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IoT and the Ages of Antitrust

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IoT and the Ages of Antitrust

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§ 1. Is there anything special about the IoT?

In the last few years, antitrust lawyers have as usual split in their assessment of the impact of big data on competition. On the one hand, we had the “business as usual” guys; on the other hand the “this time it is different” guys.

This is normal; in a way it tells us more about the psychology of the people concerned than about the issue itself. Some three years ago Bocconi organized a seminar about information and antitrust.¹ Herbert Hovenkamp, the *doyen* of American antitrust scholarship, was leading the Olympian bunch of scholars who said, well, it is a matter of empirical evidence and as yet we do not have evidence of dramatic shifts. I myself – *si parva magnis componere licet* – was in the opposite camp, contemplating the emergence of powerful intermediaries intent on building enduring dominance over ever expanding markets.² But then I am afraid I am a quite excitable chap.

* This paper is based on a presentation delivered at the Round Table on IoT and the Circular Economy, Brussels, 16.5.2017, on which see <https://nexacenter.org/iot>.

¹ <https://www.knowledge.unibocconi.it/notizia.php?idArt=13977>

² The literature on antitrust and open data is rather extensive, as any research with Google may show. Therefore I confine myself to quoting the articles I have actually read (M. MAGGIOLINO, *Big Data e prezzi personalizzati*, in *Concorrenza e mercato* 2016, 95 ss.; D.L. RUBINFELD-M. S. GAL, *Access barriers to Big Data*, in available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2830586 forthcoming in *Arizona Law Review* 2017; J. DREXL, *Designing competitive markets for industrial data – between proprietisation and access* (October 31, 2016) Max Planck Institute for Innovation & Competition Research paper No. 16-13; G. SURBLYTÉ, *Data-Driven Economy and Artificial Intelligence: Emerging Competition Law Issues*, (August 5, 2016) Max Planck Institute for Innovation & Competition Research paper No. 16-08; J. DREXL-R. HILTY-L. DESAUNETTES-F. GREINER-D. KIM-H. RICHTER-G. SURBLYTÉ-K. WIEDEMANN, *Data Ownership and Access to Data – Position Statement of the Max Planck Institute for Innovation and Competition of 16 August 2016 on the Current European Debate* available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2833165) without trying to fit them into the dichotomy I presented. I also had the benefit of reading several insightful papers in advance of their publication thanks to the courtesy of their authors: E. PROSPERETTI, *Algoritmi dei big data: temi regolamentari, responsabilità, concorrenza*; M. MAGGIOLINO, *Concorrenza e piattaforme: tra tradizione e novità*; M. NUCCIO, *Contestable markets and price discrimination in data-driven businesses*; M. MAGGIOLINO, *I Big Data tra Stati Uniti ed Unione europea*; G. COLANGELO-M. MAGGIOLINO *Data protection in Attention Markets: Protecting Privacy through Competition*, in *Journal of competition law and practice*, 2017 (all forthcoming).

My (brief) remarks on the interface between big data and antitrust I refer to in the text are in *The new paradigm of creativity and innovation and its corollaries for the law of obligations*, in Peter Drahos-

So why fall into the same trap again and ask the same question once more in connection with the Internet of Things? Well, unsurprisingly, because my idea is that this time it really *is* different. In which ways?, one may ask. To this I have three replies.

The first one has to do with *quantities*. The web as we have known it in the last thirty-something years was about connecting communication devices, like computers and (more recently) smartphones. IoT goes well beyond that: it is intended to connect things: smart, connected products, of which IT is an integral part.³ Thermostats, wearables, engines, fridges, tires, tennis rackets, lawnmowers, what have you. It is true that analytically all these are computers, as Bruce Schneier rightly points out⁴; but actually they are something else plus a computer; thus the amount of data they are bound to generate and connect via networks is in a different order of magnitude. In this connection we never should underestimate the power of exponential.⁵

