



Regulating Digital Platforms

vol. 21 | n°4 | 2019

« au service de l'analyse » — since 1998

networkindustries
quarterly

Network Industries Quarterly, Vol. 21, issue 4, 2019 (December) “Regulating Digital Platforms”

In this issue we pursue our exploration of whether and how digital platforms, especially digital platforms as applied to the network industries, should and could be regulated. Indeed, as of recently, attention paid to these emerging digital platforms is exploding. Most of the related publications aim at making recommendations as to whether, and if yes, how to regulate these digital platforms in the interest of the consumer, the citizen, the public economy and even public values. Some of these recommendations may be drawn quite hastily, triggered by scandals and other (geo-)political considerations.

The four contributing authors, all professors, will take a step back and look at where we stand in terms of the more academic debate on digital platforms, especially on these platforms that clearly have public (service) implications. In turn, they will apply economic, competition, legal and political perspectives on the regulation of digital platforms and try to derive from there the current state of the debate. In particular, they want to crystalize what we already know – and therefore have sufficient reasons to regulate – and what we do not know yet.

In short, this issue should serve as another contribution to the current debate about the regulation of digital platforms, in particular digital platforms applied to infrastructures and public services.

This special issue opens with an article by **Montero**, who analyses the regulation of a new model of industrial organisation, which should be built on the understanding of the role of platforms as intermediaries, on a massive scale, with the power to coordinate markets without owning the assets for the provision of services.

Köksal summarises the current EU and US approaches towards the digital platforms, and then underlines two challenging areas in which competition policy tools should be actively applied.

Finger analyses the algorithms platforms use to constantly increase their market power. By doing so, platforms, thanks to their algorithms, make choices on behalf of their customers – choices that are of a public policy nature. Finger discovers, should platforms and/or their underlying algorithms be regulated, and if so, how?

Chakravorty examines how economists view digital platforms as digital markets with an intermediary platform and then considers some studies that discuss the general challenges in regulating digital platforms.

Matthias Finger

dossier

- 3 Digital Platforms vs. Large-Scale Firms: Regulating a New Model of Industrial Organisation
Juan José Montero
- 7 Competition Policy Towards Digital Platforms
Emin Köksal
- 10 Algorithms as Public Policy: How to Regulate Them?
Matthias Finger
- 15 Regulation of Digital Platforms: A Survey of the Economic Literature
Shourjo Chakravorty
- 22 Announcements

Network Industries Quarterly | Published four times a year, contains information about postal, telecommunications, energy, water, transportation and network industries in general. It provides original analysis, information and opinions on current issues. The editor establishes caps, headings, sub-headings, introductory abstract and inserts in articles. He also edits the articles. Opinions are the sole responsibility of the author(s).

Subscription | The subscription is free. Please do register at fsr.transport@eui.eu to be alerted upon publication.

Letters | We do publish letters from readers. Please include a full postal address and a reference to the article under discussion. The letter will be published along with the name of the author and country of residence. Send your letter (maximum 450 words) to the editor-in-chief. Letters may be edited.

Publication director | Matthias Finger

Managing editor | Irina Lapenkova

Publishing editor | Ozan Barış Süt

Founding editor | Matthias Finger

Cover image | Photo by Markus Spiske on Unsplash

Publisher | Chair MIR, Matthias Finger, director, EPFL-CDM, Building Odyssea, Station 5, CH-1015 Lausanne, Switzerland (phone: +41.21.693.00.02; fax: +41.21.693.00.80; email: mir@epfl.ch; website: <http://mir.epfl.ch/>)

Digital Platforms vs. Large-Scale Firms: Regulating a New Model of Industrial Organisation

Juan José Montero*

As technology reduces transaction costs, digital platforms are creating a new industrial organisation model to coordinate economic actors. This new model is in competition with the hierarchical coordination inside large-scale firms. The regulation adopted over the last century for large-scale integrated firms cannot be automatically extended to platforms. Regulation should be built on the understanding of the role of platforms as intermediaries, on a massive scale, with the power to coordinate markets without owning the assets for the provision of services.

The large-scale firm

The Industrial Revolution substituted the traditional agrarian society of small producers and local markets by large-scale firms and first national and later global markets. New technology empowered this transformation. Industrial production, with new energy forms, created economies of scale in production, ensuring industrial production a competitive advantage. Railways, steamships, the telegraph and the telephone enlarged markets from local to national, aggregating demand for large-scale production.

The firm was at the center of this transformation. Economists identified the role of the firm as a system coordinator. In 1937's "The Nature of the Firm", one of the most quoted economic papers in history, Ronald Coase explained that the "entrepreneur-co-ordinator, who directs production" substitutes within the firm the price movements that direct production outside the firm (p. 388). The reason for this substitution is the high transaction costs in the market, which are mostly linked to poor information and uncertainty. The higher the transaction costs in the market, the larger the production that would be integrated/coordinated within the firm, and the larger the firm would turn. Transaction costs were identified as the reason for firms to exist.

Large-scale firms coordinate the necessary assets: capital, technology, human resources, distribution networks, etc. Coordination is executed by integrating the assets vertically into a single entity under the hierarchical control of the entrepreneur/manager. Again, technology makes this coordination possible (communications, transport, media, etc.).

The technology that empowers large-scale firms actually was coordinated *by* large-scale firms, which often adopted the form of a monopoly: AT&T for telephony, GE for electricity, railways, etc. The network industries in the

United States were a good example of the coordinating role of the entrepreneur substituting market coordination.

Regulation was adopted to foster industrialisation. The same corporations were made possible by the authorisation to create legal persons and the adoption of sophisticated legislation to govern them. Capital accumulation was facilitated by new legislation on banking and stock exchanges, etc.

Regulation was later adopted to govern the negative effects of industrial firms; this included antitrust rules to protect competition, economic regulation to control monopolistic network industries, labor laws to govern the relationships between firms and workers, and consumer protection legislation.

This model has been taken to the extreme over the last decades. Globalisation has created the largest of the markets, rewarding firms that exhaust economies of scale. The pursuit of scale has produced behemoths that dominate industry after industry: larger industrial production plants (often in China), larger shipping companies operating the largest container-ships ever, larger financial institutions, larger media groups, and so on.

Technology and transaction costs

However, this trend might be turning. For decades, large-scale firm have been increasingly outsourcing production. Demand for ever-larger aircrafts and vessels is slowing. Large transnational acquisitions for the creation of global communications, electricity, or transport groups are increasingly exceptional. Certainly, there might be alternative explanations for many of these evolutions, but technology that reduces transactions costs and reduces the competitiveness of large-scale firms might be behind this new trend.

Information and communication technology (ICT) has dramatically reduced transaction costs over the last 20

* Juan J. Montero, Part-time Professor, Florence School of Regulation & UNED University (Madrid), jlmontero@der.uned.es

years. Some of the more relevant transaction costs are related to search and management of information related to the counterparty, the product, the transaction itself or the execution of the transaction. Communication costs are also relevant. The development of the internet has made information available at a previously unknown scale. The new communications technology (mobile networks, data communications services, voice over the internet, etc.) has made the information ubiquitous at a very low cost. Finally, computing has reduced the cost of managing the massive amount of available information. The next step is the automation of more and more transactions. The full deployment of ICT and the increasing application of artificial intelligence are substituting human intervention in many commercial (and non-commercial) transactions. Automation will have a strong effect on transaction costs.

In Coase's terms, technology has the power to reduce the cost of coordination in the market, making it more efficient than internal coordination inside the firm. Coordination of the transactions in the market is precisely the ambition of the digital platforms. Platforms have the ability to fully exploit technology to reduce transaction costs, which is why they are in competition with the large-scale firms, the institution exploiting internal coordination.

Digital platforms

Digital platforms coordinating multi-sided markets are the new model of industrial organisation empowered by technology. Multi-sided markets typically involve two or more distinct types of users, interacting through a third party, the platform. This model was identified by Rochet and Tirole in their seminal paper "Platform Competition in Two-Sided Markets". The new paradigm built by Rochet and Tirole has spawned a substantial amount of industrial organisation literature (Evans et al., 2016; Parker et al. 2016).

