Digital Platforms – The New Network Industries? How to regulate them?

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Digital Platforms – The New Network Industries? How to regulate them?

Digitalisation is transforming all industries, including the network industries. It is creating a new model of industrial organisation using online platform as intermediaries for multisided markets. As a matter of fact, digital platforms display all characteristics of the traditional network industries: network effects, efficiency, scale, concentration, market power, etc.

The involvement of online platforms in the network industries benefits consumers by fulfilling unmet needs, often efficiently and at low cost. Platforms do this partly by exploiting access to existing network infrastructures that are often vital for national economic growth and wellbeing. However, if online platforms are allowed to sideline traditional network operators, it may mean that vital investment in building and maintaining the infrastructures on which these markets are founded becomes unsustainable in the long-term.

Another pertinent issue concerns the regulatory approach to platforms, as the success of online platforms is achieved, in part, by exploiting regulatory environments that place incumbent firms at a disadvantage. There is a debate as to whether platforms should be subject to the same regulatory obligations as traditional network players, and whether platforms should have access to network services under regulated terms.

Following the **8th Conference on Regulation of Infrastructures,** which took place on June 20 and 21, 2019 with a particular focus on the key challenges of digitalisation for traditional network industries in the transport, telecoms, water and energy sectors, four papers were selected for this publication due to their topical relevance.

This special issue opens with an introductory article by the Members of the Scientific Committee of the conference, Professors of the Florence School of Regulation, **Montero and Finger,** who consider digital platforms as the new network industries and explore the network effects created by platforms.

Fuentes et al. looks at the electricity sector, which is navigating major disruptions that are changing the regulatory and business landscape. The paper addresses whether these changes would help or hinder electrification, taking transportation as an example.

Becchis, Postiglione and Valerio examine how platforms are giving rise to a series of regulatory challenges, with a focus on their legal definition, labour-related issues in the digital sphere and the role of data between privacy protection and competition.

Knieps analyses the problem of division of labour among all-IP broadband network providers, virtual network service providers and platform operators concomitant with the implementation of adequate governance structures.

Ducuing analyses the phenomenon, when several (contemplated) data sharing legal regimes appear to essentially recognise and regulate data as an infrastructure, although without explicit reference to this notion. Her research is based on three cases, namely the Open Data and PSI Directive, the on-going institutional discussion on the governance of in-vehicle data and the freshly adopted regulation of data in the Electricity Directive.

dossier

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Digital Platforms as the New Network Industries

Juan José Montero*, Matthias Finger**

A new type of industrial and social organisation model is rapidly emerging in the form of digital platforms in multi-sided markets. These digital platforms allow groups of millions and even billions of users to interact via the internet and match their respective needs by way of sophisticated algorithms. Network effects play a central role.

1. Direct network effects

Firstly, platforms can create larger direct network effects. Traditional network industries created direct network effects by heavily investing in infrastructure to be shared by users. Network effects were driven by supply. They were usually limited in geographic scope to a country (or to a part of a country). Platforms, on the contrary, build network effects by pulling together demand and then connecting it to supply. Investment is necessary to aggregate demand, but not at the level of investment required to create and maintain infrastructure.

Aggregation takes place at the data layer, and the low transaction costs in the virtual world make it possible to aggregate demand faster and wider than traditional players in the network industries. This is why platforms do not usually operate at a local not even at a national level, but they usually have a regional and even a global reach.

Digital platforms grow larger network effects than traditional network industries. They largely outnumber traditional players in number of customers. WhatsApp has more than 1.5 billion users worldwide, outnumbering the largest telecom carrier in the world, China Mobile with 925 million customers, and certainly the largest carriers based in Europe (Vodafone has 500 million users) and the US (Verizon has around 150 million users).

2. Indirect network effects

Secondly, platforms create indirect network effects. Platforms can connect not only large numbers of individuals in homogenous groups, but two different groups (two-sided markets) and more than two groups (multi-sided markets). A good example are transport platforms connecting passengers and different transport providers (taxis, scooters, public transit services, etc.).

This is possible because of the reduction of transaction costs. Technology makes it possible to connect large and heterogeneous crowds, creating new and valuable ecosystems.

Indirect network effects are very powerful for two different reasons. Firstly, it is self-evident that the more groups can interact in a platform, the larger the scale and the larger the network effects are. Secondly, and this is not so obvious, the possibility to have very different groups interacting, creates new network effects, a coordination that previously did not exist and that might create new value on top of the value created by the mere aggregation of large number of users.

Platforms and indirect network effects in multi-sided markets allow the coordination of previously fragmented complex systems. Actually, the creation of value by coordinating different groups of users is the deepest transformation created by digital platforms in the network industries. Network industries often form a very complex ecosystem with a large number of players. The coordination of all the players consumes significant resources and traditionally has not reached efficient results.

In complex systems as the network industries, only the coordination of the different players can ensure the most efficient outcome. Digitalisation allows infrastructure managers a more efficient management of the load factor by the use of predictive algorithms and the dynamic management of capacity in the infrastructure. But there are limits on the results that can be obtained individually by an infrastructure manager disconnected from the rest of players. The dynamic coordination of a complex ecosystem with multiple players requires the coordination of the different players. This is the opportunity for a platform in a multi-sided market.

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3. Data network effects

Thirdly, platforms create data network effects, as ever larger pools of data improve algorithms thanks to machine learning technology. For example, a search engine improves as more users search on it; translation software improves as users make more and more automatic translation. The more data a platform has, the better it can play its role as coordinator of a complex system.

Data network effects are fundamental for the operation of platforms. The scale and complexity of the interactions in sophisticated multi-sided markets require the most efficient management by the platform. Negative network effects such as congestion and poor coordination results can destroy a platform. Only the best predictive algorithms fed with large amounts of data are in the position to efficiently manage the massive amount of interactions among massive pools of users of a very different nature.

This is clearly the case of platforms in traditional network industries. A platform dynamically matching passengers and different transport service providers has to take into account a massive amount of input. It has to take into account the individual choices of passengers, the availability of supply of each transport mode, the state of traffic, etc. Similarly, an electricity platform will have to dynamically take into consideration the evolution of the different suppliers of electricity (i.e. will the sun shine in two hours so as to generate enough electricity in the panels installed in the roofs of a neighborhood, or will it be necessary to rely on a large natural gas power plant far away from the city?) and the erratic demand of very different users such as businesses, homes, electric cars, etc.

Data network effects are relevant, as the more data a platform has, the better it will be in the position to dynamically coordinate complex systems thanks to predictive algorithms.

These three network effect reinforce each other. The more users, the better the algorithm, and the better the algorithm, the more users and the more categories of users can efficiently interact through the platform.

4. The transformative power of network effects

It is important to identify that digital network industries rely on network effects just as the traditional network industries. Direct, indirect and data network effects are the reason behind the efficiency and the competitive advantage of digital platforms. Just as traditional network industries transformed the economy and the whole society a century ago, digital network industries are transforming the economy and society today.

The digital network industries rely, just as the traditional network industries, on standardisation and scale. Standardisation is a requirement to build scale. Telephone, railway and electricity infrastructures had to be standardised in order to be integrated into large scale networks. In the same way, standardisation is necessary in order to build large digital networks. For instance, transportation services mediated by digital platforms have to be standardised as to be presented to passengers as recognisable services. Even the price has to be standardised in order to streamline transactions. Even if technology allows the personalisation of the services made available to the demand side, such personalisation is always a pale mirror image of the rich and often gaudy diversity in reality, based on a profiling that standardises preferences according to presumed patterns.

Scale is the defining attribute of network industries. Network effects grow as scale grows. Traditional network industries create scale in the supply side, by integrating supply into a single monopolistic infrastructure. Demand had to adapt to the single supplier, not always without opposition, as raising prices were feared. Digital network industries build scale as they integrate demand and then connect it with supply. Scale is not to be found anymore in a large supplier, but in a large pool of users of the platform, both in the demand and in the supply side. It is the size of the platform which creates the network effects, not the size of the suppliers of the underlying service (telecoms, transport, energy, etc.)

These new network effects bring dramatic increases in efficiency. The transformations brought by such efficiencies are as powerful as the transformations brought by economies of scale thanks to industrialisation and the corresponding emergence of the traditional network industries during the turn of the 20th century. Back then, industrialisation created tensions and gave rise to social movements by displaced farmers and artisans. Millions of workers and organisations are again being substituted and displaced today (e.g., written and audiovisual content producers, taxi drivers) and millions of individuals and organisations start working for obscure algorithms. Social movements again are on the rise.

5. Market concentration

The new network effects are leading to a new round of concentration and market power, this time no longer only at the national or regional, but now also at the global level. Growing concentration and 'winner-take-all'-effects in media, telecommunications and transport platforms pose a fundamental challenge not only in economic, but in

broader social terms, as well as at political levels. At the same time public debate about this can actually be controlled by a few gatekeepers.

As a consequence, the concentration of economic and political power seems to be a reason of concern today as it was a century ago when the traditional network industries emerged. It took back then more than 30 years to understand the ultimate reasons behind the concentration of power, both the legitimate (scale and network effects) and the illegitimate ones (systematic strategy to monopolise markets) and to define the legal remedies benefit from efficiency while ensuring the common good. It should not take that long to adapt the existing regulatory framework to the new network industries, once it is understood that they are not that different from the old network industries.