The second one has to do with *quality*. We can get a feeling of the process under way referring to the notion of circular economy. Imagine what happens when a product is made available as a service: Rolls-Royce engines for aircrafts; tires for vehicle, and eventually self-driving cars, not to be sold but leased,⁶ so that in accordance with the tenets of what is designated as “predictive maintenance” the supplier, who retains property, constantly receives all the information required to optimize product life cycles, including repairs, maintenance, replacements, etc. Also, technology giants always benefited from network effects: the more users use a search engine, the more attractive it becomes to resort to it. Now the velocity, volume and variety of data generated by IoT

Gustavo Ghidini and Hanss Ullrich (eds), *Kritika: Essays on Intellectual Property*, Vol. I, Edward Elgar, Cheltenham, 2015, 134 ff.

³ See among the many WORLD ECONOMIC FORUM, *Intelligent assets. Unlocking the Circular Economy Potential*, 2016; PH.N. HOWARD, *Pax Technica. How the Internet of Things May Set Us Free or Lock Us Up*, Yale University Press, 2015; M.E. PORTER, J.E. HEPPELMANN, *How Smart, Connected Products Are Transforming Competition*, in *Harvard Business Review*, November 2014 (<https://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition>); D. BANDYOPADHYAY-J. SEN, *Internet of Things – Applications and Challenges in Technology and Standardization*, 2011, 49 ff. in *Wireless Personal Communications*, available at https://www.researchgate.net/publication/51890865_Internet_of_Things_Applications_and_Challenges_in_Technology_and_Standardization

⁴ B. SCHNEIER, *Lessons From the Dyn DDoS Attack*, 8 November 2016, in https://www.schneier.com/blog/archives/2016/11/lessons_from_th_5.html

⁵ As once more underlined by S. QUINTARELLI, *Costruire il domani. Istruzioni per un futuro immateriale*, il Sole 24 ore, Milano, 2016, 21-24.

⁶ WORLD ECONOMIC FORUM, *Intelligent assets. Unlocking the Circular Economy Potential*, quoted above at note 3, 25 ff.

bring with them a promise of extra network effects. As the Economist recently put it, “the more data Tesla gathers from its self-driving cars, the better it can make them at driving themselves”.⁷

The third reason why I believe that IoT poses a distinctive antitrust challenge has to do with *scope*. Originally, digital technology exploited the twin levers of zero marginal cost and of operating as platforms on two-sided markets to occupy a number of fields where powerful incumbents rapidly lost ground. This was no mean feat; and legacy businesses are still nursing the wound.⁸ My point is that the inroads were, after all, more limited than one thought at the time: more or less music, advertising and entertainment (only in part, though). During a conference in Torino a couple of years ago Luciano Floridi referred to the size of the advertising industry; and equated it to the size of the Swedish economy. What he meant is that the space taken over by digital was huge. My reaction was (and is) the opposite: here we are still talking small chips. Small chips, to come to the point I am making, if we have in mind what is the room for expansion enabled by IoT: cars, transportation systems, real estate, logistics and, yes, healthcare and education. We are no longer talking just of two-sided markets: big data amassed as a by-product of the activity in one area feeds and incites the expansion into X other sectors. Currently the incumbents which are in the sights of businesses harnessing technology – by which I do not mean only technology giants, but also incumbents who are smartening up to embed technology to transform their original business models – are no more only legacy businesses, but also the ancient sovereigns. The goods and services provided by the declining welfare State are the ideal hunting ground for smart businesses, feeding on the information voraciously collected by means of the IoT and made scintillating and gleaming through machine learning and artificial intelligence.

§ 2. Antitrust. Past and Present.

So, in fact, what we are really talking about is the extraordinary accumulation of power which may be enabled, in a future which is not distant but already happening, by

⁷ The Economist, *The world's most valuable resource is no longer oil, but data*, 6 May 2017.