Multi-sided markets typically involve two or more distinct types of users that interact through a third party, the platform. Positive network effects (both direct and indirect) are key. The larger the ecosystem, the larger the network effects. Platforms are central to this new model of industrial organisation. Firstly, they are the entities that use the technology to reduce transaction costs. Apps make use of the internet to reduce communication costs to almost zero, use algorithms to match supply and demand, and provide information about the counterparties (ranking, likes, etc.). Secondly, they invest in growing the ecosystem around them to reach the positive network effects. Thirdly, they coordinate the market place, setting the standards,

the rules and the distribution across the ecosystem of the benefits created by the network effects.

Scale can now be built by coordinating the assets provided by third parties, many of which are small providers. Large-scale firms have now an alternative. Digital platforms can rapidly pull together more assets than individual firms; for example, Airbnb provides access to more rooms than any hotel chain.

In Coase's terms, technology has reduced transaction costs, which has meant that coordination in the market can become more efficient than coordination by the entrepreneur inside the firm. Furthermore, technology has empowered a new form of coordination in the market. The market is not only the traditional direct relationship between supply and demand. Transaction costs are reduced as a new intermediary – the digital platform – coordinates supply and demand in the most efficient manner. The platform becomes the market coordinator.

Competition between two models of industrial organisation

As platforms emerge across industries, two models of industrial organisation compete with each other: platforms and large-scale firms. Accommodation has already been given as an example, but the trend can be identified at a much broader scale.

Media has shown how platforms coordinating third parties (Facebook and YouTube are the prime examples) can compete with well-established traditional media empires and outnumber them, both in viewership scale and advertisement revenue. Traditional newspapers and broadcasters are increasingly being intermediated by platforms. Viewers tend to have their access to individual news-pieces filtered and proposed to them by the platforms. Digital platforms are becoming the coordinators of the media market. Traditional media companies are increasingly working for the platforms' algorithms.

Transport also shows the capacity of platforms to create networks on top of distributed systems such as private cars. For example, Uber coordinates a fleet of around 3 million vehicles/drivers, and it is starting to pull together different transport modes (cars, scooters, and mass-transit) and expanding from passenger transportation into food delivery and freight transportation. Digital platforms aim to coordinate trucks, vessels and aircrafts, in competition with the well-established behemoths in the maritime and aviation industries. Again, traditional transport providers are increasingly working for the algorithms that coordinate the competing transport modes/services.

As Google CEO Eric Schmidt said, “One very compelling – and underappreciated – aspect of the internet is how it has greatly expanded the potential to build platforms not just in the technology business, but in *any* industry” (Schmidt 2014, p. 81). Any industry can be disrupted by platforms coordinating third-party assets at a previously unknown scale, with unknown efficiency.

Are large accommodation, media, transport, or finance firms even necessary in a new world of digital platforms coordinating small firm’s (and even individually owned) rooms, news-pieces, rides, and finance transactions?

Regulating digital platforms

Just as a new legal framework was built for large-scale firms and the industrial world, a new legal framework is necessary for the new model of industrial organisation emerging around digital platforms. The legal rules designed for the large-scale firm cannot be automatically applied to the platforms, just as the old feudal rules were an obstacle to industrialisation and did not solve the challenges it posed to workers, consumers, and the environment.

Traditional legislation on labor, liability, antitrust, consumer protection, etc. was designed for large-scale firms that were in full control of their assets, as they were internalised and under the hierarchical control of the entrepreneur/manager.

Digital platforms do not have such control over the assets they coordinate. They do not own the assets they coordinate (rooms, vehicles, etc.). They do not employ the individuals providing assets and services (drivers, home owners, etc.) under labor law.

Digital platforms are intermediaries. They use technology to facilitate the interaction between third parties. It can be the interaction among businesses (B2B), between business and consumers (B2C), or even between businesses and government (B2G). Intermediation is prone to conflicts of interest. This is why intermediaries often have codes of conduct and are sometimes subject to regulation. Transparency is often a requirement to avoid conflict of interests. Non-discrimination rules are common among intermediaries. These are the principles that should inspire platform regulation.

However, the scale and market power of the new intermediaries have no precedent. The largest platforms coordinate literally billions of users across the world. It is not only a scale. Platforms are growing increasingly powerful in the markets they intermediate. Network effects lead to market concentration. Platforms tend to evolve into tight oligopolies and even monopolies (winner-take-all). Such concentration reinforces the role of the platform as system coor-

dinator. They do not merely create network effects across their ecosystem, but they decide how the ecosystem works, who is accepted into it, and how the benefits derived from network effects are distributed across the ecosystem.

Digital platforms challenge the existing regulation. Liability for the provision of services intermediated by the platform is a challenge. Full liability for the intermediated service is not usually required of intermediaries. However, in an automatically intermediated transaction, consumers might not even recognize that an intermediary has intervened. They often think it is the platform that is providing the service. In fact, the stronger the coordination role of the platforms, the more confusing it is for the consumer. At the same time, imposing full liability on the platform would ignore the fact that platforms do not own the assets and that service providers are not under the hierarchical control of the platform. Furthermore, full liability could be a fundamental obstacle for the platform to grow the massive ecosystem around them and reach the efficiencies, damaging consumers and society as a whole.

For example, antitrust faces fundamental difficulties to define the relevant market. Platforms work across markets. The more traditional markets they coordinate, the larger the network effects and the larger the benefits. It is difficult to model such complex structures to identify the harm in a merger or in an abuse of dominant position case, or to identify potentially anticompetitive vertical agreements between the platform and the intermediated firms.

Labor law is another example of a regulation adopted for the large-scale firm that cannot be automatically extended to digital platforms. Small service providers are not under the hierarchical control of the platform as they are under the control of the traditional firm. Service providers are usually free to work with several platforms at the same time (multi-homing); they decide when they want to work, and they are free to take many decision on how they provide their services. They usually have the direct contractual relationship with the consumer. Again, automatically extending the labor regulation to platforms could just delay or hinder the construction of the network effects that create the efficiencies for the benefit of the consumers and society as a whole.

Does this mean that digital platforms should not be regulated? Not at all! Digital platforms can harm producers, particularly individual workers, consumers, and society in many new forms. But regulation must be adapted to the new reality. Regulation should start with the acknowledgement that platforms create massive efficiencies that cannot be ignored or shunned if a society wants to remain competitive. Regulation must then be adapted to the new real-

ity and to the structure of the new industrial organisation model.

First, the regulation of the digital platforms should be built on the recognition that platforms intermediate between third parties. Platforms are built on billions of contractual relationships with producers, consumers, advertisers, etc. Regulation should focus on these contractual relationships, and particularly on the algorithms that enforce such contracts. Algorithms should be more transparent, so the intermediate parties are aware of potential conflicts of interests. It is important to understand why and how service providers are selected by the algorithm against a competitor. This is particularly the case when the platform is vertically integrated and not only intermediates, but also competes in the provision of the service.

Second, the vertical contractual relationships between service providers and platforms are key. As the economy is “platformised” (transformed into multi-sided markets coordinated by a platform), individual service providers get “platformed”, their services commodified and their position against the platform weakened. The financial sustainability of underlying service providers must be protected, both in the case of individuals but also in case of infrastructure managers (Montero & Finger, 2017).

Third, the market power of the most successful platforms relies on network effects. The regulation of such market position should be inspired by the experience of the regulation of the traditional network industries over the last century: unbundling, portability, measures to reduce barriers to entry, access regulation are the precedents upon which the regulation of platforms as the new network industries can be built (Finger & Montero, 2018).

Fourth, on a broader scale, it is through the algorithms that platforms coordinate the markets around them. Algorithms can have a negative impact on the intermediated parties, both producers and consumers. Algorithms can also have effects on the general interest, on the wider dynamics resulting from millions of interactions in the market. The tools for regulators to ensure that the algorithms promote the general interest have to be designed.

References

- Coase, R. (1937), “The nature of the firm” *Economica*, 4(16): 386–405.
- Evans, D. S. & Schmalensee, R. (2016), *Matchmakers. The New Economics of Multi-sided Platforms*, Harvard Business Review Press, Boston.
- Finger, M, & Montero, J. (2018), *A programme for the new network industries*, Robert Schuman Centre for Advanced Studies Research Paper No. RSCAS, 41.
- Montero, J. J., & Finger, M. (2017), “Platformed! Network industries and the new digital paradigm”, *Competition and Regulation in Network Industries*, 18(3–4), 217–239.
- Parker, Van Alstyne & Choudary (2016), *Platform Revolution*, WW Norton & Company, New York.
- Rochet, J.C. & Tirole, J. (2003), “Platform Competition in Two-Sided Markets,” *Journal of the European Economic Association*, 1(4): 990–1029.
- Schmidt, E. & Rosenberg, J. (2014), *How Google works*, John Murray (Publishers), London.