This is becoming urgent, as the concentration of economic and political power today is creating similar problems as those faced a century ago: "Corruption dominates the ballot-box, the Legislatures, the Congress […]. The people are demoralized; [...] The newspapers are largely subsidized or muzzled, public opinion silenced, business prostrated, homes covered with mortgages, labor impoverished, […], imported pauperized labor beats down their wages, […]. The fruits of the toil of millions are badly stolen to build up colossal fortunes for a few, unprecedented in the history of mankind; and the possessors of these, in turn, despise the Republic and endanger liberty." This is not the reactionary and xenophobic declaration of a 21st century anti-globalist. This the text of an 1892 Manifesto by I. Donnelly, the leader of the Populist Party in the US.

6. Parallelisms and differences

Network effects are at the center of the digital revolution. It is for this reason that we propose to label platforms as the new network industries. We believe digital platforms – for example, in the areas of mobility (e.g., mobility platforms) - or energy (e.g., energy services platforms) constitute a new type of infrastructures, albeit a digital form of infrastructure.

However, one should not conclude that the traditional and the new network industries end up being identical in all of their dynamics. There are relevant differences between the traditional and the new network industries, and even between the different digital network industries.

The main difference is that digital platforms require a smaller investment to create network effects than the infrastructure based network industries. Traditional network industries, and in particular railways, pushed the frontier of the capital markets and were behind the creation and growth of such relevant capitalistic institutions as corporations, banks, stock exchanges, etc. Modern infrastructure required a concentration of capital previously unknown. Digital network effects require massive capital to grow to global almost universal presence. As explained growing platforms is a business in itself, a capital intensive business. But the capital required to build digital platforms is far away from the capital to build physical infrastructure.

Another relevant difference is dynamism. Physical infrastructure is quite static, and once it is deployed, it usually has a long life-cycle that can easily run into decades. Technology certainly plays a role in infrastructure, and improvements have taken place over the last century. But improvements have been incremental, not a revolution, and slowly implemented. Digital network industries relay on software that can be easily modified. Actually, platforms are constantly testing new features, and the response by users monitored and measured. New features deployed for limited parts of the customer are expanded to the whole community if successful, from small changes in color in the graphical interface, to new incentives for the different sides in the multi-sided market. In any case, it is important to recognise that dynamism is more relevant in the early stages of a new digital market, and that once a business model proves successful, platforms become more stable. This has been the case with search engines, social networks, etc. Actually, the short life-spans of the early internet front-runners (Yahoo, Myspace and so many forgotten internet stars) has given pass to very solid position of companies such as Google, Facebook and Amazon, leaders for 10 or 15 years in their segments.

The geographic scope of the traditional and the new network industries is different. Infrastructure based networks have always tended to be limited to a set territory, often within the borders of a country. Large countries as the US or China have large networks. Some operators have expanded across jurisdictions, with irregular success, but no global players have emerged in telecommunications, energy and most of the transport industries. Platforms, on the contrary, have easily grown global. This is the case of multi-platforms around Google, Facebook, Amazon and Apple. The only limitations seems to be political, as some governments in large countries have blocked the expansion of US-based platforms to support their own local platforms, particularly in Russia and China (with a great success in China, the most populated country in the world).

Finally, regulation is another significant difference. Infrastructure-based networks are very heavily regulated by the authorities of the territories where they are deployed. Actually, much of the regulation has been designed in order to maximise network effects: monopoly rights, access and interconnection obligations, etc. Digital networks are

subject to a very light regulation. Different reasons explain this fact. Firstly, deployment usually does not require the previous consent of the authorities in the form of licenses, concessions for the use of public land, etc. Secondly, market failures can only been identified once new services mature and better understood by the regulators, so it is understandable that only at this stage, once platforms start to mature and the downsizes of their operations become apparent, regulation starts to be discussed. Thirdly, the large scale and multinational presence of the leading platforms are a challenge for national authorities. Only the very large countries or regional institutions such as the European Union have the power and reach to really subject the new giants to their regulations.

7. Regulating the new network industries

Needless to say at this stage that these powerful network effects in the new network industries require regulation. The network industries paradigm has proven useful to understand and regulate the traditional network industries. Telecommunications, transport and energy present common traits due to the relevance of network effects, the tendency to concentration (with economic and political consequences) and the relevance of these services for society. Of course the different sectors present specificities derived from the technologies they use and the economic conditions which are specific to them. However, the network industries have proven useful to define the regulatory conditions for the exploitation of these networks. It does not mean that the same regulatory conditions have been applied to all these industries. However, common themes have been identified and similar solutions have been identified for the different industries.

In the same way, it is our understanding that the network industries paradigm is the most useful to understanding and regulating digital platforms. It does not mean that the regulatory framework developed over decades for a competitive telecommunications industry, for example, should be automatically extended to digital platforms. Traditional and new network industries are different, just as the traditional network industries were different among themselves and the new platforms are also different among themselves.

But the market failures that are emerging in the new network industries are too familiar for the network industries crowd, and in particular for the academics and practitioners following the telecommunications regulation debate over the last decades: how to reconcile vigorous competition with the efficiency derived from network effects, scale and concentration and, at the same time, ensure social objectives such as universal access to services under fair and equal terms.

Regulation should start with the recognition that platforms are not the providers of the underlying goods and services, but they merely provide intermediation services. They favour the contracting between third parties, supply and demand. This can take various legal forms. Intermediation, in any case, is a service prone to conflicts and very often regulated or at least subject to codes of conduct. It is our proposal that the basic regulation of the digital platforms should be inspired by the existing regulation on intermediaries: transparency, fairness, redress mechanisms, these are basic principles that should inspire the regulation of the intermediation services provided by the digital platforms.

But digital platforms cannot be regulated as mere traditional intermediaries. As a market is platformised, platforms play a key role as organisers of the market. They are in the position to determine the conditions of the provision of the service (standards, prices, schedules, etc.). This role as superintermediaries has to be recognised and specific regulation adopted accordingly.

For instance, as platforms are determining some of the conditions for the provision of the underlying service, they should have some liability for such services. At the same time, since platforms have an unbalanced power relationship with the providers making use of the platform to reach customers, it might be sensible to protect providers imposing some regulatory obligations on the platforms. The most exploitative instructions in the algorithms could be prohibited (like unrealistic expectations in terms of timing of the services or penalties in case an individual rejects a service). Minimum payments could be imposed on platforms. Even more, platforms could be forced to provide insurance to such individuals in case of accident or illness. Regulation could be inspired by the traditional objectives of labor law, but without automatically extending all the restrictions of labor law to a business relationship which is different in nature.

Finally, platforms can reach a market power that rarely is obtained by traditional intermediaries. Only a very limited number of platforms can reach the volumes to create the powerful network effects in each multi-sided market. In some markets, only one platform provides the service. This is very different in many traditional intermediation services, where strong competition exists among a large number of brokers, agents, etc.

Different remedies are being considered for the regulation of digital platforms with market power. Many of them are inspired by the regulation of the tradition network industries, particularly telecoms.

There are growing voices calling for structural remedies in the form of the divestiture of the most powerful platforms, just as AT&T was divested in 1981. We think horisontal separation, breaking platforms into smaller platforms providing the same service, would kill the network effects that create spectacular efficiencies, so it is not advised in general as a remedy. However, it might be analysed for some very particular cases, such as advertising financed platforms affecting pluralism and other basic public goods. On the contrary, the vertical separation of the roles of intermediary and provider of underlying services might be of interest in order to avoid very fundamental conflicts of interest and the extension of dominant positions from the intermediation market to the market of the provision of the intermediated services. Vertical unbundling in the electricity and railway industries are interesting precedents.

Behavioral remedies in the form of specific obligations to reduce barriers to entry and facilitate platform competition are under consideration. Multi-homing is a reality in many cases. Users can join more than one platform so there is competition between them. Multi-homing can be facilitated by obligations such as data portability (inspired by number portability in telephony). However, multi´-homing is not universal, as high costs and other barriers make it unfeasible in other cases. Access regulation, also called interoperability, has been the ultimate remedy in traditional industries to ensure competition while fully benefiting of network effects. If the dominant platform is obliged to share the network effects with smaller competitors, network effects are not diminished but actually increased, and competition can then ensure that benefits are appropriately shared across the ecosystem, making it sustainable.

In short, we think that the expertise built over a century of competition and regulation in the traditional network industries constitutes a solid basis when it comes to facing the challenges of the new network industries. Expertise in the traditional network industries provides the most solid knowledge of network effects, be they direct or, in the case of digital platforms, indirect, as well as the new data network effects. Experts in network industries know how the network industries have been regulated in the past and can therefore assess how they are affected by digital platforms. Consequently, they can contribute to the discussion on how the interfaces between the traditional network industries and the digital platforms should be regulated. Finally, they are sensitive to public service considerations and the need to introduce such considerations into the regulatory equation of the new network industries, and which goes further than the regulation of network effects and market power.

References

Evans, D. S. & Schmalensee, R. (2016), *Matchmakers. The New Economics of Multi-sided Platforms*, Harvard Business Review Press, Boston;

Finger, M., Bert, N., Kupfer, D., Montero-Pascual, J. J., & Wolek, M. (2016). *Research for TRAN committee: infrastructure funding challenges in the sharing economy*.

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.

OECD (2009), *Two-Sided Markets*, Policy Roundtables.

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.

From the 'iPhone effect' to the 'Amazon' of Energy[1]

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Meeting climate change goals requires both the decarbonisation of the electricity sector and the electrification of much of the rest of the economy. However, the electricity sector is navigating major disruptions that are changing the regulatory and business landscape. We address whether these changes would help or hinder electrification, taking transportation as an example.