⁸ J. TAPLIN, *Is it time to break up Google?* in NYT 22.04.17 (lamenting that since 2001 publishing and music, in spite of shedding 50% of their employees, have lost 70% of their profits).

resort to the intelligence and insight promised by IoT.⁹

In our societies, the traditional remedy to economic power has been, and still is, antitrust. Here we are talking about market power; but not only about market power, also – and maybe first – about political power. The US experience is in that regard exemplary. As Senator Sherman said in a powerful speech made on the floor of the US Congress during the passage of the 1890 Act bearing his name, “If the concentrated powers of this combination are intrusted in a single man, it is a kingly prerogative, incompatible with our form of government”.¹⁰ Antitrust deals with economic power for reasons of sovereignty.

This is the reason why in the US first, then in a growing number of European States and finally in a steadily increasing number of legal systems, we have witnessed to the adoption of antitrust or competition laws.¹¹

What is then the interface between IoT and antitrust laws? Before we go further in this direction, we should pause for a moment to consider the defining features of antitrust, in terms of tools and in terms of underpinnings.

On the former count, tools, if we accept some oversimplification, we may well say that in most legal systems the pillars of antitrust laws are three. *First*, a prohibition of agreements in restraint of competition (cartels, as they sometimes are called); *second*, a prohibition against unilateral conduct amounting to exploitation of market power, or, in other words, abuse of dominant position in European parlance and monopolization in the US; *third*, a control over mergers entailing a lessening of competition.

As to the underpinnings, we should keep in mind that antitrust was born at the time mass production and distribution of goods took off. The Sherman act was born more or less in the same years when the West and East Coast of the US were connected by rail. So antitrust was from the start linked both to mass production and to a unitary market. At

⁹ The timing and pace of the progress of IoT gives a sense of urgency to much of the current research, which easily detectable in recent contributions such as U. PAGALLO-M. DURANTE-S. MONTELEONE, *What is New with the Internet of Things in Privacy and Data Protection? Four Legal Challenges on Sharing and Control in IoT*, in (Ronald Leenes, Rosamunde van Brakel, Serge Gutwirth, Paul de Hert eds), *Data Protection and Privacy: (In)visibilities and Infrastructures*, Springer 2017, 59 ff.

¹⁰ See D. MILLON, *The Sherman Act and the Balance of Power*, in E.T. Sullivan (a cura di), *The Political Economy of the Sherman Act. The First One-Hundred Years*, Oxford, 1991, 111.

¹¹ For a political sciences viewpoint see the still remarkable treatment by J. BRAITHWAITE-P. DRAHOS, *Global Business Regulation*, Cambridge University Press, Cambridge, 2000, 175 ff.

the same time, it was a federal prerogative: a single sovereign tackling private market – and political – power.

We will come back to this characterization in a moment. In the meantime, we fast forward to the present day to have a closer look at the interface between IoT and antitrust.

§ 3. The Interface Between IoT and Antitrust.

The three pillars of antitrust I just mentioned may turn out to be useful as a way to designate the steps we have to go through in exploring the relationship between the antidote of competition law and the market power enabled by the IoT.

3.1. *The prohibition of agreements in restraint of competition.* The first pillar resides, according to the previous categorization, in the prohibition of agreements in restraint of competition, be they between (or among) competitors, i.e. horizontal, or between businesses at different levels of the relevant market.

Here, what we most frequently come across in the most recent literature is a quite specific concern, which is described by the idea of a “price fixing algorithms”.¹² I am not sure that this phenomenon, whereby reciprocal adjustment of prices is the outcome not of human decision but of software and algorithms, is to be specifically tied to Big Data and even less so to the IoT, except, of course, that machine learning and AI may be instrumental in honing the mechanism. However, my impression is that, as the “business as usual” guys are likely to reasonably suggest, there is not much novel or special in this practice, except that detection may indeed require that enforcers update a bit their tools, as it is anyhow their duty. We might as well think of price fixing algorithms as the preserve of robots of some sorts. In this (not unlikely) perspective, all we have to do is to beware of the *homunculus fallacy*, which, as prof. Balkin cautions us,¹³ may lead us to forget that behind the robot, or, indeed, the software and algorithm which direct it, there is always the human who is writing (or initiates the writing) of the code. After this – quite

¹² See again The Economist, *The world's most valuable resource is no longer oil, but data*, 6 May 2017 (“Trustbusters must also become more data-savvy in their analysis of market dynamics, for example by using simulations to hunt over algorithms colluding over prices”. A similar story in D.J. LINCH, *Policing the digital cartels*, in FT 9.01.2017 (questioning the lawfulness of Uber’s surge pricing, which really should be examined as unilateral conduct: see below, § 3.2.4).