Competition Policy Towards Digital Platforms

Emin Köksal*

Among the diverse public policy tools, competition policy is commonly considered as an effective instrument with which to deal with increasing dominance of digital platforms. Although current competition policies towards the digital platforms on both side of the Atlantic have been evolving, we have not yet seen an effective approach. It will only be possible to simultaneously maintain innovation incentives and curb market power in platform markets by adopting a new understanding in competition policy.

Introduction

While digital platforms have increased their influence on our daily lives, we have encountered new innovative services, but also faced unprecedented social and economic issues. Competition policy is commonly considered as an effective public policy tool to deal with these issues. Competition policy tools have been actively used in the European Union (EU) to deter anticompetitive behavior of the platforms. In the United States, meanwhile, the political salience of competition policy towards the digital platforms has increased progressively. In this paper, I will first summarise the current EU and US approaches towards the digital platforms, and then underline two challenging areas in which competition policy tools should be actively applied.

Current policies towards digital platforms

The scale of digital platforms and their global expansion has led to calls for more interventionist public policies. There are two main reasons for the rise of such a tendency. First, the share of the platforms in added value has increased at the expense of the entities that use these platforms to reach final consumers (Hortaçsu and Syverson 2015). As their share in the value-added process to decline, those entities call for public intervention to reverse it. Second, personal data retrieved by the platforms and its usage may potentially harm the competition in the market (Graef 2015). In parallel with their increasing share in added value, the platforms use the data to consolidate their market power. In many countries, these two concerns have led to debates about the need for a more rigid competition policy.

The most radical proposal has come from the US, where most of these platforms have originated, expressed most publicly by Elizabeth Warren, a potential Democratic presidential candidate. She has called for regulators to break up digital platforms such as Facebook, Amazon, and Google.

She has argued that reducing the scale of these platforms would give existing and potential competitors more opportunities to compete, which is more desirable in terms of a viable competition in the market. Moreover, Warren has suggested legislation that would prohibit the platforms from both offering a marketplace for commerce and participating in that marketplace (see Herndon 2019).

Although such a plan may seem fair at first sight, any intervention under a competition policy should be based on legal and economic foundations. In particular, such a structural intervention should be supported by economic facts, as well as legal justifications. On academic grounds, scholars like Lina Khan represent an academic base for those kinds of regulatory plans. In her influential article, Khan (2016) argued that the current antitrust framework is unequipped to capture the architecture of market power in the digital economy. Khan proposed two potential ways to address the power of digital platforms: (1) restoring traditional competition policy principles, or (2) applying ex-ante obligations for those platforms.

A look at recent practices in the US shows that the country's two antitrust enforcement agencies have already re-organised their workforces to deal with digital platforms. The Federal Trade Commission (FTC) and the Antitrust Division of the Department of Justice (DoJ) agreed on a plan to divide regulation of four of the country's largest platforms. Under this plan, the FTC supervises Facebook and Amazon, while the DoJ handles Google and Apple (Kendall and McKinnon 2019). However, the approaches of the enforcement agencies are more modest than those of the politicians. As understood from their public explanations, they aim to maintain innovation incentives while curbing market power of the platforms (see McConnell 2019). Although neither the FTC nor the DoJ has opened any cases yet, the attorneys-general who represent the 50 states have recently started a competition probe into Google's activities in advertising and search businesses.

* Emin Köksal, associate professor, Department of Economics, Bahçeşehir University, Istanbul, Turkey, emin.koksal@eas.bau.edu.tr

On the other hand, in the EU, practice of competition policy has been beyond any political debate thanks to the European Commission's (EC) decisions in recent years (see Dionnet and Zacharodimos 2019). During the past few years, the EC has concluded investigations against Google, with record fines. In 2017 it fined the company 2.42 billion EUR for abusing its dominant position by favoring its shopping application compared to competing shopping services. In 2018, the EC fined Google 4.34 billion EUR after it found that the platform had engaged in anticompetitive practices to reinforce its dominant position in general internet searches via licensing its mobile operating system Android. Finally, in 2019, the EC fined the company 1.49 billion EUR for abusing its dominant position by imposing a number of restrictive clauses in contracts with third-party websites that prevented Google's rivals from placing their search advertisements on these websites.

Amazon is another digital platform that has been scrutinised by the EC. Although certain probes against Amazon have been terminated by the company's commitments concerning its problematic business practices, the EC is currently investigating Amazon's conduct in terms of its dual role as a platform for retailers and as a retailer itself. Apple is also targeted by the EC for similar conduct. The EC started to examine Apple's practices concerning its App Store following a complaint by music platform Spotify. The complaint claims that Apple is undermining Spotify's competitive position, among others, through its pricing policy.

Although there has not yet been any investigation into Facebook at the EC level, the German enforcer Federal Cartel Office (FCO) investigated Facebook and fined the company for its data collection and processing policy of its users. The enforcer decided that Facebook's data policy constitutes an abuse of dominant position on the social network market in the form of exploitative harm for consumers.

Towards a new understanding in competition policy

Considering the aforementioned issues, one could argue that competition policies on both sides of the Atlantic have been evolving to deal with the increasing dominance of the digital platforms. Although the direction of the evolution is still ambiguous, it is certain that the traditional reasoning set out in competition policy is no longer valid to analyse the dynamic nature of platform industries. As Nobel Laureate Jean Tirole⁽²⁰¹⁷⁾ has noted, the competition policy towards the platforms should review its software. Through adopting a new understanding and implementing better tools, innovation should be incentivised while curbing the market power of the platforms. Although there

are various issues concerning this software update, I will elaborate on two of them: concentration and data.

There are two main sources of the concentration in platform markets: network effects (both direct and indirect) and economies of scale (Tirole 2017). As the number of users of a platform increases, network effects initiate and create a feedback loop that makes this platform more attractive. Thereby, more users gradually tend to use the platform. In addition, platform businesses usually require large technological investment and only become feasible with a high number of users. Those two factors inherently create entry barriers and give rise to concentrated markets in which a single platform usually operates as a dominant player. Considering this fact, limiting the size of a platform or rigorously breaking up a platform seems infeasible in economic terms.

However, there are still two significant roles that the competition policy should play. First, entry barriers should be decreased to allow the flourish of new ideas as disruptive rivals (Bethell et al. 2019). For instance, decreasing the switching cost of users should play a significant role in that sense of encouraging potential rival platforms. If users can be on different platforms at the same time, or they can easily migrate to other platforms, then potential rivals find it easy to enter the market. Such an approach would not only allow new entrants but also keep the existing players more innovative (Federico et al. 2019). Through closely monitoring the existing platforms and market conditions, competition enforcers may explore more factors to eliminate that work as entry barriers. In order to decrease the monitoring costs, regulators may adopt more responsive complaint mechanisms.

Second, an active merger control policy should be adopted in order to curb the concentration in platform markets. Currently, a merger or an acquisition must be notified to the relevant competition authority if the target or purchaser company's turnover exceeds certain thresholds in money terms. Moreover, the examination becomes critical only if the two companies are in the same relevant market. However, in recent years most of the digital platforms have quickly expanded their businesses into diverse areas. For instance, Facebook acquired WhatsApp, a well-known messaging application, and Google acquired Nest, a smart home product producer. Most recently, Google planned to acquire Fitbit, a wearable technology producer. By acquiring a company in a different market, the platform directly becomes a significant player in that market. Moreover, the data acquired via the acquisition reinforces the purchasing platform's dominance in its core business. Therefore, an active merger policy equipped with new tools should be

adopted for an effective competition policy towards the platforms.

Thanks to internet-related digital technologies, it has become feasible to collect and process mass personal data for the first time in history. At every stage of our daily lives we produce personal data about our health condition, shopping behavior, etc. Digital platforms use this data to offer us more targeted, innovative products. In theory there is nothing wrong with this. However, from the competition policy perspective, data collected by a dominant platform may be part of exclusionary conduct to eliminate the threat of disruptive firms.