1. Introduction

Meeting climate change goals requires both the decarbonisation of the electricity sector and the electrification of much of the rest of the economy. However, the electricity sector is navigating major disruptions that are changing its regulatory and business landscape. New distributed energy resources (DERs), a combination of distributed generation, storage and digitalisation, allow households to generate, consume, shift and reduce their electricity consumption, largely bypassing traditional utilities. This paper focuses on whether these changes to the electricity sector will help or hinder further electrification, taking transportation as an example. This is an interesting question because electricity and transportation, both traditional sectors, are experiencing deep transformations and could have an intertwined future: electricity could provide the basic 'fuel' for transportation, while transportation could be the major engine for growth in electricity demand.

In both industries, the combination of different but complementary new technologies challenge the dominant business model. We call this the 'iPhone effect.'[2] In the power sector, the combination of photovoltaic (PV) panels + batteries + demand response gadgets would allow households to bypass utilities' services and even disconnect from them altogether (Fuentes-Bracamontes, 2016; Glachant, 2019). In the transportation sector, the combination of sharing technologies + electric vehicles + automation would free consumers from the need to own a car (Fulton et al., 2017; Sprei, 2018, The Economist, 2017a).

We therefore explore whether new electricity and transportation technologies together could create an even bigger 'iPhone effect', arguing that businesses in both sectors will eventually offer aggregated services, repackaged as subscriptions, and traded on digital platforms. We also argue that the data created by such activities could be so valuable that this alone would reinforce such a move.

2. Potential synergies in electricity and transport disruptions

This section identifies the potential synergies in the application of new technologies in both sectors. We argue that together these synergies could result in a supply shock with a significant impact, leading to lower implicit prices and a rebound in the use of electricity, driven by increased levels of transportation.

2.1 Killing two birds with one stone!

Batteries are the common hardware components in new electricity and transportation technological disruptions. They are necessary for households to become energy independent and for electric vehicles (EV) to be viable. As such, the more storage technologies improve, the more they enable a virtuous power-transport circle. Improving battery storage capacities would allow EVs to travel longer distances with a single charge, and would make it easier for more households to become independent from a utility. EVs can also contribute to the development of the smart grid by charging during off peak hours, providing back up power to the grid and helping to incorporate other clean, renewable, zero marginal cost technologies. Reducing the cost of batteries would be welfare enhancing since it would

[1] Based on the paper "The 'iPhone effect': The Impact of Dual Technological Disruption" presented at the 8th Conference on the Regulation of Infrastructures- Digital Platforms. Florence, Italy, 20-21 June, 2019

[2] The iPhone was so disruptive in the telecommunications sector because, at its early stages, it bundled at least three different technologies: a telephone, music player, and camera together in one device.

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also reduce the total cost of providing services in the transport and power sectors. This could also increase the use of batteries, leading to economies of scale, which would trigger further a virtuous circle between electricity and transportation services.

2.2 Platforms, Subscriptions and Horizontal Integration

This sub-section argues that electricity and transportation business models would converge as a result of technological disruptions. Having this convergence in their business models would likely create synergies that might eventually lead to more vehicle miles traveled and more electricity consumed than if the services were offered independent of one another.

Electricity and transportation services could be traded on platforms and offered as bundled subscriptions. Since services are intangible and heterogeneous, service providers need to package services in a way that establishes the delivery unit, the scope and number of actions that constitute a delivered service. Because of the cost structure of new technologies, we suggest that electricity could be traded in long-term fixed price schemes, such as memberships or contracts, in which energy services could be combined. It is interesting to then explore how transportation might also follow such a path. Mobility is highly predictable most of the time. During weekdays, people go to and come from work and school at the same times, similar to electricity baseload demand. For some people, peak demand for transportation might be those trips that diverge from their usual schedules, such as visits to the dentist, or a party on the weekend. As such, the prices for these services could be based on fees for basic and premium services. Peer to peer mobility apps could offer subscriptions for a given number of scheduled trips, with unscheduled add-ons. This would be similar to the two-part tariffs of mobile contracts, where the consumer pays for a number of minutes of calling time per month with extras at a premium.

In transportation, peer to peer mobility apps, like Uber or Lyft, already operate on digital platforms. On the electricity side, DERs can transform power markets into a series of nested markets connected through different platforms as if they were multiple sided markets: a meeting place for a number of agents that interact through an intermediary or platform. The important part is that these platforms can create demand-side economies of scale, known as network externalities. Katz and Shapiro (1985) ascribe indirect network externalities to any situation where complementary goods become more plentiful and cheaper as the number of users of the goods increases. Electricity and transport can be mutually complementary services. If the electricity price fell relative to the price of gasoline or diesel as a result of technological disruption, this would lead to an increase in electric mobility. If technological changes in transportation lead to an increase in electric vehicle miles traveled, electricity use also increase as a result.

Coupling transportation and power services in one platform could generate synergies between the two. When we say that electricity and transportation will be traded on platforms, we need to distinguish between the physical platforms through which electricity is delivered- the transmission and distribution network- the physical network through which transportation is 'consumed'- road, rail, etc.- and digital platforms. Contrary to physical networks, where after a certain point they can become congested or stop taking new users, digital platforms have more capacity as the marginal cost of adding one more user can be close to zero, and the fuel that is used to run these platforms, data, is a non-rival in consumption. Therefore, this horizontal integration could leverage the sunk costs of these platforms and, by adding services to them, they could be traded with lower overheads and lower transaction costs.

2.3 Data and predictability

Digitalisation is another common technology in the disruption of the electricity and transportation sectors. Through the use of data, digital platforms can coordinate multisided markets. The proposition of this sub-section is that the use and monetisation of these data, generated as a byproduct of electricity and transportation, while having the electricity and transportation, could constitute an important revenue stream for firms (Foroohar, 2019, The Economist, 2017b). The consumption of electricity and transportation is highly habit dependent and therefore predictable. Transacting these services on digital platforms and via subscriptions would generate behavioral data. Such data could help companies predict the aggregate household demand for power and transportation more accurately, which could lead to operational costs savings. For example, it would be possible to link information on the time consumers leave their places of work, the approximate time of their arrival at home, and the sequence of appliances they use when they arrive. This could help transport and electricity companies plan for capacity expansion and utilisation.

2.4 Local Focus

Another consideration is the geographical aspect of new technologies. With more DERs being deployed, the boundaries between transmission-distribution and distribution-commercialisation and generation are increasingly blurred, as these processes would occur more often in

the same place, the household. On the other hand, the transport revolution discussed here is, in essence, an urban phenomenon (Fulton, 2017). As such, policies at the municipal level could gain relative preponderance on the development of these two sectors, while national policies would see their influence reduced. This would present new challenges for electricity companies used to national policies but increasingly subject to more municipal legislation. The governance of both sectors would change, involving a different set of stakeholders. Electricity and transport companies could work together on overcoming the difficulties associated with the complexities of these new business models. This would help to reduce the cost of doing business for both types of companies.

2.5 How similar are the disruptions in the power and transport sectors?

We have argued in favor of potential synergies and shared challenges for electricity and transportation new technologies. However, there are also significant conceptual differences between these technologies that we cannot ignore. The consequences of these contradictions/inconsistencies might lead to some of the synergies discussed before, like the horizontal integration, not to come to full effect.

DERs are a move from a centralised to a distributed system, while ride sharing apps make the reverse transition. DERs have the potential to shift the energy market from the classic centralised model of energy provision toward a distributed system, where households make more granular decisions. Transport is in essence a distributed system that would be moving towards a more 'centralised' system, through a digital network that concentrates and predicts decisions made by individuals through using data produced by these technologies.

Another barrier to access the benefits of these synergies is that there may be other policies with conflicting objectives already put in place. For instance, the road system may not be adequately prepared for an increase in transport. This would be evident from any congestion of physical infrastructure, with all the externalities associated with that.

3. Regulatory Implications

We argued that through the horizontal integration of these two sectors in a single platform, companies would obtain economies of scale, lower transaction costs, and obtain complementary data sets, potentially producing a rebound effect that could lead to increased demand for mobility and electrification. Assuming that these objectives are not at odds with other policy objectives, like reducing urban congestion, if renewable sources generated electricity, this could help address the aforementioned climate change problem.

How then can we make sure that these synergies occur? Should this be left entirely to markets? Does regulation play a role? One positive aspect for regulation could be the local focus of this transformation. How to regulate digital platforms infrastructure is an open question that would require innovative approaches. Local jurisdictions, rather than national or supranational entities, may have more flexibility to come up with new regulatory frameworks.

4. Conclusion

If the technological disruptions described above come into full effect, they would threaten the viability of the dominant paradigms in both the electricity and transportation industries: the utility as the means to provide electricity and the solo car ownership model. We have therefore attempted to consider whether the demise of these two paradigms point to the electrification of more sectors in the economy? We argued that there are potential synergies between these two disruptions, and that when they are put together, can create an even greater 'iPhone effect'.

We finish with a provocation, in line with Grossman (1986). If the future of electricity and transport is intertwined, where would one draw the line of how many more services to include? If horizontally integrated firms exist to reduce transaction costs, why not further extend the firms' boundaries? When should a firm 'produce' and when should it 'buy'? What would be the equivalent of 'Amazon' in the energy sector? These are questions for future research.

References:

Foroohar, R. (2019). Big Tech must pay for access to America's 'digital oil'. Financial Times, https://www.ft.com/content/fd3d885c-579d-11e9-a3db-1fe89bedc16e, accessed 9 April 2019

Fuentes-Bracamontes, R. (2016). Is unbundling electricity services the way forward for the power sector?. The Electricity Journal, 29(9), 16-20.

Fulton, L., Mason, J., & Meroux, D. (2017). Three revolutions in urban transportation: How to achieve the full potential of vehicle electrification, automation, and shared mobility in urban transportation systems around the world by 2050 (No. STEPS-2050).