¹³ J. BALKIN, *The Three Laws of Robotics in the Age of Big Data*, in 78 *Ohio State Law Journal* 2017, 7 ff. (of the pre-print) (“the problem is not the robot, is the humans”).

simple – analytic step, all we have to do is to resort to the traditional doctrine whereby collusion may be the result of conscious parallelism, which is prohibited even there is no exchange of words or nods; and we are back in a familiar environment.¹⁴

It is likely that, if we want to get a feeling about antitrust challenges which may be specifically linked to the IoT, we should turn elsewhere. Two examples come to mind. They both originate from the experience of the so called “circular economy”, which may have a remarkable number of upsides, as we all know, but at the same time may entail several competitive risks. We should pause for a moment to think about the notion of “product as a service”, i.e. our Rolls-Royce aircraft engines or Nesta-thermostats. The sensors of the “thing” collect the data; these are stored, pooled and analyzed, (for the moment) in the cloud; the data come back to the thing, this time possibly *via* the actuators activated by remote command, if and when an update, a repair, or other action, is necessary. Or we should consider tractors, I mean agricultural machines, which use data as input for their functioning, but are also in a position to collect, store and pool whole reams of data about soil humidity, crop metrics and so on.¹⁵

In either case, we may start to visualize the possibility of exclusionary agreements. The so called purchaser of the Thing is tied up to a service contract with the same supplier. It has been noted – and often bemoaned – that this way the nominal purchaser does not really “own” the Thing.¹⁶ This is only a part of the story, however. For antitrust purposes what is essential is that third parties may be shut out (“foreclosed” in antitrust parlance) from the repair and spare part markets. In turn, the Thing’s sensors provide data which may be re-used for a vast number of purposes other than the upkeep and maintenance of the Thing; the putative purchaser may be prevented from sharing the data generated by “her” (or “his”) Thing by contractual clauses.

Here we come across the issue which is often referred to using the notions of “silos” (all the information being accumulated in one place only) or of “walled gardens” (whereby the user is locked in the environment created by her provider). For sure, we

¹⁴ See already the EU Commission decision of 24 July 1969, in O.J. n. L 195 of 7 August 1969, 11 ff., case “Dyestuffs”

¹⁵ See J.A.T. FAIRFIELD, *Owned. Property, Privacy and the New Digital Serfdom*, Cambridge University Press, 2017.

¹⁶ See the research conducted with the support of a grant provided by eBay by our Nexa Center: <https://nexacenter.org/iot>.

may get a feeling that in these areas contractual arrangements tying the user to her provider may cause competitive harm. However, we should also consider that the exclusionary effect here depends not only – and not so much – on what is “written” into contracts, on the exclusionary “object” or “effect” of contractual arrangements. What is crucial is the *de facto* position of the supplier, who may well be the only business in a position to provide the service (for “products as a service”) and to distill information from the data gathered from the Thing (for the tractors in our example).

So we are entering the area of unilateral conduct. Let us turn therefore to the second, and in my opinion here most important, pillar.

3.2. *The prohibition of abuse of market power.* Sec. 2 of the Sherman Act and Art. 102 TFUE are based on two requirements, which concern market structure and market behavior: the antitrust prohibition sets in when and to the extent (i) a dominant position (or, in the US parlance, monopolization) is established: structure; and (ii) such market power is exploited by its holder to the detriment of competitors and of the competitive process: behavior.