Having mass personal data enables platforms to offer innovative services and helps them gain competitive advantages. Based on this motivation, the platforms invest in data collection and processing technologies to innovate new services. Therefore, a rigid approach for data collection and processing may harm this innovative process. In this respect, competition policy should maintain those incentives and should not directly punish the platforms for their treatment of data. However, data owned by the incumbent platform may constitute an entry barrier for a potential rival (Tucker 2019). If a platform has a business strategy to exclude potential rivalry using data as an instrument, then an intervention should be required unless this practice does not have any economic justification.

Conclusion

The above analysis clearly shows that competition policy needs an evolution to deal with the increasing dominance of the digital platforms. However, radical remedies like breaking up the platforms are not compatible with the nature of platform markets. Nonetheless, constantly fining the platforms for their wrong doings is not an effective way to ensure competition, unless it is applied as a part of a new approach. Maintaining innovation incentives and curbing market power at the same time in platform markets can only be achieved through adopting a new understanding in competition policy.

References

- Bethell, O. J., Baird, G. N., and Waksman, A. M. (2019), 'Ensuring innovation through participative antitrust', *Journal of Antitrust Enforcement*, Article in Press: 1–26.
- Dionnet, S., and Zacharodimos, G. (2019, August), 'Digital markets: recent competition law developments in the EU', <<https://www.financierworldwide.com/digital-markets-recent-competition-law-developments-in-the-eu#.XcquYS2B0Wo>>, accessed 10 November 2019.
- Federico, G., Morton, F. S., and Shapiro, C. (2019), 'Antitrust and Innovation: Welcoming and Protecting Disruption', *NBER Working Paper*, 26005.
- Graef, I. (2015), 'Market Definition and Market Power in Data: The Case of Online Platforms', *World Competition*, 38 (4): 473–505.
- Herndon, A. W. (2019, March 8), 'Elizabeth Warren Proposes Breaking Up Tech Giants Like Amazon and Facebook', *The New York Times*, <<https://www.nytimes.com/2019/03/08/us/politics/elizabeth-warren-amazon.html?module=inline>>, accessed 10 November 2019.
- Hortaçsu, A., and Syverson, C. (2015), 'The Ongoing Evolution of US Retail: A Format Tug-of-War', *Journal of Economic Perspectives*, 29 (4): 89–112.
- Kendall, B., and McKinnon, J. D. (2019, June 3), 'Congress, Enforcement Agencies Target Tech', *The Wall Street Journal*, <https://www.wsj.com/articles/ftc-to-examine-how-facebook-s-practices-affect-digital-competition-11559576731?mod=article_inline>, accessed 10 November 2019.
- Khan, L. M. (2016) 'Amazon's Antitrust Paradox Amazon's Antitrust Paradox', *Yale Law Journal*, 126 (3): 710–805.
- McConnell, C. (2019, March 6), 'US DOJ view of digital platforms guided by Trinko', *Global Competition Review*. <<https://globalcompetitionreview.com/article/1189234/us-doj-view-of-digital-platforms-guided-by-trinko>>, accessed 10 November 2019.
- Tirole, J. (2017), *Economics for the Common Good*. (Princeton University Press).
- Tucker, C. (2019), 'Digital Data, Platforms and the Usual [Antitrust] Suspects: Network Effects, Switching Costs, Essential Facility', *Review of Industrial Organization*, 54 (4): 683–694.

Algorithms as Public Policy: How to Regulate Them?

Matthias Finger*

Platforms are challenging public service providers in the different network industries, as they position themselves between these providers and their customers/users, and also tend towards monopolies. Consequently, such platforms become something like the “new infrastructures”. As new infrastructures, they are able to appropriate much, if not all, of the profits, which were traditionally reinvested both in the infrastructures and infrastructure (public) services providers. Furthermore, platforms use increasingly sophisticated algorithms to constantly increase their market power (for example, winner-takes-all). By doing so, platforms, thanks to their algorithms, make choices on behalf of their customers – choices that are of a public policy nature. Should they and/or their underlying algorithms be regulated, and if so, how? This is the topic of this short essay.

Introduction

Digital platforms will play a growing role in the different network industries (infrastructures) in the not too distant future (Finger, 2019; Finger & Montero, 2017), beginning with mobility (Finger and Auduoin, 2018). This raises questions about the regulation of these digital platforms, as well as regarding whether additional regulation is necessary if applied in the different infrastructures, particularly also because infrastructures are strongly driven by public policy objectives. This latter issue is the subject of this essay. However, before addressing this issue, I will first recall the general nature of digital platforms and, in particular, the role played by algorithms as the key driver of their raising power. I will then discuss the specific public policy dimensions of infrastructures and, finally, explore why this specific public policy nature of digital platforms calls for regulation.

Digital platforms and the power of algorithms

Digital platforms mediate between parties involved in a transaction, such as suppliers and buyers, along with third parties such as advertisers. In doing so, platforms take advantage of “digitalization”, the defining feature of which is its ability to significantly reduce transaction costs. The ensuing direct and indirect network effects are known to lead to monopolization, a phenomenon that is also called “winner-takes-it-all” (Evans and Schmalensee, 2016; Parker, van Alstyne and Choudary, 2016). But how exactly does digitalization engender such network effects or, in other words, lead to the “power of platforms”, both in general and in the case of the infrastructures?

Is data key?

There has been a lot of discussion about data being key. It has been argued that digital platforms owe their power to all the data they are sitting on (Mayer-Schönenberger and Cukier, 2013). Consequently, they should be forced (via regulation) to share them or make them “open” so that their monopolies can be broken, so that competitors can

also enjoy the benefits of competition, and so that customers can take advantage of the benefits of innovation.

While data are certainly important, they are only one side of the coin. It is true that more data about the buyers will allow the platform to suggest to these same buyers more targeted products and services, as it will allow the platform to suggest to the advisers more efficient (that is, more personalized) ads. More data about the suppliers will help the platform better know its strengths and weaknesses (quality, delivery times, handling of complaints, etc.) and thus better use its strengths and weaknesses to the benefit of the buyers, advertisers, and of course the platforms themselves. Needless to say, the profits platforms make are, in essence, efficiency gains; in other words, there is no real value added. Platforms coordinate more efficiently than physical actors, and the so efficiency gains reflect a platform’s profits, at least initially. Once platforms become dominant or even monopolistic, they will also be able to take advantage of their monopoly position vis-à-vis the suppliers, the buyers and the third parties, and extract monopoly rents.

The following figure represents the economics of platforms; that is a multi-sided market with strong network effects. The more buyers there are, the better it is for the suppliers; the more suppliers there are, the better it is for the buyers; the more suppliers and buyers there are on the platform, the better it is for the advertisers (third party); and the more advertisers there are, the better it is for the buyers and the suppliers, as products and services can be even subsidized by the platform. Figure 1 illustrates these network effects.

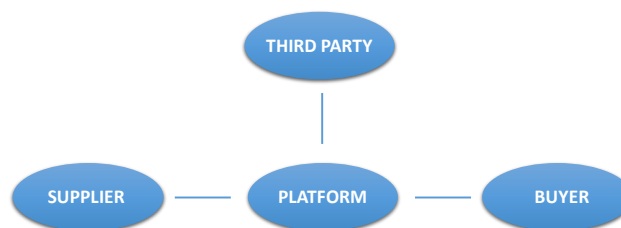


Figure 1. Platform Economics
Source: Author’s own compilation

* Matthias Finger, Professor, EPFL, EUI, ITÜ, matthias.finger@epfl.ch

From data to algorithms

Of course, platform economics is about numbers: more suppliers, more buyers, more advertisers. It is also about datapoints: more data about suppliers, more data about buyers, more data about third parties. But data without analysis are simply junk, and that is where algorithms come in. Algorithms offer the possibility of an ever more sophisticated (that is, an increasingly anticipatory, predictive, and suggestive) analysis of buyer, supplier, and third party behavior, ideally even in relationship to one another. This, in turn, increases the relative power of one platform vis-à-vis another (leading ultimately to a monopoly), as well as their extractive power over buyers, suppliers, and third parties (Domingos, 2015; Agrawal, Gans and Goldfarb, 2018).