Glachant, J.M. (2019). New business models in the electricity sector. EUI Working Paper RSCAS 2019/44, Florence, Italy.

Grossman, S. J., & Hart, O. D. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. Journal of political economy, 94(4), 691-719.

Katz, M. L., & Shapiro, C. (1985). Network externalities, competition, and compatibility. American economic review, 75(3), 424-440.

Knupfer, S., Noffsinger, J. and Sahdev, S. (2018). How battery storage can help charge the electric-vehicle market. McKinsey & Co. https://www.mckinsey.com/business-functions/sustainability/our-insights/how-battery-storage-can-help-charge-the-electric-vehicle-market, accessed 17 April 2019

Sprei, F. (2018). Disrupting mobility. Energy Research & Social Science, 37, 238-242.

The Economist (2017a). The death of the internal combustion engine. https://www.economist.com/leaders/2017/08/12/the-death-of-the-internal-combustion-engine, accessed 18 April 2019

The Economist (2017b). The world's most valuable resource is no longer oil, but data. https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data, accessed 9 April 2019.

Regulating the Platform Economy: Problems, Challenges, Tools

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Platform-based organisations are assuming increasing importance in the provision of both old and new services. This paper shows how platforms are giving rise to a series of regulatory challenges, with a focus on their legal definition, labour-related issues in the digital sphere and the role of data between privacy protection and competition.

Introduction

New opportunities given by the Internet and by the evolution of connectivity technologies and devices have made it possible to bring together demand and supply in a wide spectrum of markets, dramatically reducing transaction costs and awakening assets that have economic potential. Furthermore, real-time technologies enable economic players to be constantly connected and active, both as consumers and suppliers of services, with relevant effects in terms of potential for growth of new business models.

The combination of technical advancements and socio-economic factors led to the rise of what has been labelled as 'sharing economy', 'collaborative economy' or 'collaborative consumption' (Botsman and Rogers 2010). A central role is played by the concept of a 'platform', intended both as a digital place where demand and supply meet each other and as an organisational entity that supervises the realm of the transactions between the two sides of such digital markets.

Major efforts have been made to address the aspect of competition between old, traditional industries and new players such as platforms (Uber, Airbnb, etc.). However, existing regulation does not seem effective and sufficient to respond to emerging challenges.

The aim of this paper is to show the most relevant and complex aspects of the platform economy, thus providing policymakers and stakeholders with a theoretical toolbox and a more general vision.

Trust

Trust and reputation lie at the core of markets evolution, maturity and destruction, and public policy should never underestimate them.

In the domain of platforms, the main potential obstacle to the development of trust and safety in transactions is represented by a particular case of market failure, labelled by the economic theory as 'information asymmetry'.

An information asymmetry is 'an issue in any market where the quality of goods would be difficult to see by anything other than casual inspection' (Akerlof 2003) and consists of an uneven distribution of information about the quality of a good between the seller of that good and its potential buyers. This asymmetry can sometimes lead to the collapse of a transaction or even of entire markets. Platforms cope with this potential factor of market failure by adopting public peer review mechanisms, based on rating systems which allow both parts of a transaction to evaluate each other. This unveils the agents' behaviours, prevents opportunistic conducts that could make markets collapse, and aligns demand/supply incentives.

In the digital world, trust is also important from an antitrust perspective. In this case, the key concept is trust portability: can platform users transfer the social capital (in terms of trust and reputation) they accumulated on one platform to another platform?

Trust portability could be an important tool for lowering barriers to entry for new platforms, thus promoting a more competitive market structure. However, the advantage deriving from the use of a platform is often determined by the so-called network externalities; that is, the existence in the same place of a large number of potential consumers and suppliers searching for the opportunity to be matched and to transact. When a platform is characterised by a high level of network externalities, the cost of switching and leaving such a dense network is potentially too high. This can lead to the persistence of monopolistic markets, making trust portability unable to generate a more competitive market structure.

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Microeconomics of platforms, market disruption and legal aspects

A first step towards classifying different types of platforms should be based on understanding their economic goals and motivational roots. According to this approach, it is possible to outline the following taxonomy:

• Consumer platforms, managed on a voluntary basis by participants and driven by the goal **to gain market power** in buying goods and services;

• Platforms that **intermediate** between demand and supply, gaining a fee for each transaction and allowing parties **access to a specific good or service**;

• Platforms that **offer users the possibility to interact without charging any fee**, with the final goal of acquiring data to be monetised by selling them to other service providers.

Platforms that intermediate have seen the largest expansion in recent years, disrupting sectors such as commerce, mobility, travel services and accommodation.

The microeconomic foundations of platforms development lie in two distinct features of goods and needs (a and b) and a peculiar market effect (c):

(a) Granularity and underutilisation of indivisible assets

(b) Pulverisation/customisation of needs

(c) Network effect.

The matching between under-utilised resources and pulverised needs is enabled today by technological means that greatly reduce the costs of searching, negotiating and executing (that is, transaction costs) and lie at the basis of the success of platforms.

The ability to abate transaction costs explains part of the expansion of digital markets (DMs). In fact, DMs show also low/zero marginal costs (COEURE 2015). This means that the cost of producing one more unit of a service is near zero from the viewpoint of a platform owner. In the case of Uber, for example, the cost of supplying one more ride is up to the driver, not the platform.

Furthermore, from the demand viewpoint, DMs are characterised by low price-comparison costs and high inspection costs (COEURE 2015). However, the latter can be easily reduced by the availability of peer review systems, which – as already seen – erase the problem of information asymmetry.

These features, together with the advantages deriving from the so-called network effects or network externalities that tend to characterise digital marketplaces, explain the ease with which DM operators like platforms disrupt traditional industries.

Such disrupting market behaviour has been challenged by incumbent players in legal terms on the grounds of unfair competition. This forced regulators to understand how to define platforms in order to apply the most appropriate competition regime, with concretely relevant consequences as in the case of Uber.

At the end of 2017, the European Court of Justice (ECJ) refused to consider Uber as part of the family of digital markets classifying it as 'a service in the field of transport' rather than 'an information society service' (EU:C:2017:981). Consequently, Uber was prevented from freely establishing its UberPOP service in the EU.

The ECJ judgment came after the Advocate General's Opinion, according to which Uber offers a mixed service, both physical and digital. Since Uber was also deemed to exert a relevant amount of control over the physical part of its service (setting the maximum price of a ride, establishing vehicles quality requisites, vetting prospective drivers), the company could not be qualified as a simple digital intermediary.

The Uber case clearly shows that intermediation vs. active role in service provision is the core issue of the ongoing debate on the exact nature of platforms. However, technology has blurred the distinction between these two general categories, generating uncertainty regarding how to correctly classify these new economic players and which regulatory regime should apply.

Regulation overhauling

Where should regulators start from when approaching platforms? Platforms are, in a way, self-regulated and self-policed (McKee 2017): they impede or allow users to transact according to internal and self-established rules. Since protecting the interests of the contracting parties is also an interest of the host platform, incentives are aligned, steering towards self-regulation. Therefore, the question, from a public policy perspective, is whether these internal rules are aligned with the public interest, particularly with consumer protection and competition policy.

Public welfare perspective puts consumers at the centre: consumer interest is not only about prices, but also about quality, variety and innovation. Innovations that enrich

consumers' possibility of choice should be fostered and accompanied by public regulation.

Market failures are the theoretical ground for public regulation of markets: market power, information problems, accessibility and fairness, public goods and externalities account for a large proportion of such failures. From this perspective, regulators should consider that technology shakes the borders of market failures and sometimes erases them, as in the case of information asymmetries reduced by the availability of public reviews on the web. This concretely implies that if the peer review system is able to guarantee the quality of the service provided through a platform, it will not be necessary to set new standards applying to that service.

As shown by the ECJ decision on Uber, regulation – particularly at the European level – has paid more attention to the physical dimension of platform-based services than to the ability of platforms to reduce transaction costs, and thus create value by means of digital tools. In other words, regulation has preferred to focus on objects instead of needs. However, such regulation of objects, coupled with licensing systems that limit the scope and size of markets, have advantaged incumbent players like taxi drivers. This creates the risk of banning platforms' business models without giving adequate consideration to consumer protection issues.

Policy options

As some scholars have argued (Biber *et al.* 2017), the disruptive effect coming from platforms business models is mainly a matter of policy rather than markets. According to these scholars, a key concept is *policy disruption*, which Biber *et al.* (2017) said is due to 'a *business innovation* threatening an *incumbent industry* in such a way as to create a *policy problem* that the *existing regulatory regime* does not effectively manage'.

Regulators can choose among four different policy strategies when it comes to making decisions about the regulation of an industry affected by policy disruption:

• Block (which implies the exclusion of outsiders from entering the market and competing with incumbents)

• Free Pass (which not only gives outsiders the possibility to compete, but also exempts them from the existing regulation)

• OldReg (extending the current legal framework to outsiders)

• NewReg (allowing outsiders to compete under a new regulatory framework that encompasses both outsiders and incumbents) (Biber *et al.* 2017).

Before coming to a decision, regulators should assess whether the existing regulatory regime can be considered organisationally neutral. Regulatory neutrality should be the default principle that allows both incumbents and outsiders (potential competitors) to be subject to the same set of rules.

However, it can be held that there are some public policy concerns that outweigh neutrality principle. For example, Airbnb could be given a FreePass since it has been found that its activity creates welfare gains for consumers, especially in those times and places where hotels are capacity-constrained and therefore more prone to raise prices (Farronato and Fradkin 2018).

