 2017.

74 Biz Carson, ‘Uber May Charge You More Based on Where You’re Going’ *Business Insider* (20 May 2017) <<http://bit.ly/2AF17vh>> accessed 30 December 2017.

75 For a thorough discussion of the privacy implications of online pricing discrimination see Richard Steppe, ‘Online Pricing Discrimination and Personal Data: A General Data Protection Regulation Perspective’ (2017) 33 *Computer Law & Security Review* 768.

76 Joao Gata, ‘Sharing Economy, Competition, and Regulation’ (2015) *Competition Policy International* 1, 4 <<https://www.competitionpolicyinternational.com/assets/Europe-Column-November-Full.pdf>> accessed 30 December 2017.

ta, and computer code of each algorithm, it would be unwise to draw conclusions on their anti-competitive effects.⁷⁷

b. Vertical Restraints

The imposition of algorithmic pricing structures to service providers might bear some resemblance with well-known vertical practices such as most-favoured-nation (MFN), meet-the-competition (MTCs) or resale price maintenance (RPM). The first type of clauses may be imposed on service providers to guarantee exclusivity. This could happen if for example, Airbnb or Wimdu were to prohibit hosts from offering their services on other platforms.⁷⁸ The imposition of pricing algorithms bears more resemblance with the second type of clauses: RPM. RPM ensures that service providers practise the same resale price either by setting the price, prohibiting suppliers to lower their prices below a certain standard or recommending a price.⁷⁹ The provision of pricing guidelines can be found acceptable 'if there is no concerted practice between the parties for the actual application of prices.'⁸⁰ Therefore, the fact that Airbnb provides pricing guidelines can be deemed acceptable as long as Airbnb hosts retain the freedom of setting their own prices.⁸¹

Vertical restraints have received for years less attention than horizontal agreements. As the Chicago

School explained, vertical restraints often lead to increased sales, sanction free-riders, and achieve distributive efficiency.⁸² However, contracts that reference rivals and include MFN have been found to restrict competition in the past in the United States and raised similar concerns in Europe in the e-book sector.⁸³ As the oversight and price monitoring by platforms increases, platforms can easily monitor deviations from recommended prices. Not surprisingly, the European Commission declared the intention to pursue action against online vertical restraints in the future as the use of algorithmic pricing structures helps platforms influence price setting.⁸⁴

A key question that arises here is whether the vertical restraints restrict competition for the purposes of Article 101(1) and/or these restraints generate efficiencies cognisable under Article 101(3) that could offset these negative effects. The sharing economy was initially accepted because of its innovative potential. Contrary to offline price fixing, algorithmic pricing might have indeed positive outcomes for consumers as it allows for more accurate price adjustments, improves the matching of fluctuating demand and supply, which means that, in some cases, consumers might benefit from lower prices. Also, when algorithms respond to higher demand, consumers will probably see their demands being met more rapidly as there will be shorter waiting times for a ride during peak hours.⁸⁵ For example, in the case of Airbnb, the prices suggested by the algorithmic pricing tool might often be favourable to consumers as they might be lower than the price that the host would normally charge. It is important to underline that the four conditions set by the Guidelines on the application of Article 101(3) are cumulative. In other words, while its application to some algorithmic structures might not be excluded, it might be more difficult to justify it in the specific cases of TaskRabbit or Uber's pricing algorithms.⁸⁶ In conclusion, the use of complex algorithms can have numerous advantages but it can also be used for more than just guaranteeing the uniformity of services provided through the platform.

c. Hub-and-Spoke

Algorithms, when used in the platform economy, may also be employed to facilitate vertical agreements or collusion through a common vertical agent in the market: the platform. This has raised the ques-

⁷⁷ *ibid.*

⁷⁸ Hatzopoulos (n 53) 133.

⁷⁹ Case C-161/84 *Pronuptia de Paris GmbH v Pronuptia de Paris Irmgard Schilligalis* [1986] ECR 353; Case C-26/76 *Metro I* [1977] ECR 1875.

⁸⁰ *ibid.*, para 25.

⁸¹ Hatzopoulos (n 53) 134.

⁸² See Lester Telser, 'Why Should Manufacturers Want Fair Trade?' (1960) 3 *Journal of Law & Economics* 86; Richard Posner, 'The Next Step in the Antitrust Treatment of Restricted Distribution: Per Se Legality' (1981) 48 *University of Chicago Law Review* 1; William S Comanor, 'Vertical Price-fixing, Vertical Market Restrictions, and the New Antitrust Policy' (1985) 98 *Harvard Law Review* 983.

⁸³ *US v Apple Inc et al* 12 Civ 2862 (DLC) (filed 7 October 2013) (violation of s 1 of the Sherman Act). Apple appealed to the Second Circuit of the US Court Appeals but lost the case in 2015. In 2016 the Supreme Court declined to hear Apple's appeal. See however *E-books* (Case COMP/39.847) Commission Decision [2013] OJ C 378/25 (CRR clauses were not found incompatible with art 101 TFEU).