Up to a certain point, algorithms can even substitute data. Of course, data are needed to train algorithms, but, once trained, algorithms can work even with basic and proxy data. In other words, not all the data need to be retrieved from all the suppliers, buyers, and third parties all the time. A critical sample is often sufficient to predict the behavior of the different parties. In this sense, algorithms are key for increasing the power of platforms (vis-à-vis other platforms) and for extracting even higher monopoly rents from all the different parties to the platform.

The non-neutrality of algorithms

Algorithms are the result of the work of programmers who are tasked with optimizing along some objective function. Platforms (so far) are commercial undertakings; consequently, programmers – and therefore platforms – are optimizing the tension between extraction of revenue and supplier, buyer and advertiser satisfaction. Amazon will suggest a book to a potential buyer, of whom the (programmer of the) algorithm thinks that it is most likely to be bought. Among all the books most likely to be bought, the algorithm will probably favor those from suppliers with whom Amazon has a better deal. To use another example, an online dating platform will of course suggest likeable potential partners, but not necessarily partners with whom the partner will hopelessly fall in love, never to be seen on the platform again.

Of course, any other objective function – such as cheaper books, less wasteful products, more intelligent partners, more considerate opinion pieces (in the case of a newsfeed) – could also be programmed into an algorithm instead. My point here is not to say that this should be done, simply that it could be done, as this is not a technical problem. It is simply a matter of objectives and of incentives.

Currently, traditional platforms such as Amazon, Facebook, Airbnb, booking.com, and Kayak do not typically make policy, although they do influence policy, as the point is now openly debated in the case of social media platforms. However, these platforms do have the ability to influence public opinion and thus policy. No matter what they do, they do influence behavior and thus play a policy-making role. This may not seem important in the case of the choice of an airline, for example, but even here one could argue that instead of optimizing for price and travel times, the platform could also optimize for less polluting aircraft or for airlines with a more progressive standing in matters of sustainability. In this way, platforms, thanks to their algorithms, could actually play a more active role in public policy. And, if they explicitly do this, should they be regulated? If they do not, should they be used for public policy-making and therefore be actively regulated as well? If yes, how?

Infrastructures as public policy

While the above questions as applied to traditional (and commercial) platforms seem to be rather academic, the issue is much more real in the case of infrastructures, and this is where I want to turn to now. Let me do this in two steps by using two examples – Uber and MaaS (mobility-as-a-service) – before generalizing the argument to platforms in infrastructures more generally. The reasons why I selected and MaaS are mainly pedagogical, as both examples perfectly illustrate the argument I am trying to make.

Uber

Uber, or any other ride-hailing provider for that matter (Lyft, blablacar, etc.), is a platform that mediates between a driver and a customer/user. For the customers, it is primarily a substitute for a taxi service, but it turns out that Uber also substitutes for some public transport offerings, at least in some cities and countries. Uber cars use public infrastructures, such as roads and highways. Figure 2 illustrates the “Uber phenomenon”:

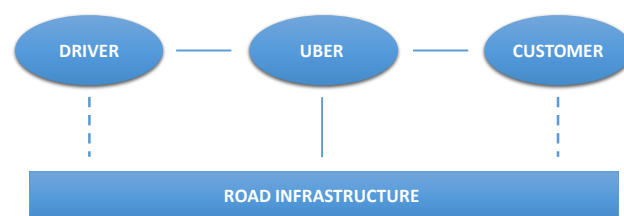


Figure 2. The “UBER phenomenon”

Source: Author's own compilation

Roads and highways are public infrastructures; that is, they are paid for mostly by taxpayers. Two public policy issues of digital platforms as applied to infrastructures can be highlighted here, the first is financial and the second is political:

1. The financial issue: Road and highway infrastructures' investments and maintenance are mainly paid for by the taxpayers. Private cars contribute to a certain extent through all kind of taxes (vehicle tax, fuel tax, etc.), while taxis also contribute by way of license fees. While private car owners typically pay at the national level, taxis mainly pay to the city authorities. A typical private car is used approximately one out of every 24 hours by approximately one or two passengers. The business case of UBER is to better use the asset (that is, the car) significantly more than a private driver would (even though it still qualifies as a private car). While fuel tax is proportionate to usage, vehicle tax typically is not. In other words, Uber gets a good deal. It gets an even better deal considering that it does not, as is the case in most cities, pay a license fee. In short, Uber cars use infrastructures disproportionately more while paying less. Consequently, the difference is paid by the taxpayer, who, so-to-speak, subsidizes Uber. This is clearly a public policy issue.

2. The political issue: It is well known that Uber, at least in some cities, induces more traffic. People who would not otherwise travel make a quick Uber trip and add to CO₂ emissions, congestion, pollution, and noise. These are all externalities for which Uber and its customers do not pay, although this is also the case with private car users. CO₂ emissions, pollution, noise, and congestion have recently become political issues and public authorities, especially in cities, are actively trying to reduce car usage. Should this also apply to Uber usage, especially if Uber can take advantage of less crowded roads. Such is the political (public policy) question that Uber as a platform, and for that matter all other platforms that use public infrastructures, raises.

Both of the above issues are problematic, but can be solved by way of regulation, provided that there is political will. From a technical regulatory point of view, however, such regulation is not too difficult to implement. To solve both the financial and the political issues, Uber licenses could incorporate the disproportionate use of the public road infrastructure, as they could incorporate the externalities that Uber cars cause. The remaining question, then, is whether Uber still has a business model once all externalities are fully internalized, but this is a different question.

MaaS

I will now go one step further by discussing MaaS platforms, which illustrate a third issue, namely a policy issue, in which algorithms play a crucial role.

MaaS platforms are a step beyond ride-sharing platforms. They not only aggregate ride-hailing providers, but they also include public transport offerings from trains, metros, trams, buses, as well as car rentals, bike-sharing offerings, even parking and potentially many other things. As with Uber, customers use an app when booking a ride, except that in the case of MaaS platforms such rides can include any combination of transport modes so as to get from A to B in the quickest, most efficient, cheapest or most ecological way. MaaS platforms are private undertakings and will therefore optimize revenue for themselves, while trying to satisfy customers. Figure 3 illustrates how MaaS platforms work.

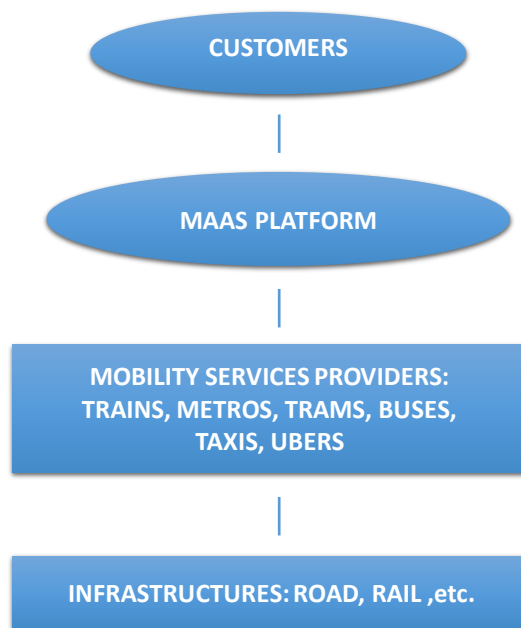


Figure 3. The workings of MaaS platforms
Source: Author's own compilation

MaaS platforms of course display the same issue as Uber platforms when it comes to finances, but this time the issue is further exacerbated. Not only are physical infrastructures used by the private platforms who do not pay for investments and maintenance of these infrastructures, but the service providers (such as train operating companies, bus operators, etc.) are also being “commoditized” by the platform. This can become a problem because many of these service providers are also subsidized by the pub-

lic authorities to various extents. Also, as platforms take a margin in-between the service providers and the customer, this amounts to the taxpayer subsidizing private platforms.

However, MaaS platforms illustrate yet another issue: the difficulty, if not the impossibility, of making public policy. Infrastructures, especially infrastructure services provision, ultimately serve public policy, and not just simply market objectives. Infrastructures – or what is now called “foundational infrastructures” – create the very conditions for societies to develop and must be treated as such. This is the case of energy, transport, communications and water infrastructures, in which the public authorities invest – and which public authorities sometimes operate – so that citizens have access to basic (and sophisticated) transport, energy, water, and communications services, and thanks to which business can develop their commercial activities. If such infrastructures do not perform, are not well maintained, or are just not sufficiently developed, this will be detrimental to social welfare. When private digital platforms start to overlay such public service infrastructures, this raises a public policy issue.