On the contrary, it could be noted that these new players create other major policy concerns that justify the adoption of a new regime, sometimes with severe implications for platforms operations. For example, new zoning policies or caps could be necessary to limit Airbnb's expansion at the urban level, since it has been found that an increase in Airbnb supply is associated with an increase in long-term rent and house prices, with negative effects for consumers of the traditional housing market (Barron *et al.* 2018).

These examples show that there is no single unique and prescriptive answer in the type of situations we are considering. We are talking about complex phenomena that should be monitored in order to understand their impacts and develop appropriate regulatory frameworks. Banning the entry of newcomers is only one extreme solution from a long menu of tools to effectively manage the rise of platforms.

Labour and platforms

Platforms also disrupt the traditional divide between employees and independent contractors. Considering themselves as pure middlemen that do not exert employers' traditional prerogatives, platforms aim to transfer a big chunk of the market risk to service providers (platform workers) in order to avoid paying the costs associated with those risks (illness, accidents and injuries, working time fluctuations).

Platform workers have frequently tried to draw on judicial decisions in order to solve problems relating to their working condition. Collective bargaining is another institutional tool that could effectively manage the conflict arising in the sphere of the so-called digital labour. Collective bargaining 'can stabilise labour markets and equalise bargaining power' between capital and labour, with the final result of 'taking wages out of competition' (Kaufman 2003). This issue is particularly important in the case of platforms, since platform workers often suffer from an ev-

ident weak position in terms of market power, which leads to put downward pressure on the overall level of workers' remuneration.

Giving platform workers the right to collectively bargain regarding their remuneration and working conditions could counteract the existing unbalance in market power, and induce platforms to reach a new level of maturity and compete on variables – such as innovation and qualitative improvement of the service – other than wage bills.

Data and regulation

The main finding from the development of markets and products relying on advanced forms of technological tools such as artificial intelligence and machine learning is the central role played by data in shaping the trajectories of expansion of old and new economies.

When talking about data in the context of the platform economy, the main question from an economic and regulatory perspective is: is the exchange of personal data for platforms services fair?

According to some scholars (Sokol and Comerford 2016), regulators should consider data collection and processing mainly as a source of potential harm to consumers privacy, rather than a pure antitrust and competition issue. From this view, the fact that huge masses of data are concentrated in the hands of few economic operators with powerful dominant or monopolistic positions in the market is not necessarily a reason for concern: 'mere possession of data alone therefore, even in large volume, does not secure competitive success – that can only be achieved through engineering talent, quality of service, speed of innovation, and attention to consumer needs' (Sokol and Comerford 2016).

A radically different school of thought contends that big data are also a potential source of harm to consumers on competitive and welfare grounds. According to one antitrust expert, Amazon – by exploiting the possibility of monitoring and observing its customers' online behaviour – 'is also able to tailor prices to individual consumers' (Khan 2017). This would change 'prices more than 2.5 million times each day' through 'constant price fluctuations', which would 'diminish our ability to discern pricing trends' (Khan 2017). Such practices have the potential to extract the highest possible value from consumers' preferences, according to a mechanism that the economic theory labels as 'first-degree price discrimination' (Khan 2017). In this view, big data are considered to be part of a family of tools used to become more and more dominant and maximise earnings.

The General Data Protection Regulation (GDPR) – the latest regulatory tool concerning data collection and processing issued at the European Union level – seems to merge and reconcile these two different approaches, using consumers' privacy protection as leverage to encourage competition in the digital environment. Article 20 of the GDPR defines users' right to data portability, in the hope of reducing barriers to entry for new players in markets largely dominated by few operators. However, this right does not apply when personal data is being processed on the basis of a 'legitimate interest' of the service provider, leaving the problems of data ownership and data management without a clear solution.

What seems necessary is the development of a more coherent legislative and regulatory framework. This would reduce the existing degree of uncertainty regarding the economic and legal nature of data and would better define the incentives of the different actors involved in the platform economy and, more generally, the digital economy.

Conclusions and regulatory agenda

It is possible to identify three main points that remain unresolved and shape the regulatory agenda for the near future.

• How to cope with the appearance of platforms potentially disrupting pre-existing markets. Rather than trying to block the development of new, digital-based business models because of their disruptive impact on old industries, policymakers should elaborate adaptive regulatory frameworks, keeping in mind that banning the entry of a newcomer is an extreme decision.

• How to address the problems relating to platform workers. Giving workers the right to negotiate with platforms to reach collective agreements could help reduce the existing unbalance of power between capital and labour, thus pushing towards a competition based on the quality of services instead of wages or workers' remuneration.

• Who has the right of ownership over the data generated in the digital realm? The GDPR has tried to solve this issue, but it seems that further updates are required to better define the incentives of all the actors involved in the platform and digital economies.

References

Akerlof, G. A. (2003), 'Writing the "The Market for 'Lemons'": A Personal and Interpretive Essay', from https://www.nobelprize.org/prizes/economic-sciences/2001/akerlof/biographical/, accessed 9 July 2019.

Barron, K., Kung, E., and Proserpio, D. (2018), 'The Effect of Home-Sharing on House Prices and Rents: Evidence from Airbnb'. Available at SSRN: http://ssrn.com/abstract=3006832 or http://dx.doi.org/10.2139/ssrn.3006832

Biber, E., Light, S. E., Ruhl, J. B., and Salzman, J. (2017), 'Regulating Business Innovation as Policy Disruption: From the Model T to Airbnb', *70 Vanderbilt Law Review 1561.*

Botsman, R., and Rogers, R., eds. (2010), *What's Mine Is Yours: The Rise of Collaborative Consumption* (New York: HarperBusiness).

COEURE, Cooperation on European Research in Economics (2015), 'The workshop on competition and regulation in markets for goods and services', <http://www.coeure.eu/wp-content/uploads/competition-and-regulation-in-markets-for-goods-and-services.pdf>, accessed 9 July 2019.

Farronato, C., and Fradkin, A. (2018), 'The Welfare Effects of Peer Entry in the Accommodation Market: The Case of Airbnb', *NBER Working Paper No. 24361.*

Kaufman, B. E. (2003), 'John R. Commons and the Wisconsin School on Industrial Relations Strategy and Policy', *Industrial and Labor Relations Review*, 57 (1): 3–30.

Khan, L. M. (2017), 'Amazon's Antitrust Paradox', *Yale Law Journal*, 126 (3): 710–805.

McKee, D. (2017), 'The platform economy: natural, neutral, consensual and efficient?', *Transnational Legal Theory*, 8 (4): 455–495.

Sokol, D. D., and Comerford, R. S. (2016), 'Antitrust and Regulating Big Data', *23 George Mason Law Review, 1129.*

Network Economics of Operator Platforms[1]

Günter Knieps*

Disruption of traditional network industries and the emergence of operator platforms for intelligent networks provide challenging governance problems of contractual relationships among the actors involved. This chapter analyses the problem of division of labour among all-IP broadband network providers, virtual network service providers and platform operators concomitant with the implementation of adequate governance structures.

Smart networks and the evolution of operator platforms

Innovations in information and communication technologies (ICTs) have become an important engine for the strongly growing interdisciplinary research on multi-sided platforms and markets (Sanchez-Cartas, Leon, 2019). Online intermediation services encompassing online e-commerce market places, online software application stores as well as online social media are gaining increasing attention within the European Community. In this context, the goal of competition between content providers on one side and access to content by consumers on the other side have shifted the focus towards the guarantee of non-discriminatory treatment of services operating on top of online platforms (Krämer, Schnurr, de Streel, 2017). EU rules on competition, consumer protection, transparency obligations, and so on have focused strongly on online platform-based services for content industries.[2] Online intermediation services organised via online trading platforms play an intermediary function for online exchange of goods, services or information between sellers and consumers, typically without changing the items or information exchanged (Nielsen, Basalisco, Thelle, 2013, p. 7). Online platforms often emphasise their passive role of transmitting information without editorial input, indicating the requirements of platform neutrality. Nevertheless, the responsibilities and obligations of online platforms to play a more active role in managing content (such as banning 'abusive behaviour') are currently under debate (Chander, Krishnamurthy 2018).

The Internet of Things (IoT) poses disruptive challenges for conventional network industries, enabling IoT applications for physical network services based on real time, adaptive and location-sensitive data. Digitalisation in markets for network services is fundamentally disrupting conventional network industries; in the meantime, platform-based services are becoming increasingly relevant in network industries (Montero, Finger, 2017). There is an open and ever-expanding set of physical IoT applications requiring operator platforms in their role as coordinators, aggregators and organisers of smart physical network services. Operator platforms play an active role in the creation of new innovative markets for physical network services. The focus of the present paper is on the governance of operator platforms driven by the requirements of IoT applications and the future role of entrepreneurial decision-making within operator platforms. New challenges and requirements for a variety of heterogeneous operator platforms have arisen, combining the requirements of physical IoT applications with complementary virtual networks. This enables interactive machine-to-machine communication combined with complementary dimensions such as geo-location, sensors and (big) data processing. Heterogeneous virtual networks that are complementary for various IoT application services are based on sensor networks, quality of service (QoS) requirements of all-IP broadband networks, geo-locational awareness and big data collection and processing within local neighbourhoods (Knieps, 2017a).

Prosumer peer-to-peer activities, as well as business-oriented market activities, are organised via a variety of operator platforms in order to organise innovative markets for network services.

Mobility as a service platform

Mobility as a service platform can be organised for physical intermodal transportation services from different providers (buses, trains, etc.). Blurring boundaries arise between

[1] Helpful comments by the participants of the 8th Florence Conference on the Regulation of Infrastructures, in particular by Matthias Finger and Juan José Montero are gratefully acknowledged.