⁸⁴ European Commission, 'Final Report on the E-Commerce Sector Inquiry' COM (2017) 229 final.

⁸⁵ Oxera (n 73).

⁸⁶ Hatzopoulos (n 53) 138.

tion whether this could be qualified as a hub-and-spoke collusion. The identification of algorithm-driven hub-and-spoke collusion is particularly challenging as we currently do not have sufficient information about how pricing algorithms engage with service suppliers in the P2P-economy.

In a 'hub-and-spoke' collusion, the direct participants only interact via one common trading partner that is active on another upstream market.⁸⁷ In an algorithm-driven economy, the conspiracy can emerge when competitors outsource pricing to an identical algorithm or software to facilitate the stabilisation of prices and reduce competition.⁸⁸ However, it might be challenging to prove a hub-and-spoke cartel as the immediate goal of this type of conspiracy in the platform economy is not necessarily to generate horizontal collusion but it could be to monitor prices to ensure uniformity and optimise processes. For example, nowadays most companies use price optimisation software that relies on the same market data as it is too costly for each company to collect their own market data. The more companies adopt the software, the richer in information the database is. Companies use it to optimise production costs, negotiate with suppliers, and determine prices. Even though they might not have the intent to conspire through a platform hub, a natural result of the use of these algorithms will be the stabilisation of prices.

P2P-platforms also give rise to another form of hub-and-spoke conspiracies as the platform itself—rather than just the algorithm—might establish contact between sellers and purchasers and fix the price to dampen horizontal competition.⁸⁹ Platforms adjust the prices as the hub has strong incentives to police 'retailers.' At first sight, this might seem illogical as the platform should rather avoid any form of cooperation between downstream actors in order to increase its margins. The reality is nonetheless often different. The hub might be interested in facilitating horizontal agreements as equal prices and harmonised services might result in a higher number of sales.⁹⁰ Prices will not always be lower than the ones normally charged by individual retailers. Rather, as the examples of Uber and TaskRabbit show, the hub can also use the aggregated information to raise prices. Hub-and-spoke collusion works through an exchange of information between the hub and downstream actors. Even though the literature has argued that in some cases hub-and-spoke collusion can enhance consumer welfare, the impact of this type of agreements

in the sharing economy is still unclear as there is little transparency on what type of information is exchanged and how the pricing algorithms operate.⁹¹

The qualification of the vertical relationship between technology and service providers as a hub-and-spoke conspiracy implicates however the awareness of the likely effects of the informational flow. Competition authorities in the European Union will have to prove that the firms using algorithms or platforms as hubs for collusion intended to produce a clearly illegal result (eg, fix prices) or acted with knowledge of the probability of these illegal results or it must be clear that the algorithms were specifically designed to enable collusion. At the time of writing, it might seem challenging to identify in practice all the conditions for establishing a hub-and-spoke collusion. However, as the power of platforms increases and algorithms and artificial intelligence become more sophisticated and able to raise prices, competition authorities might be confronted with the need to identify when the use of an algorithm will no longer be legal.⁹²

Hub-and-spoke collusions are a rare sight in Europe. However, this type of collusion received attention in Europe as in 2016 as the Belgian Competition Authority imposed the highest fine in the country's history for a hub-and-spoke cartel in the supply and retail sector drugstore, perfumery, and hygiene (DHP) products.⁹³ Two cases from the United States involving pricing algorithms also show the growing relevance of this topic, despite their limited relevance for EU competition law. In 2015, a case involving al-

87 Lukas Solek, 'Passive Participation in Anticompetitive Agreements' (2017) 8(1) *Journal of European Competition Law & Practice* 15.

88 Ariel Ezrachi and Maurice E Stucke, *Virtual Competition: The Promises and Perils of the Algorithm-Driven Economy* (Harvard University Press 2016) 48-49.

89 *ibid* 50-51.

90 Nicolas Sahuget and Alexis Walckiers, 'A Theory of Hub-and-Spoke Collusion' (2017) 53 *International Journal of Industrial Organization* 353; Nicolas Sahuget and Alexis Walckiers, 'Hub-and-Spoke Conspiracies: The Vertical Expression of a Horizontal Desire?' (2014) 5(10) *Journal of European Competition Law & Practice* 711.