3. The public policy issue: Such a public policy issue arises because digital platforms – and especially their underlying algorithms – interfere in, influence, and probably even “make” public policy. In the case of MaaS, the platform will suggest the cheapest, fastest, most reliable, most ecological, etc., route to get from A to B, while at the same time seeking to optimize its own revenue. For example, a train ride may be more ecological than a bus ride, but it may take a few minutes more; similarly, an Uber ride may be faster than a metro ride, but the MaaS platform may get a better deal with the metro service provider. In any case, MaaS platforms – like any other digital platform for that matter – will influence, if not determine consumer choices. These choices will be programmed into the algorithms that suggest or even select the mobility options for the users. What is programmed into these algorithms will remain non-transparent, as these algorithms constitute the very competitive advantage of the MaaS platform, not to mention that they are at the heart of the MaaS platform’s business model. I will discuss the difficulties to regulate algorithms and such platforms in the next section. My argument here is that platforms and their underlying algorithms do not need to be regulated for the sake of regulating, but because they interfere with public policies. For example, if a national, regional, or local government wants to promote public transport over private transport (because it aims to reduce CO₂ emissions, while the MaaS platform systematically offers the cheapest and most CO₂-intensive route), public policy-makers will find it difficult, if not impossible

to implement their policy. This creates the question of how to regulate digital platforms in their role as policy-makers.

Regulating platforms in public policy-relevant infrastructures

To recall, in the case of public policy-relevant infrastructures – which are typically the case in transport, energy, water and communications, but also in health care and education – digital platforms do influence user behavior and thus affect public policy. This is done thanks to their underlying algorithms, which in turn have been trained thanks to data. The ensuing regulatory questions are therefore as follows: (1) should such algorithms (and such platforms for that matter) be regulated so that they come in line with public policy objectives? (2) Can such algorithms be regulated? And (3) how can digital platforms in infrastructures be regulated, considering that their underlying algorithms constitute their very competitive advantage? Would there be ways to bring digital infrastructure platforms in line with public policy objectives, other than regulating their underlying algorithms? Let me address each of these questions separately:

1. Should digital platforms in infrastructures be regulated? It is obvious that digital platforms in infrastructures do and increasingly will interfere with existing or planned public policies. Therefore, it goes without saying that these platforms, and especially their underlying algorithms, should be brought in line with these public policy objectives, such as less fossil-fuel-intensive transport or energy consumption modes. The question is not whether they should be “regulated”, but whether they can be regulated.

2. The next question is whether such platforms can be regulated, given that they are typically global, whereas public policies are national, regional, and even local; and also given that these digital platforms’ competitive advantage resides in their algorithms, which are by definition a commercial asset of these very digital platforms. Such regulation would either require to make algorithms transparent – for example, an “open algorithm” following the “open data” idea – or force the platform providers to align their commercial objectives with the public policy objectives as much as possible, while letting them free to program their algorithms to their commercial advantage. Despite being suboptimal, the latter is, in my opinion, the only viable option.

3. Consequently, they only viable way may be for public authorities to give licenses (that is, authorizations) to operate to digital infrastructure platform operators, and write public service requirements into such licenses. Should this

be done at EU or at national levels? Can this be done at metropolitan or city level? In any case, the “regulatory power” of the public authorities would thus be reduced to supervising the compliance by the digital platform providers with the license requirements. Again, should such compliance be monitored at the national, regional, or local levels?

This is the current state of my thinking about regulating digital infrastructure platforms’ public services dimension.

References

Agrawal, A., Gans, J. and A. Goldfarb (2018). *Prediction machines. The simple economics of artificial intelligence*. Boston: Harvard Business Review Press.

Domingos, P. (2015). *The Master Algorithm. How the quest for the ultimate learning machine will remake our world*. London: Penguin.

Evans, D. and R. Schmalensee (2016). *Matchmakers. The new economics of multisided platforms*. Boston: Harvard Business Review Press.

Finger, M. (2019). *Network Industries. A research overview*. London: Routledge.

Finger, M. and M. Auduoin (eds.) (2018). *The Governance of Smart Transportation Systems: new organizational structures for mobility*. Berlin: Springer.

Finger, M. and J. Montero (2017). Platformed! Network Industries and the New Digital Paradigm. *Competition and Regulation in Network Industries*, Vol.18, Nos.3&4, pp. 217–239.

Mayer-Schönenberger, V. and K- Cukier (2013). *Big Data. A revolution that will transform how we live, work and think*. London: John Murray.

Parker, G., van Alstyne, M. and S. Choudary (2016). *Platform Revolution. How networked markets are transforming the economy and how to make them work for you*. New York: Norton.

Regulation of Digital Platforms: A Survey of the Economic Literature

Shourjo Chakravorty*

This article reviews some of the notable economic studies on the regulation of digital platforms. I examine how economists view digital platforms as digital markets with an intermediary platform and then consider some studies that discuss the general challenges in regulating digital platforms. I conclude by looking at two papers that study specific issues in the regulation of digital platform in the net neutrality debate and the correct classification of workers that offer their services via online platforms.

Introduction

Some of the most pressing questions in regulation today – whether regarding the net neutrality debate or the correct classification of Uber drivers as independent contractors or employees – are related to digital platforms. This is unsurprising considering the growth of the use of digital platforms in our economic lives over the last two decades. This growth has been facilitated by the development of Internet and communications technology (ICT) during the same time period. We now use digital platforms for communication (for example, WhatsApp and Skype), travel (for example, Expedia), transportation (for example, Uber and Lyft), shopping (for example, Amazon), entertainment (for example, Netflix), accommodation (for example, Airbnb), and may even depend on such platforms for such essential services as electricity in the future.

Although not a comprehensive survey, in this article I discuss the economic studies on the regulation of digital platforms that I feel are some of the most relevant. The remainder of the article is arranged as follows. The second section explains how economists view digital platforms; the third section reviews papers on the regulation of digital regulation in general; the fourth section examines papers on digital platform regulation in specific sectors of the economy; and the fifth section concludes.

Digital platforms in economics

For identification purposes, the definition of a digital platform is of primary importance to regulators and competition authorities. However, there is no single agreed definition of digital platforms among economists despite the existing high-quality research in this area. Spulber (2018) argued that platforms are nothing more than digital markets, which suggests that the economics of markets and the economics of platforms are the same. Traditional economics has focused on production rather than transactions in the marketplace, but the immense success of on-

line marketplaces such as Amazon and eBay and the online facilitation of the sharing economy such as Uber and Airbnb have encouraged the study the role of intermediaries in the market. According to Spulber (2018), the following terms have sufficient overlap to be treated equivalently in economic analysis: markets, platforms, intermediaries, market makers and match makers, market microstructure, organized exchanges, multi-sided markets, multi-sided networks, sharing economy and peer-to-peer markets, and ecosystems. Spulber called for a common terminology so that economic researchers can coordinate their research and avoid duplication of results.

With the increase in e-commerce since the beginning of the century, there have been a number of studies on the economics of platforms. The three seminal works in this area have been Rochet and Tirole (2003), Caillaud and Julien (2003), and Armstrong (2006). All three theoretical analyses investigate the determinants of the prices charged by a platform to the two sides of the market they are intermediating. This provides an indication of where economists, especially those in the field of industrial organization, have focused their interest. It is, of course, important for regulators to understand how digital platforms set their prices if they are to be effectively regulated.

Rochet and Tirole (2003) derived pricing structures for a two-sided market with network externalities for a variety of different economic environments. The authors modeled a platform on which economic value is created when two sides of the market who are the end users of the platform – buyers and sellers – complete a transaction on the platform. Buyers and sellers are heterogeneous, and each agent's surplus increases with the total number of agents on the other side of the market. Rochet and Tirole derived pricing formulae that the platform would implement for its usage on the two sides of market under different circumstances, including if the platform is a private monopoly, a social-welfare maximizer, competes with another platform, has buyers with linear demands, has buyers and sellers who

* Assistant professor, Department of Economics, Istanbul Technical University, chakravorty@itu.edu.tr

can transact on multiple platforms (multihome), and can charge a fixed usage fee along with the price it charges per transaction.