[2] European Commission, Proposal for a Regulation of the European Parliament and of the Council on promoting fairness and transparency for business users of online intermediation services, Brussels, 26.4. 2018, COM (2018) 238 final. In February 2019 the European Parliament and the Council reached an agreement on the proposed regulation (EPRS Briefing EU Legislation in Progress, April 2019) <https://epthinktank.eu/eu-legislation-in-progress/>.

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shared bus-on-demand services with flexible time scheduling and routing and public transit with scheduled services. Complementary to the changing markets for physical transportation services, heterogeneous virtual networks for shared mobility services evolve based on a combination of mobile real-time communication, global geopositioning services and sensor-based data processing. App-based operator platforms are coordinating and organising the on-demand provision of mobility services, which has resulted in the convergence of markets for taxis, private-hire vehicles and ride-sourcing services (Knieps, 2018).

Networked driverless vehicle platforms

Networked driverless vehicle platforms organise highly interactive networked driverless vehicle services with the support of high-volume location-critical big data processing (edge cloud), where the function of driver responsibility is shifted to the platform operator for the transportation process. Operator platforms require big data virtual networks which combine the highest QoS class in all-IP broadband networks with locally based data collection and data processing and edge cloud computation (Knieps, 2019, pp. 175–179).

Microgrid platforms

Microgrid platform operators organise the low-voltage generation and consumption of electricity with a focus on renewable energy. Within (low-voltage) microgrid platforms, the generation, storage and consumption of electricity of different home appliances are aggregated into the loads of prosumer units, irrespective of its location within the microgrid platform. The resulting surplus or deficit results in outside requirements of import or the exporting of electricity to other (neighbouring) microgrids or distribution networks. Complementary to the physical microgrid platforms are virtual networks that provide the ICT logistics of microgrids. Low-latency requirements of data packet transmission within home networks are based on QoS differentiated all-IP broadband networks (Knieps, 2017b).

The governance of heterogeneous operator platforms

The disruption of conventional network industries and the emergence of innovative physical operator platforms provide challenging governance problems of contractual relationships among the various actors involved. The question regarding proper governance arises focusing on the role of spot market transactions versus long-run contractual relationships as well as idiosyncratic relationships. The problem solution competence of operator platforms (two-sided, multi-sided) is the entrepreneurial search for the required governance structures. Operator platforms need, as input, a combination of physical networks and network services with complementary (big data) virtual networks. The problem of division of labour among all-IP broadband network providers, virtual network service providers, and platform operators arises concomitant with the implementation of adequate governance structures.

Heterogeneous specialised providers of operator platforms fulfil the role of coordinators, aggregators and organisers, resulting in shared mobility platform operators, networked vehicle platform operators, microgrid platform operators, etc. Organisational competence to combine physical network services with required virtual networks may be bundled in the hand of the platform operators to enable an entrepreneurial combination of the different dimensions of virtual networks within the virtual network required for the smart physical network services. The governance problems of operator platforms are manifold, with different contractual relations between different actors.

Governance between all-IP network providers and virtual network providers

Contractual relations between (application-blind) multipurpose all-IP networks and (application-aware) virtual networks for operator platforms can be based on market transactions and competitive market prices. A hierarchy of stochastic and deterministic traffic classes is required to fulfil the various QoS requirements of different virtual network operators (Knieps 2017a).

Governance between platform operators and virtual network providers

Of particular relevance for the governance of operator platforms is the contractual relationship to virtual network providers. Such a contractual relation may vary in the degree of complexity from market transaction to long-term contracts and possible incentives for vertical integration. Whereas the applications of mobility apps in shared mobility markets can be implemented via short-term spot markets, real-time adaptive organisation of import/export of electricity within microgrids may be best carried out via long-term contracts. Incentive for vertical integration between (physical) platform operators and virtual network providers may arise within networked driverless vehicle platforms due to a strong idiosyncratic kind of unverifiable knowledge problems between physical and virtual services.

Governance between platform operator and participants of the platform

Contractual relations between platform operators and participants of the platform (producers, prosumers, con-

sumers) may vary depending on the design and requirements of heterogeneous operator platforms. Ride-sourcing platforms may only provide the organisational platform such that individual car rides are matched with the needs of passengers, without owning the vehicles. Alternatively, a shared mobility platform can also own a fleet of vehicles (such as minibuses) that they own and operate in a centrally dispatched transportation mode. The interaction between users of operator platforms and platform operator may require related admission procedures, obligations to provide sensor-based metering data for billing procedure, shared user data for aggregator/operator activities, as well as liability rules for the insurance purposes of platform operators. Platform user conditions may also vary in their specifications of obligations regarding metering information and sensor equipment within home networks, black box equipment for car security or IoT application equipment, insurance, health conditions, etc.

Governance between platform operators and physical network infrastructure providers

Contractual relations between platform operator and physical infrastructure providers are driven by the requirements of intermodal market transactions of network access with choice of intermodal combination of shared mobility services, etc. Access of platform operators to physical network infrastructure capacities (such as airport slots, track capacities) may be organised by spot markets or long-term contracts. Since the interoperability between network service provision and infrastructure can be guaranteed by adequate standards, the necessities for vertical integration to internalise idiosyncratic knowledge problems do not hold. Nevertheless, platform operators require non-discriminatory access to the underlying physical network infrastructures.

Is there a need for market power regulation of operator platforms?

Competition law and antitrust policy should not only be applied in liberalised network service markets and the evolving markets for online intermediation services platforms, but also in the new evolving operator platform markets. It is to be expected that operator platforms will not require a new paradigm of ex ante market power regulation. Although direct and indirect network externalities, as well as the potentials of economies of scale, are significant for operator platforms, they are, by their very nature, network service markets with many faces of active and potential competition. In contrast, physical network infrastructures may have the characteristics of a monopolistic bottleneck due to the absence of active and potential competition, and thereby possess network-specific market power. Sector-specific price-level regulation of access tariffs and accounting separation is required to guarantee non-discriminatory access to monopolistic bottlenecks (Knieps, Bauer, 2016, pp. 45–48).

Undisturbed competition on the markets for network services can only evolve if platform operators and conventional physical network service providers gain access to complementary physical network infrastructures at non-discriminatory access charges. As it turns out, intramodal regulation of monopolistic bottleneck infrastructures is a precondition for undisturbed intermodal platform competition, which should be enabled by access regulation to monopolistic bottleneck infrastructures. If a platform operator also owns an (upstream) monopolistic bottleneck infrastructure, disaggregated market power regulation should also be applied, focusing on the monopolistic bottleneck components.

Platform-based security and privacy requirements

Regulatory problems on the physical side of operator platforms, such as liability and safety of the physical network services, are to be differentiated from privacy and security issues within virtual networks. For example, within the physical side of transportation service markets, technical regulations for vehicle safety and social security are unavoidable. An increasing need for technical regulations, such as specifications of safety and liability regulations in shared mobility, ride-sourcing and networked driverless vehicles applications, can be identified (Fagnant, Kockelman 2015).

There are many challenges regarding security and privacy in the IoT (Maple, 2017). Security and privacy requirements vary widely depending on the specific virtual network required for a specific operator platform. Complementary regulations for security and compatibility reasons, as well as privacy and cybersecurity regulations, become necessary to fulfil the requirements of the physical and virtual sides of operator platforms. Heterogeneous requirements arise for specifications of rules and regulations in different operator platforms on the physical side as well as the virtual side, depending on the details of home networks, shared mobility, networked driverless vehicles, etc.

References

Chander, A., Krishnamurthy, V. (2018), The myth of platform neutrality, Georgetown Law Technology Review, 2(2), 400–416.

Fagnant, D.J., Kockelman, K. (2015), Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations, Transportation Research Part A, 77, 167–181.

Knieps, G. (2017a), Internet of Things, future networks and the economics of virtual networks, Competition and Regulation in Network Industries, 18, 240–255.

Knieps, G. (2017b), Internet of Things and the Economics of Microgrids, in: F. Sioshansi (Ed.), Innovation and Disruption at the Grid's Edge, Academic Press/Elsevier, Amsterdam et al., 241–258

Knieps, G. (2018), Network Economics of Shared Mobility, Network Industries Quarterly, 20(3), 9–12.

Knieps, G. (2019). Internet of Things, big data and the economics of networked vehicles, Telecommunications Policy, 43(2), 171–181.

Knieps, G., Bauer, J.M. (2016), The industrial organization of the Internet, in: J.M. Bauer, M. Latzer (Eds.): Handbook on the Economics of the Internet, Edward Elgar, Cheltenham et al., 23–54.

Krämer, J., Schnurr, D., de Streel, A. (2017), Internet Platforms and Non-Discrimination, Centre on Regulation in Europe, , https://www.cerre.eu/publications/internet-platforms-non-discrimination, accessed 5 December 2017

Maple, C. (2017), Security and privacy in the internet of things, Journal of Cyberpolicy, 2(2), 155–184.

Montero, J.J., Finger, M., (2017), Platformed! Network industries and the new digital paradigm, Competition and Regulation in Network Industries, 18, 217–239.

Nielsen, K.E., Basalisco, B., Thelle, M.H. (2013), The impact of online intermediaries on the EU economy, Copenhagen Economics, https://www.copenhageneconomics.com/.../the-impact-of-online, accessed 3 September 2019

Sanchez-Cartas, J.M., Leon, G., (2019), Multi-sided Platforms and Markets: A Literature Review, https://www.researchgate.net/profile/Juan_Manuel_Sanchez-Cartas/publication/325225786, accessed 3 September 2019

Mandating Data Sharing to Establish Data as an Infrastructural Resource

Charlotte Ducuing*

In 2015, the OECD proposed characterising 'most data' as an 'infrastructural resource' and accordingly laid down guidelines in favour of various degrees of 'openness' of data. Several (contemplated) data-sharing legal regimes appear to essentially recognise and regulate data as an infrastructure, albeit without making explicit reference to this notion. The present article discusses this phenomenon through a study of three such cases, namely the Open Data and PSI Directive, the on-going institutional discussion on the governance of in-vehicle data, and the freshly adopted regulation of data in the Electricity Directive.