In establishing whether the prohibition applies to industries which embed IoT, we come across a number of difficulties, which concern both levels: the measurement of market share, the existence of barriers to entry, the control over an essential facility, as far as *structure* is concerned; the abusive character of the conduct, in connection with pricing, exclusionary practices and innovation markets, as far as the market *behavior* is concerned. Let us have a look at these issues in turn.

3.2.1. *Market share.* We have seen that IoT is often used in multisided markets.¹⁷ We should add now that often the good or the service is given away for free, in one or more of these markets. Now, to establish dominance you have to define a relevant market, in terms both of territory and goods and services. Which market is relevant market? And how do we go about to establish market share for a good or a service which is given away for free?

3.2.2. *Barriers to entry.* It has been noted that the adoption of IoT reshapes industry structure. This means that businesses which never competed before all of a

¹⁷ § 1.

sudden become rivals, e.g. competing for the key role in the connected home.¹⁸ Disruption may entail new entrants, leapfrogging, increased contractual power for suppliers of components: in a word, fresh blood for open markets and competition.¹⁹ However, we should not get caught by enthusiasm in this regard, as there are also quite a few serious competitive downsides to reckon with. How about vertical integration? That a business fed by all the data collected and stored via IoT may resort to data analytics to gain a competitive advantage in downstream markets and thereafter to erect entrance barriers is a possibility which is currently being tested in connection with Big Data.²⁰ We may surmise that the same issue will come back with a vengeance when the data which feed the downstream leverage are collected *via* IoT and honed by means of machine learning and AI. It seems to me that we are not in a position to make accurate forecasts in this regard, however, as it would seem that competitive advantage in one field does not always automatically transfer to (what once were described as) contiguous markets, as the Microsoft's failure to recover market share for Bing would seem to indicate.

The same doubts arise in connection with network effects, or, to be more accurate, with the extra network effects which IoT would appear to entail. They may be temporary, as someone suggests;²¹ or they may loom large to foreshadow the future of indefeasible, "eternal" business empires. We do not know. Which is a good reason to keep the guard high.

3.2.3. *IoT as an Essential Facility?* Are the data collected *via* the IoT and stored, pooled, matched and merged with other data, and subsequently analyzed to be considered an essential facility so that any person or entity who has control over it may be subject to an obligation to share its contents and grant access to third parties? Or, to put the question more simply, is IoT data an essential facility for antitrust law purposes?

In a way, the question may be seen as a sequel to the parallel issue which has been

¹⁸ M.E. PORTER, J.E. HEPPELMANN, *How Smart, Connected Products Are Transforming Competition*, quoted above at note 3, 14.

¹⁹ For an effective illustration see once more M.E. PORTER, J.E. HEPPELMANN, *How Smart, Connected Products Are Transforming Competition*, quoted above at note 3, 11-17.

²⁰ See http://europa.eu/rapid/press-release_IP-17-1784_en.htm.

²¹ M. NUCCIO, *Contestable markets and price discrimination in data-driven businesses*, quoted above at note 2.

debated for a while now in connection with Big Data.²² Which is unsurprising: by now we have several times had a chance to realize how much of the issues concerning the IoT really are germane to the corresponding issues in the Big Data field, with an added twist when IoT is concerned. Now, I would like to add a comment to the original Big Data debate, by saying that I do not agree that there is a three-pronged alternative between treating Big Data as a public good, as the object of a property right or a *de facto* controlled entity which may be made available to third parties by contractual agreement. Actually, my reservation is specifically about the characterization of Big Data as a public good.²³ If one understands the notion of public good as economists do, which means a resource which exhibits features of non-rivalry and non-excludability which lead to its underprovision,²⁴ then we cannot speak of Big Data as a public good unless we show that there is a market failure in supplying that good at the level which is optimal for society's welfare and that such market failure calls for the grant of an incentive in the form of exclusivity.²⁵ Now, it seems to me that there is no such proof of market failure either in the collection, the storing, the pooling, or in the analyzing of such Big Data; and even more so in connection with data accumulated through the IoT.