Caillaud and Jullien (2003) analyzed a market in which there are two sides of a market that want to transact with each other, but have zero probability of matching unless they use an informational intermediary. Like Rochet and Tirole (2003), Caillaud and Jullien found that indirect network effects are present in the model in which each member of one side of the market benefits from using the intermediary if there are members on the other side of the market also using the intermediary on the other side of the market. This is because this increases the probability of a match for each member. The authors claimed that this is a representation of an e-commerce market. However, unlike Rochet and Tirole (2003), the populations on either side of the markets are homogeneous and the authors modeled the matching process explicitly. Caillaud and Jullien modeled two intermediary platforms that compete on price. One of the platforms is an established platform or an incumbent and the other is a new entrant. Caillaud and Jullien derived equilibria for a number of different cases, including when users can multihome and platforms cannot use transaction fees but have to rely on a single fixed registration fee. In all cases, the authors found that there always exist efficient equilibria, but that an inefficient equilibrium may exist in the multihoming case. This is important for regulators to know and identify because the main economic objective of the regulator is to maximize total welfare, which only occurs in efficient equilibria. An interesting result of Caillaud and Jullien (2003) is that when users can only use one platform (singlehome), the platforms' profits are eroded by price competition as both try to capture the monopoly position. When multihoming is allowed, the platforms are able to avoid fierce price competition, leading to positive profits in equilibrium. Hence, it is possible that multihoming and the equilibrium in which platforms make a positive profit may not be an efficient equilibrium.

Armstrong (2006) also studied competing intermediary platforms that serve two sides of a market in which network externalities are present. He found that the price a platform charges to one side of the market is determined by how much the benefit the other side obtains from the presence of that side of the market. For example, some nightclubs grant free admission to women not because of the benefit (or lack of) that women enjoy from going to the nightclub, but because a larger female clientele increases the attractiveness of the nightclub to men. Therefore, to compete effectively on one side of the market, the firm needs to perform well on the other side. This leads to

downward pressure on prices on both sides of the market in comparison to the case in which positive externalities are absent. Consequently, platforms have an incentive to decrease network effects. Another interesting finding by Armstrong is that if one side of the market singlehomes and the other side multihomes, then the multihoming side is forced to deal with the singlehoming agent's chosen platform if it wants to interact with the agent. The platform becomes a monopolist in granting access to the singlehoming agents that choose to use it. In the case of a monopoly platform, this leads to high prices on the multihoming side which, in turn, leads to fewer agents being served on this side compared to the efficient outcome. When there are competing platforms, the profits earned from the multihoming side are largely dissipated in the low prices offered to the singlehoming side in order to attract them.

There has been substantial theoretical literature on intermediary platforms and two-sided markets following the three abovementioned papers. However, only a few studies have dealt directly with the question of the regulation of digital platforms. I discuss some of these studies in the next subsection.

General regulation of digital platforms

In this section, I discuss two studies that directly address the problems of regulating digital problems, and one study that sheds light on one of these problems.

Einav et al. (2016) analyzed peer-to-peer markets such as eBay, Uber, and Airbnb that allow small suppliers to compete with the traditional sellers of these goods and services. In their theoretical model, they found that, with a decline in fixed costs such as advertising and visibility allowed by the Internet, the capacity of small sellers may crowd out the dedicated capacity of traditional sellers. For example, the entry of small sellers of rental accommodation via Airbnb may cause Hilton to decrease its future investments. Einav et al. examined the main problems regulators face concerning digital peer-to-peer markets without offering any solutions. The first problem they cited is entry and licensing standards, whereby businesses such as Airbnb and Uber have managed to enter local markets by being able to dodge local regulations. Economically, escaping licensing may decrease welfare because licensing corrects market failures such as unlicensed taxi drivers operating unsafe vehicles. Conversely, licensing may only serve the interests of the incumbent operators such as taxi medallions that restrict entry into the taxi market (Stigler 1971). Hence, the entry of unlicensed new players may increase welfare. The second problem the authors noted is the use of contrac-

tors rather than employees that characterize peer-to-peer businesses. On one hand, some workers may value flexible working hours and demand variability may also favor this type of existing arrangement. On the other hand, market forces may not sufficiently protect workers and employment regulations are necessary. The third problem concerns data and privacy regulation. Peer-to-peer business collect data on their users for matching purposes, setting prices, and monitoring behavior. The question of which rights consumers and platforms should have regarding data is only partly an economic one. Nevertheless, Einav et al. believed that economic analysis is warranted in examining the role of regulating the sharing and use of individual user data. The last issue observed by those authors, which has not garnered much attention, is the question of when to regulate. A characteristic of a peer-to-peer business is that if it is initially successful, it grows exceedingly fast. Because regulations are difficult to change once they have been legislated, it may be wise to take a “lenient early-stage approach to regulation” (Einav et al. 2016). This is because a peer-to-peer business may transform into a very different organization than when it started, and early regulations may become ineffective or unreasonable. However, if regulators wait until a business has expanded, then later regulation may become a long and huge undertaking, given the large size of the business. An example of this is Europe’s intended antitrust action against Google.

Montero and Finger (2017) were concerned with the consequences of digital platforms disrupting traditional network industries with physical assets such as the communications, transport, and energy industries. They argued that digital platforms disrupt traditional network industries in two ways: substitution and commoditization. Firstly, digital platforms such as Uber substitute for traditional industries such as the taxi industry. Secondly, commoditization entails the online platform obtaining a substantial share of the transaction’s value from one side of the market. For example, Skype provides voice over the Internet (VoIP) using the infrastructure provided by traditional telecommunications providers. The authors fear that these disruptions will cause underinvestment in network infrastructure by traditional service providers, which online platforms also rely on for the provision of their services. Montero and Finger then examined regulations in the communications, transport, and energy industries in this context.

One theoretical analysis that tries to examine investment by intermediaries was Spulber (2002), whose model was based on the business-to-business market. In Spulber’s model, buyers and sellers undertake complementary investments in their businesses. His main finding is that

investment levels are efficient when there are two competing intermediaries in comparison to microstructures (1) in which there is no intermediary and buyers and sellers match randomly, (2) when there is a monopolistic intermediary and (3) when there is a simultaneous market of random matching and a monopolistic intermediary.

Digital platform regulation in specific sectors

I finish my discussion by mentioning two papers that investigate two single questions in the regulation of digital platforms in two specific sectors.

I believe that no particular issue has been more debated concerning digital platform regulation than net neutrality. The net neutrality debate is the question of whether Internet service providers (ISPs) should be able to price discriminate by charging content providers (CPs) higher prices for preferential access to broadband transmission service. One notable theoretical study on the net neutrality debate is Choi and Kim (2010). Choi and Kim studied the investment incentives of ISPs and CPs in the net neutrality debate. ISPs such as Verizon and AT&T oppose net neutrality regulations because they argue such regulations decrease their incentive to invest in network capacity. This occurs because such regulations mean that CPs supporting bandwidth-intensive multimedia applications will be charged the same price as CPs, causing less Internet traffic. The proponents of net neutrality (mainly large CPs such as Google and Yahoo and consumer rights groups) argue discriminatory pricing will stifle content innovation. Choi and Kim found that the direction of the relationship between net neutrality and the investments incentives of ISPs and CPs is not unambiguous. For example, capacity expansion of the network that speeds up delivery content of all CPs will decrease the value of preferential access (and hence, the price the ISP can charge for it) in a discriminatory regime. Thus, an ISP’s incentive to invest in capacity may be lower in such a regime than a regime in which it is forced to charge the same price to all CPs.

An interesting theoretical study is Hagiu and Wright (2018), which questioned whether workers that provide their services through online platforms such as Handy and Uber should be considered as independent contractors or employees. This is, to my knowledge, the first formal economic analysis on the welfare implications of the classification (and misclassification) of workers in the sharing economy. An interesting finding of theirs is that, in some situations, an intermediate classification between independent contractor and employee in which case the firm controls some of the actions of the worker while the

worker retains control of the remaining actions may be welfare-maximizing.