1. Sharing data as a purposive infrastructure in the Open Data and PSI Directive

The Directive (EU) 2019/1024 on open data and the re-use of public sector information ('the Open Data and PSI Directive') adopted in 2019 recasts Directive (EU) 2003/98 on public sector information and further expands the principle of re-use of information (otherwise called 'documents' or 'data') held by a large range of public authorities. The Open Data and PSI Directive mainly lays down a principle of *mandatory making available* of information falling onto 'public sector bodies' for re-use (and to a lesser extent to some other regulated entities), for both commercial and non-commercial purposes by third parties (Article 3 (1)), following the objective of 'open data' (Article 1 (1)). The mandatory making available of data for re-use – or 'PSI regime' – is based on the observation that documents produced by public bodies constitute 'a vast, diverse and valuable pool of resources that can benefit society' (recital 8).

Lundqvist considered that competition law and especially '[the essential facility doctrine] has [hereby] been a great source of inspiration […]' (Lundqvist 2018). As part of competition law, the essential facility doctrine requires, on behalf of the dominant undertaking, an unjustified refusal to supply or give access to a 'facility' that would be 'essential' for the applicant to operate its activity on a derived market, on which the refusal may eliminate competition (the determination of the harm within the meaning of Article 102 TFEU). Additionally, where the 'facility' is protected by intellectual property rights, the refusal would prevent the emergence of a new product or service for which there is potential demand of consumers; in other words, of an innovation. The essential facility remedy consists of imposing on the facility-holder (in other words, the undertaking abusing its dominant position) an obligation to supply under 'FRAND' (fair, reasonable and non-discriminatory) conditions, to the benefit of the applicant.

The PSI regime obviously departs from competition law in that it operates *ex ante,* namely *before* – and *without* – *any harm* being caused to an applicant. The essential facility 'logic' may yet be recognised with regard to the identification of the regulated entities, which are regulated in their quality as unique creators of data produced in the course of their public tasks of services of general interest; namely, in a '*monopolist' way.* As observed by Lundqvist, the prohibition of exclusive arrangements (Chapter IV of the Directive) also evidences the competition law inspiration of the PSI regime. In that sense, the PSI regime introduces the regulated entities as actors in the data economy value chain by turning them into providers of 'raw' data. The Open Data and PSI Directive goes far in this regard. Although the Directive applies only to *re-use* and in principle not *the production and original use* of the data, it lays down the obligation for Member States to 'encourage public sector bodies and public undertakings to produce and make available documents […] in accordance with the principle of 'open by design and by default" (Article 5 (2)) namely introducing the 'taste' of re-use as from the earliest stages of the production and first use of the data.

However, a major distinction with the essential facility doctrine regards the *beneficiaries* of the PSI regime and the *rationale* for their identification. The PSI regime applies to the benefit of *all third parties*, for both commercial and non-commercial purposes. For the beneficiaries, there is not even a requirement to *have* a pre-identified purpose. The PSI regime is precisely grounded in the expectation that third parties will 'find *new ways* to use [the data] and create new, innovative products and services' (recital 8). Data are expected to 'contribute to […] the development of new applications for consumers and legal entities [and especially with] intelligent data use, including their processing through artificial intelligence applications […]' (recital 9). In this context, another source of inspiration can be identified; namely, the identification of information or data held by the regulated entities as an infrastructure.

Infrastructure has been generally described as the 'underlying framework of a system' or 'shared means to many ends' (Frischmann 2012). Frischmann identified three

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characteristics of infrastructure. Functionally, infrastructure is a resource that is used 'as input into a wide range of goods and services, which many include private […], public […] and social goods', otherwise referred to as the 'general purpose-criterion'. Secondly, the consumption of infrastructure is non-rivalrous to some appreciable extent. Thirdly, the 'social demand for the resource for the resource is driven primarily by downstream productive activities that require the resource as input'. Core to the concept of infrastructure is the differentiation between two levels: the infrastructure level and the 'downstream product of other goods'. However, the 'downstream' level should not be viewed as a bounded market. Rather, infrastructure is 'used by many different users, with the usage evolving over time, as may the type of users' (Janssen et al. 2009).

The PSI regime is demonstrably based on the 'general-purpose' feature of data. No *specific* dataset is targeted (except for the new chapter V 'high-value datasets') and the re-use is not limited to a specific sector or market. On the contrary, the expectation that data held by public bodies will feed artificial intelligence applications indicates how broadly data are envisaged to be reusable for. In other words, there may potentially be many *'downstream levels'*, which may and/or may not be markets in the economic sense. Against this background, the Open Data and PSI Directive can be described as *purposive*. Data are regulated as infrastructure, based on their *potential* to be used as such in the data economy. The (mandatory) making available for re-use is precisely expected to turn data into an infrastructural resource. This can be generally opposed to a *defensive* regulation as infrastructure, where the resource recognised as such would *already functionally qualify as infrastructure*. In such a case, regulation would aim to *defend* the interests of third parties active in the downstream level, reliant on the infrastructural resource (such as with net neutrality regulation). The Open Data and PSI Directive is based on a purposive view of infrastructure, in that data held by regulated entities are expected to play a role as infrastructure for *yet-to-be-created* downstream activities; in other words, to boost innovation.

2. Data sharing to promote 'fair competition for data' in the automotive industry?

A data-sharing regime based partly on the 'general purpose criterion' of data may also be imposed on *private undertakings*, such as vehicle manufacturers. Because road vehicles have become increasingly connected devices, 'in-vehicle data', mostly held by vehicle manufacturers, have caught the eye of many businesses. Regulation 715/2007 already makes it mandatory (Article 6 (1)) for vehicle manufacturers to provide 'unrestricted and standardised access to vehicle repair and maintenance information to independent operators'. The Commission has contemplated further data sharing in its Communication of 2017 'Building a European Data Economy' and its accompanying Staff Working Document and then in its Communication of 2008 'On the Road to Automated Mobility'. In the latter document, the Commission considered that in-vehicle data 'have an enormous potential to create new and personalised services and products, revolutionise existing business models (e.g. roadside assistance, vehicle insurance, vehicle repair, car rental, etc.) or lead to the development of new ones. Different economic actors are competing for such data.' The Commission also noted that there is a risk of 'centralisation of in-vehicle data by vehicle manufacturers', which 'might in itself not be sufficient to ensure fair and undistorted competition between service providers […] in the digital single market'. The Commission 'intends to improve access and reuse of mobility and vehicle data for commercial and non-commercial purposes'. Contrary to the TRAN report on C-ITS, which called for a legislative proposal, the Commission only envisages a non-binding recommendation at that stage. Both refer to the *competition for such data,* and the TRAN report of the European Parliament further refers to the purpose of promoting 'fair, non-discriminatory competition on this market […]'. Similar to the PSI regime, the trigger for contemplating data sharing (obligation) seems to be the identification of a parallel 'data market' in addition to the market for vehicles, where the data holder – the vehicle manufacturer in the present case – would be a 'monopolist'.

In his economic analysis of the governance of in-vehicle data, Kerber further distinguished between two situations. On the one hand, vehicle manufacturers are in a position to reserve 'an exclusive ("monopolisitic") control of in-vehicle data', to the detriment of 'independent providers of services *within the ecosystem* of connected and automated mobility' (Kerber 2018). This could enable the vehicle manufacturer to 'control the automotive aftermarkets and adjacent services leading to less competition […]'. On the other hand, Kerber underlined that many further stakeholders have a legitimate interest in getting access to the data, 'for new innovative services'.

This distinction again appears to confirm the existence of distinct sources of inspiration for potential in-vehicle data sharing regime. First, data sharing would be a means of preventing harm being caused by vehicle manufacturers to operators active in the same or related markets, based on their monopolist access and use of data. Competition law,

especially the essential facility doctrine therein, appears to be a source of inspiration. By aiming to *prevent certain harm* from being caused to competition in these markets (*ex ante* approach), similarities can also be identified with sector-specific regulation adopted in liberalised markets in network industries. Second, a consideration of data as purposive infrastructure can again be identified.

However, these sources of inspiration are not explicitly recognised in either the Communication of the Commission or the TRAN report on C-ITS. They even seem to be confused behind a rather vague call for 'fair competition for data'.

3. Regulation of the data layer in the electricity sector

In 2016, the Commission proposed a directive on the internal market in electricity and the Electricity Directive was adopted in 2019. The Directive includes a harmonised legal framework for 'data management' and the access to such data. For the purpose of the Directive, data means 'data of the final customer' and 'include[s] metering and consumption data as well as data required for customer switching, demand response *and other services*' (emphasis added) (Article 23 (1)), while it remains unclear what 'other services' are. While metering data are not defined, 'meters' include both smart meters and conventional meters (Articles 19 to 22). The proposal from the Commission suggested harmonising the determination of the 'eligible parties', namely the beneficiaries of the legal regime. Member States would have to specify a list of eligible parties that would at least include 'customers, suppliers, transmission and distribution system operators, aggregators, energy service companies, *and other parties which provide energy or other services to customers*' (emphasis added). The text of the Directive as adopted did not retain this provision, while it does continue to refer to 'eligible parties' (see Articles 23, 24 and 34). Thus, the room for manoeuvre among Member States in transposing this provision remains unclear. The Member States shall 'organise the management of data in order to ensure efficient data access and exchange'. Access to data shall be granted in a 'non-discriminatory' manner amongst the 'eligible parties'. It shall be 'easy and the relevant procedures for obtaining access to data shall be made publicly available' (Article 23 (2)). With a view to interoperability, the Commission shall adopt, 'by means of implementing acts, interoperability requirements and non-discriminatory and transparent procedures for access to data' (Article 24 (2)). The price for accessing data shall be regulated by Member States, but shall in any case be 'reasonable and duly justified' (Article 23 (5)).