The real question here is rather the reverse: that making IoT data artificially excludable may generate externalities. Information goods are subject to enclosure

²² See D.L. RUBINFELD-M. S. GAL, *Access barriers to Big Data*; G. SURBLYTÉ, *Data-Driven Economy and Artificial Intelligence*; and J. DREXL-R. HILTY-L. DESAUNETTES-F. GREINER-D. KIM-H. RICHTER-G. SURBLYTÉ-K. WIEDEMANN, *Data Ownership and Access to Data*, all quoted above at note 3, to which add H. ZECH, *Data as a tradeable commodity*, in (Alberto de Franceschi ed) *European Contract Law and the Digital Single Market*, Intersentia, Cambridge, 2016 available at https://www.academia.edu/28029630/A_De_Franceschi_ed_European_Contract_Law_and_the_Digital_Single_Market

²³ As suggested by EUGENIO PROSPERETTI, *Algoritmi dei big data: temi regolamentari, responsabilità, concorrenza*, quoted above at note 2.

²⁴ For a classic treatment of the notion of public goods see J. HIRSHLEIFER, *The Private and Social Value of Information and the Reward to Inventive Activity*, in 61 *Am. Econ. Rev.* 1971, 561 ff. and W. LANDES-R. POSNER, *An Economic Analysis of Copyright Law*, in XVIII *Journal of Legal Studies* 1989, 325 ff.

²⁵ That is the first of the three Ps, Property, where the other two Ps are Patronage and public procurement: see the classic work by P. DAVID, *Intellectual Property Institutions and the Panda's Thumb: Patents, Copyrights, and Trade Secrets in Economic Theory and History*, in M.B. Wallerstein-M.E. Moguee-R.A. Schoen eds., *Global Dimensions of Intellectual Property Rights in Science and Technology*, National Academy Press, Washington, D.C., 1993, 19 ff., expanded in a later and memorable presentation at the Alessandria University, *Le istituzioni della proprietà intellettuale e il pollice del Panda: brevetti, diritti d'autore e segreti industriali nella teoria economica e nella storia*, in (G. Clerico and S. Rizzello eds), *Diritto ed economia della proprietà intellettuale*, Cedam, Padova, 1998, 9 ff., 24 ff., 28 ff.

through digital technology;²⁶ data collected, stored and pooled through the IoT are no exception to this rule. Therefore the crucial question does not arise upstream, in connection with any incentives which may be required to enable its generation, but rather downstream, in connection with access by third parties which may have interest in sharing this pool of knowledge. This is the context in which we have reason to ask whether the information accumulated via IoT has to be dealt with as an essential facility; and whether the best way to balance the interest of the businesses investing in IoT and the outsider wishing to have access to it is to be found in antitrust intervention, which, is suggested, may be inappropriate in some regards,²⁷ or in contractual arrangements as the ones which have led to FRAND obligations, or even in legislative intervention in specific sectors.²⁸

Just two more remarks about this issue. The first is that even *ex post* controls over access to digitized knowledge are complicated by the lack of open standards and of interoperability; which means that access, by whatever legal tools, may not be enough if it does not link to some overarching mandate of openness and interoperability. The second is that, while Big Data are not easily amenable to traditional forms of IP protection, other than the quasi-IP tool of trade secret,²⁹ IoT is different in this regard, as it would appear – dangerously – amenable to patent protection.³⁰

3.2.4. *Price discrimination.* If we are lucky, IoT will contribute to bringing about precision medicine and tailor made cellular therapy. By matching all the data about each and all of us, IoT may reach a knowledge of each of us, both as individuals and as members of a number of classes, which vastly exceeds the knowledge each of us has about herself or himself. What happens if this amount of knowledge about us is applied to

²⁶ C. HESS-E. OSTROM, *Introduction: An Overview of the Knowledge Commons*, in C. Hess-E. Ostrom (eds.), *Understanding Knowledge as a Commons. From Theory to Practice*, MIT Press, Cambridge-London, 2007, 3 ff., 10 ff.