Concluding remarks

Although this has not been a comprehensive survey, it should be clear that legislators and regulators are faced with myriad new challenges in the regulation of digital platforms in general, as well as in specific sectors of the economy. With technology progressing in leaps and bounds as it has been for the last two decades, these challenges are predicted to increase. Compared to these growing challenges, there has been a dearth of economic research in this field. Hopefully, this will change in future, with more economic theoretical and empirical research on this subject, which is so desperately needed to guide regulatory policy.

References

- Armstrong, M. (2006), 'Competition in two-sided markets', *The RAND Journal of Economics*, 37(3): 668–691.
- Caillaud, B., and Jullien, B. (2003), 'Chicken and egg: competition among intermediation service providers', *The RAND Journal of Economics*, 34(2): 309–328.
- Choi, J., P., and Kim, B. (2010), 'Net neutrality and investment incentives', *The RAND Journal of Economics*, 41(3): 446–471.
- Einav, L., Farronato, C., and Levin, J. (2016), 'Peer-to-peer markets', *Annual Review of Economics*, 31(8): 615–635.
- Hagiu, A., and Wright, J. (2018). 'The status of workers and platforms in the sharing economy', *Journal of Economics and Management Strategy*, 28(1): 97–108.
- Montero, J. J., and Finger, M. (2017), 'Platformed! Network industries and the new digital paradigm', *Competition and Regulation in Network Industries*, 18(3–4): 217–239.
- Rochet, J., and Tirole J. (2003), 'Platform competition in two-sided markets', *Journal of the European Economic Association*, 1(4): 990–1029.
- Spulber, D. F. (2002), 'Market microstructure and incentives to invest', *Journal of Political Economy*, 110(2): 352–381.
- Spulber, D. F. (2018), 'The economics of markets and platforms', *Journal of Economics and Management Strategy*, 28(1): 1–14.
- Stigler, G. (1971), 'The theory of economic regulation', *Bell Journal of Economics and Management Science*, 2(1): 3–21.

SECTOR COUPLING

9th Conference on the
Regulation of Infrastructures



**SUBMIT YOUR ABSTRACT BY
3 FEBRUARY 2020**

The [Conference on the Regulation of Infrastructures](#) is the annual event that brings together all the Areas of the Florence School of Regulation. The 9th edition of the Conference on the Regulation of Infrastructures will focus on ‘Sector Coupling’ and will take place on 25-26th June 2020 in Florence.

Learn more about the 8th edition of the conference, which took place in Florence on June 20 and 21 2019 [here](#).

[Submit here](#)

Manifesto for the next five years of EU regulation of Transport

An FSR-Transport Vision for Advancing the Single European Transport Area by turning the Challenges of Decarbonisation and Digitalisation into Opportunities



Read the [full publication here](#).

Summary

The recent renewal of the European institutions and the election of a new College of European Commissioners offers an opportunity for European regulation. While the new institutional composition will be in place for the next five years (2019–2024), the legislative and public-spending decisions made under the von der Leyen Commission will have implications for decades to come in terms of shaping the direction of the European transport sector.

The hallmark and the very identity of the EU is the creation of a Single European Market. Over the past 35 years the European Commission has endeavored to further the mobility of goods and people in Europe by removing national barriers, by harmonising technical and operational standards and by creating competition in air transport, railways, roads, and waterborne transport. This has been done mostly by way of a sector-specific approach, an approach which today however reaches its limitations, as mobility – both for passengers and freight – increasingly becomes multimodal. While the last Commission, and especially the outgoing Transport Commissioner Violeta Bulc, identified multimodality as the new frontier and challenge of promoting a Single

European Transport market, the sector-specific approach still prevails and remains engrained in the institutional setup in both the market and its regulation, as well as in the organisation of the Commission itself.

While the completion of the Single European Transport Area continues to be work in progress, new global challenges – namely climate change and digitalisation – are exerting additional pressure, but also offer new opportunities for the European transport sector.

Climate change is set to be a central pillar of the next Commission mandate. Having pledged to deliver a ‘Green Deal’ for Europe in the course of her first 100 days in office, Commission President-elect von der Leyen reaffirmed her commitment to making Europe the world’s first climate-neutral continent by enshrining the 2050 objective into law. Achieving this goal will require vast transformations across all sectors of the economy, including transport.

Digitalisation, on the other hand, is adding a new layer of complexity onto transport; yet, if carefully regulated, it has the potential to advance EU sustainability objectives, while at the same time increasing efficiency, enabling smoother and more customer-oriented operations and, not least, enhancing safety.

This Manifesto shares our vision for how to further the Single European transportation area for goods and people by turning the challenges of smart transport and sustainability into new opportunities for efficiency and competitive services.



networkindustries quarterly

Network Industries Quarterly, Vol. 22, issue 1, 2020 (March)

“Governance of Large Urban Water Systems”

Presentation of the next issue

In this issue we want to explore a new and increasingly urgent topic, namely the question of how to govern metropolitan water systems. We would like to cover both the governance of the water resource, and the water cycle for that matter, and the governance of drinking and wastewater provision. Most of the world’s metropolitan areas have grown and continue to grow rapidly, a process that goes hand in hand with growing water consumption, leading often to falling water tables and degraded groundwater quality, thus leading to the need to source water from ever further away, i.e., from jurisdictions not covered by metropolitan governance mechanisms. Similarly, metropolitan areas, because of their growth, come to encompass water distribution and wastewater management systems falling under different jurisdictions and operated by different companies.

Should you be willing to submit your contribution for this issue, please contact **Prof. Matthias Finger** (matthias.finger@epfl.ch).

OPEN CALL FOR PAPERS

Implementation of the liberalization process has brought various challenges to incumbent firms operating in sectors such as air transport, telecommunications, energy, postal services, water and railways, as well as to new entrants, to regulators and to the public authorities.

Therefore, the Network Industries Quarterly is aimed at covering research findings regarding these challenges, to monitor the emerging trends, as well as to analyze the strategic implications of these changes in terms of regulation, risks management, governance and innovation in all, but also across, the different regulated sectors.

The Network Industries Quarterly, published by the Chair MIR (Management of Network Industry, EPFL) in collaboration with the Transport Area of the Florence School of Regulation (European University Institute), is an open access journal funded in 1998 and, since then, directed by Prof Matthias Finger.

ARTICLE PREPARATION

The Network Industries Quarterly is a multidisciplinary international publication. Each issue is coordinated by a guest editor, who chooses four to six different articles all related to the topic chosen. Articles must be high-quality, written in clear, plain language. They should be original papers that will contribute to furthering the knowledge base of network industries policy matters. Articles can refer to theories and, when appropriate, deduce practical applications. Additionally, they can make policy recommendations and deduce management implications.

Detailed guidelines on how to submit the articles and coordinate the issue will be provided to the selected guest editor.

ADDITIONAL INFORMATION

MORE INFORMATION

- network-industries.org
- mir.epfl.ch
- florence-school.eu
- ic4r.net

QUESTIONS / COMMENTS?

Irina Lapenkova, Managing Editor:

irina.lapenkova@eui.eu

Ozan Barış Süt, Designer:

ozanbarissut@gmail.com

Published four times a year, the **Network Industries Quarterly** contains short analytical articles about postal, telecommunications, energy, water, transportation and network industries in general. It provides original analysis, information and opinions on current issues. Articles address a broad readership made of university researchers, policy makers, infrastructure operators and businessmen. Opinions are the sole responsibility of the author(s). Contact fsr.transport@eui.eu to subscribe. Subscription is free.



LATEST ISSUES

- Vol 21 - No. 4 (2019)*
Regulating Digital Platforms
.....
- Vol 21 - No. 3 (2019)*
Digital Platforms – The New Network Industries? How to regulate them?
.....
- Vol 21 - No. 2 (2019)*
Current Issues in Turkish Network Industries
.....
- Vol 21 - No. 1 (2019)*
Regulation of the Railway Industry
.....
- Vol 20 - No. 4 (2018)*
The path towards digitalisation in road infrastructure
.....
- Vol 20 - No. 3 (2018)*
New network structures: decentralization, prosumers and the role of online platforms
.....
- Vol 20 - No. 2 (2018)*
Regulation for Artificial Intelligence and Robotics in Transportation, Logistics and Supply Chain Management
.....
- Vol 20 - No. 1 (2018)*
Governing Energy Transitions: strategic challenges of local utility companies in the Swiss energy transition
.....