91 Sahuget and Walckiers, 'A Theory of Hub-and-Spoke Collusion' (n 90) 353.

92 Ezrachi and Stucke, *Virtual Competition: The Promises and Perils of the Algorithm-Driven Economy* (n 88) 55.

93 Evi Mattioli, 'Hub and Spoke: Towards a Belgian Precedent?' (2016) 7(4) *Journal of European Competition Law & Practice* 261. Office of Fair Trading, Case CE/3094-03, Decision of 26 July 2011; Belgium Competition Authority, Case 15-IO-19-AUD, Decision of 22 June 2015.

gorithmic price fixing was also discussed in the *United States v Topkins*.⁹⁴ In this case, Topkins was accused of having 'wr[itten] computer code that instructed' an 'algorithm-based software to set prices of the agreed-upon [merchandise to be sold via Amazon] in conformity with th[e] agreement' between the conspirators.⁹⁵ While this case did not proceed to trial, it helped draw attention to the new competition concerns arising with the emergence of algorithms, robo-selling, and the use of artificial intelligence to fix prices.⁹⁶ Uber also faced until recently a class action lawsuit instituted by Spencer Meyer against its former CEO (Travis Kalanick), for allegedly conspiring with drivers to guarantee they charged the same prices.⁹⁷ Although this lawsuit was referred to arbitration in 2017 for ultimate settling, in March 2016, Judge Jed Rakoff had refused Kalanick's attempt to dismiss the lawsuit and compared this case to the traditional 'hub and spoke conspiracies' where all the individuals were aware of the conditions negotiated in each vertical agreement.

IV. Conclusion

The sharing economy started out by conveying the appearance of equality between users and platforms and highlighted the sporadic and informal character of transactions.⁹⁸ Self-regulation and limited regulatory intervention were suggested in this context given the non-professional nature of these transactions.

The reality of the sharing economy has become much more complex in the meanwhile. Digital platforms currently do much more than matching supply and demand of underused goods: they apply algorithms to determine or suggest optimal prices, process reputational comments and ratings, provide more or less detailed advice to users to ensure high quality standards.⁹⁹ There are signs that the P2P-economy is slowly evolving into a quasi-professional system where service providers are expected to behave like professionals, even if they do not comply with the rules applicable to traditional services. Besides the often heard concern regarding unfair competition, the mechanisms employed for the purpose of this professionalization might raise other competition concerns.

This article discussed three central competition issues: the notion of 'undertaking' in the P2P-economy; the information exchanges occurring between platforms and suppliers; and the use of algorithmic pricing. In this context, I analysed the *Uber Spain* case which reminds us of the need to engage in a casuistic analysis of the degree to which service providers are independent from the platform, the amount of risks undertaken by the provider, the control exercised by the platform, and the legal relationship between the different actors (prosumers, platform and consumers). While in the case of Uber, suppliers were qualified as part of the platform and not as single economic units, the same might not apply to most other platforms. Despite the growing power of platforms, suppliers are still able to determine their own business strategy and should be regarded as undertakings.

The qualification of suppliers as undertakings independent from platforms means, nonetheless, that they might not be allowed to exchange sensitive information among themselves and use the same pricing tools. In this context, we concluded that the exchange of information can be particularly suspicious when it is used to stabilise prices. Service providers in the P2P-economy do not know each other and will rarely be able to collude to a great extent. It is thus mainly the relationship between suppliers and platforms that might raise competition concerns. While it might be difficult to prove hub-and-spoke collusions, competition authorities might need to be vigilant about vertical restraints in the online market. Despite their innovative potential, we also concluded that it is still uncertain whether concerted prac-

94 Also relevant in this case is the 2016 decision of the Competition and Market Authority involving the pricing of posters and frames sold on Amazon's UK website. See CMA, GB Posters/ Trod Ltd, Case 50223 (online sales of posters and frames).

95 Salil K Mehra, 'US v. Topkins: Can Price Fixing Be Based on Algorithms?' (2016) 7(7) *Journal of European Competition Law & Practice* 470.

96 For a detailed analysis of this phenomenon, see Ezrachi and Stucke, *Virtual Competition: The Promises and Perils of the Algorithm-Driven Economy* (n 88).

97 *Meyer v Kalanick*, US District Court, Southern District of New York, No 15-09796. In August 2017, the New York Court of Appeals reversed this decision and allowed the parties to settle the dispute out of court.

98 Advocating the benefits of the original model of the sharing economy, see Arun Sundararajan, *The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism* (MIT Press 2016); Robin Chase, *Peers Inc: How People and Platforms Are Inventing the Collaborative Economy and Reinventing Capitalism* (PublicAffairs 2015).

99 For a more detailed analysis of this point, see my previous work, Sofia Ranchordás, 'Home-Sharing in the Digital Economy: The Cases of Budapest, Brussels, and Stockholm', Impulse Paper prepared for the European Commission, DG GROW (2016).

tices in this context could be excused under Article 101(3) TFEU.

Future research on the anticompetitive effects of the P2P-economy should take into consideration the specific features of a sector, the growing collection of big data, the use of artificial intelligence in the context of collusion, and the need to update evidence rules considering the challenges of the algorithm-driven

ven economy. The next challenge for scholars and authorities might be investigate the growing power of digital platforms and whether these actors use their position to manipulate markets.¹⁰⁰

¹⁰⁰ See generally Julie E Cohen, 'The Regulatory State in the Information Age' (2016) 17 *Theoretical Inquiries in Law* 369, 375.