²⁷ J. DREXL-R. HILTY-L. DESAUNETTES-F. GREINER-D. KIM-H. RICHTER-G. SURBLYTÉ-K. WIEDEMANN, *Data Ownership and Access to Data*, quoted above at note 2, 9 f. and JOSEF DREXL, *Designing competitive markets for industrial data*, quoted above at note 2, 42 ff. Indeed, how can a competitor point to a new product for which she requires access to the data pooled by the dominant entity, if she cannot even begin to fathom what the new product may be until she had access to such data?

²⁸ A good example might be the information rules on testing of chemicals under the REACH legislation: see J. DREXL, *Designing competitive markets for industrial data*, quoted above at note 2, 63 ff.

²⁹ H. ZECH, *Data as a tradeable commodity*, quoted above at note 22, 6 of the manuscript.

³⁰ G. NOTO LA DIEGA, *Software Patents and the IoT in Europe, the United States and India*, in 39 *EIPR* 2017, 173 ff.

our economic decisions? The reply is straightforward: welcome to the world of perfect price discrimination (PPD).

Is this a antitrust problem? Generally antitrust lawyers deny this.³¹ They do have a point, to the extent we are willing to stick to the notion of the goals of competition law we inherited from the past. Price discrimination may be efficient; and having antitrust authorities stepping in and dictating which compensation is “fair” may be conceived as a fool’s errand which moreover smacks of unwarranted intervention of public powers into the free play of market forces.

I rather sympathize with hard-nosed antitrust lawyers; but one question looms large. Should we stick to the traditional notion of antitrust law in the first place? The outcome of perfect price discrimination is the erosion of what in economists’ jargon is called consumer surplus: Uber’s surge pricing for all and across the board.³² If we move from micro- to macro-economics, this means that the biggest problem of the last few decades in countries of old industrialization, i.e. inequality, would be exacerbated: an even bigger slice of the GDP pie would go to profits and be taken away ultimately from wages. Antitrust lawyers tend to say that no, this would not happen: PPD would make shareholders richer. They should know better: since Berle & Means (1929) we have known all along that extra-profits do not go to the mass of shareholders but are appropriated by a restricted group of powerful insiders.³³

So what happens to our antitrust assessment of PPD if we start to think that antitrust is not only about economic efficiency and deals not only with market but also with political power? Is still PPD no problem at all?

3.2.5. *IoT-specific exclusionary practices.* What do we make out, from an antitrust perspective, of i. exclusivity clauses in data transfers, whereby, e.g. owners of IoT embedding tractors consent to the flow of the vast array of data we mentioned to the “seller” of the vehicle and are prevented from sharing them with third parties, including

³¹ M. MAGGIOLINO, *Big Data e prezzi personalizzati*, quoted above at note 2, 111 ff.; M. NUCCIO, *Contestable markets and price discrimination in data-driven businesses*, quoted above at note 2.

³² For a discussion of the issue see ARIEL EZRACHI-MAURICE E. STUCKE, *Virtual Competition. The Promise and Perils of the Algorithm Driven Economy*, Harvard University Press, Cambridge (MA), 2016 (INT 2409).

³³ For a more recent discussion J. PLENDER, *From Going Off the Rails*, John Wiley and Sons, Chichester, 2003.

the tractor owners' association? How about ii. contractual restrictions (and/or technical protection measures) which prohibit reverse engineering by a user of the software embedded in a thermostat or in an aircraft engine?³⁴ We have seen that data collected through IoT may be made accessible by agreement between their holder and a third party (data trading).³⁵ What is the antitrust status of iii. re-use restrictions in these agreements? Also users' freedom may be restricted, e.g. by limiting – contractually, but even more so de facto: iv. – the “portability” of their data at the time they should decide to move on to another provider.³⁶

Here we find quite a lot of food for our thoughts. To begin with, we could note that many of these restriction concern areas which would nicely fit into the notion of circular economy. Product as a service and predictive maintenance may well optimize the use and re-use of resources; but they do entail risks of competitive restriction.