The Directive also lays down requirements applying to the data management *operator*. The impact assessment of the Commission identified more or less stringent options, with the most ambitious one defining a 'specific EU data management model for all Member States, such as an independent central data hub', with the purpose being to 'ensure the impartiality of market actors involved in data handling' and to 'creat[e] a *level playing field for access to data*' (emphasis added). The Directive did not retain this option and leaves the design of the 'data management model' up to the Member States, while the 'impartiality' of the regulated entity is identified as a regulatory objective (recital 57). However, as an enforcement tool to ensure 'that they comply with the[ir legal] requirements', the Directive lays down the obligation for Member States to have the 'parties responsible for the data management' either supervised by competent authority or 'authorise[d] and certify[ied]' (Article 23 (4)).

Additionally, where vertically integrated 'distribution system operators (DSO) are involved in data management' *and* where *smart* meters are implemented, more stringent requirements apply, copied from the independence requirements applying with regard to the electricity distribution function (Article 34). DSOs that are already part of a vertically integrated undertaking must set up a 'compliance program' as part of and with a view to ensuring their independence. The 'compliance program' of the DSO sets out 'measures taken to ensure that discriminatory conduct is excluded, and that observance of it is adequately monitored'. It includes 'specific obligations of employees to meet that objective'. The measures taken, in the form of an annual report, shall be submitted to the regulatory authority and published. It shall also be submitted to the internal but independent 'compliance officer' of the DSO (Article 35 (2 (d)). The Directive essentially *extends the scope* of the compliance program of vertically integrated DSOs *to data management*. Therefore, the compliance program shall include 'specific measures in order to exclude discriminatory access to data […]' (Article 34). Finally, the regulatory authority is granted the new competence to supervise that eligible parties have genuine access to data, under the conditions provided by the Directive (Article 59 (1) (t)). Strangely, 'data management' is not defined in the Directive, although it is referred to in many provisions. The impact assessment of the Commission defined 'data management' as 'the processes by which data is sourced, validated, stored, protected and processed and by which it can be accessed by suppliers or customers'.

Here again, the legal regime is obviously inspired by several sources, including by competition law and the essential facility doctrine. Data management operators are targeted as 'data monopolists', in the sense that they have a monopolist access to certain data sources (such as data produced

by the meters). More precisely, the regulation of the data layer is manifestly inspired from *ex ante* specific regulation in the liberalised electricity sector, as evidenced, *inter alia,* by the inclusion, in the list of minimum 'eligible parties' proposed by the Commission, of operators already active in the sector (such as 'suppliers, transmission and distribution system operators, aggregators'), although eventually not retained in the Directive. This is also confirmed by the concern that the data management operator – especially when being a vertically integrated DSO – could take advantage of being the exclusive holder of such data, for the conduct of his/her own business. The focus is also importantly placed on the potential of *smart metering data* to provide (near) real-time information and to make the market more 'contestable' (see *inter alia* articles 15 (2) (d), 17 and 20). The final customers are therein called upon to play a role, which is a constant concern in liberalised network industries with large remaining incumbent providers. Finally, the regulatory focus on the *impartiality* of the data management operator and the extension of the legal regime applying to vertically integrated DSOs to the data management layer as functional *preventive measures* are openly adopted by analogy to the regulation of incumbent electricity players. Structural regulatory options were contemplated in the Impact Assessment of the Commission, although they were eventually not retained. On the other hand, the regulation of the data layer is also expected to play a role in the development of innovative products and services, again especially thanks to smart metering data (see recital 55 and Article 19 and 20). The impact assessment of the Commission interestingly evaluated regulatory options for data management with regard to both objectives to 'facilitat[e] competition' and to 'support[…] new services'. In that sense, the regulation of electricity data is again based on them being perceived as a purposive infrastructure, albeit subject to national transposition, *inter alia* with regard to the determination of 'eligible parties'.

Similar to what was observed with regard to in-vehicle data, the various sources of inspiration for data sharing obligations (and more broadly for the regulation of the data layer) are not explicitly recognised. Again, they seem to be confused, as exemplified by the call from the Commission for a vague 'level playing field for access to data', similar to the 'fair competition for data' argument in the field of in-vehicle data. Eventually, the distinction between the various rationales appears to have not been considered relevant, as evidenced for instance by the 'open list' of eligible parties proposed by the Commission and to the fact that, ultimately, all 'eligible parties' would have to be treated equally. This will probably lead to some uncertainty in the transposition process.

4. Conclusion

The sources of inspiration for the regulation of data in the Open Data and PSI Directive and in the Electricity Directive were analysed, and the same analysis was also conducted with regard to the arguments put to the fore by EU institutions concerning the governance of in-vehicle data. This shows a growing willingness to impose data sharing obligations based on the consideration of data as a purposive infrastructure – or, in other words, to foster innovation. However, this rationale is not openly recognised, and has even been confused with other market regulation rationales behind vague calls for 'fair competition' or a 'level playing field' of data. I submit that more clarity and granularity are needed when imposing data sharing obligations, with a view to the fairness required in balancing the legitimate interests at stake and especially these of the data holders.

References

Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L 158/125 (the Electricity Directive).

Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ L 172/56 (the Open Data and PSI Directive).

European Commission, Commission Staff Working Document Impact Assessment Accompanying the document Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast) […], SWD/2016/0410 final – 2016/0379 (COD).

European Commission, Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Building a European Data Economy', 10.1.2017, COM(2017) 9 final (Communication Building a European Data Economy).

European Commission, Commission Staff Working Document On the Free Flow of Data and Emerging Issues of the European Data Economy, Accompanying the Communication […], (SWD/2017/02 final) (Commission Staff Working Document).

European Commission, Communication to the European Parliament, the Council, The European Economic and Social Committee, the Committee of the Regions, On the road to automated mobility: an EU strategy for mobility of the future, COM/2018/283 final (Communication On the Road to Automated Mobility).

European Parliament, Committee on Transport and Tourism (TRAN), Report of 23.2.2018 on a European Strategy on Cooperative Intelligent Transport Systems (2017/2067(INI)) (TRAN report on C-ITS).

Regulation (EC) N° 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, OJ L 171/1 ('Regulation 715/2007').

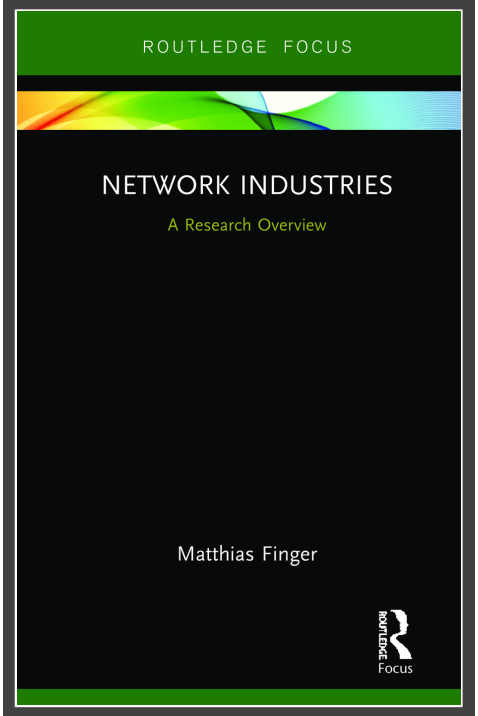
Frischmann, B. (2012), *Infrastructure: The Social Value of Shared Resources* (Oxford University Press).

Kerber, W. (2018), 'Data Governance in Connected Cars: The Problem of Access to In-Vehicle Data', *JIPITEC* 9 (3), 309–338.

Janssen, M., Chun, S.A., and Gil-Garcia, J.R. (2009) 'Building the next Generation of Digital Government Infrastructures', *Government Information Quarterly*, 26 (2), 233–237.

Lundqvist, B. (2018), 'Big Data, Open Data, Privacy Regulations, Intellectual Property and Competition Law in an Internet-of-Things World: The Issue of Accessing Data', in Mor Bakhoum and others (eds), *Personal Data in Competition, Consumer Protection and Intellectual Property Law: Towards a Holistic Approach?* (Springer Berlin Heidelberg), 191–214.

OECD, Data-driven Innovation – Big data for growth and well-being (OECD 2015).



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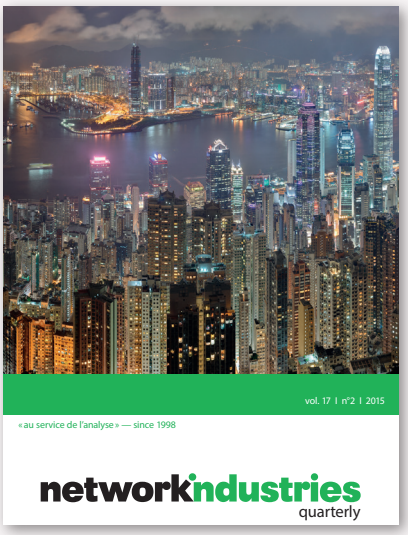

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