Such a risk may be conceptualized – as we initially suggested in § 3.1. – in terms of arrangements caught by the prohibition of agreements in restraint of competition. However, several of these restrictions may find their basis in factors other than contractual arrangements: see ii. and iv. If the restriction is based on a technical measure or in *de facto* technological control, rather than on contract, then the prohibition of (vertical) restrictions of competition does not come into play. Resort to the prohibition of abuses of dominant position becomes the relevant yardstick. But the prohibition is triggered only if and when the party striving for competitive advantage is in a dominant position or, in other words, has the amount of market power which is the required predicate for triggering the prohibition on unilateral conduct. Establishing this requirement has its own difficulties, which we encountered before (§ 3.1).

³⁴ See G. SURBLYTÉ, *Data-Driven Economy and Artificial Intelligence*, quoted above at note 2, 19 ff. (discussing the compatibility with the decompilation and interoperability provisions of the directive and the impact of the judgement issued by EU Court 2 May 2012 (Grand Chamber), case C-406/10, SAS Institute Inc. v World Programming Ltd, case «SAS Institute»; notice that research on the notorious “defeat” device employed by VW to tamper with diesel emissions for cars in test mode would have been unlawful, except for a broad, public interest “fair use” defense).

³⁵ For a discussion see European Commission, *Commission Staff Working Document on the free flow of data and emerging issues of the European data economy*, accompanying the document *Communication Building a European Data Economy*, {COM(2017) 9 final} Brussels 10 January 2017 {COM(2017) 9 final}, 15 ff.; H. ZECH, *Data as a tradeable commodity*, quoted above at note 22, 4 ff. of the manuscript.

³⁶ For a treatment of the issue see D.L. RUBINFELD-M. S. GAL, *Access barriers to Big Data*, quoted above at note 2, 20 ff. of the manuscript; European Commission, *Commission Staff Working Document on the free flow of data*, quoted above at note 35, 48 ff.

Finally, I quite sympathize again with traditional antitrust lawyers' idea that antitrust may not be the most appropriate tool to address concerns of abusive or unfair conduct towards end-users.³⁷ It seems to me however that the reverse may not be true: it may well be that data protection provisions, such as Art. 20 of the General Data Protection Regulation, which mandates data portability or other provisions which counter information or power asymmetry between businesses and end-users may start off from the goal of protecting end-users but may entail remarkable benefits also for the competitive structure of markets, preserving rooms of freedom and autonomy of end-users which ultimately may end up increasing competitive openness.

3.2.6. *Innovation markets and "second-mover" advantages.* I must confess that I hesitate as I move on to the next area of unilateral behaviour which is potentially subject to antitrust scrutiny. Here, while I am very well aware that the interface between IoT and antitrust is liable to bring up several other issues, including the dangers arising from vertical integration, which are, to say the least, controversial,³⁸ I will focus on the impact which IoT may have on innovation markets.

There are two sides to the story.

3.2.6.1. Why was Microsoft so opposed to the Google Book project? The reply is simple: they were afraid of the competitive advantage Google could reach by obtaining exclusivity in running their software over an unprecedented amount of text. Imagine what can be done now – and even more so in the next future – by honing machine learning, algorithms and AI through the three Vs of IoT, volumes, variety & velocity. A fourth V comes in mind, which is not veracity, as somebody quite appropriately suggested, but voracity.

What may a newcomer hope to do against machine learning and AI employing incumbents – which, let me repeat, are not only US and Chinese tech giants but also those of legacy incumbents which will in the meantime have smartened up – other than to pose its start up on the launch ramp and hope to cash in by selling to incumbents? (more about this in § 3.3).

³⁷ See the point made by M. MAGGIOLINO, *Big Data e prezzi personalizzati*, quoted above at note 2, 127 ff.

³⁸ As shown by the fine imposed by the EU Commission for giving illegal advantage to its own services: see http://europa.eu/rapid/press-release_IP-17-1784_en.htm .

3.2.6.2. I know I may be making a controversial statement by saying that the total surveillance by sovereign (both in totalitarian and “democratic” nations) is only one side of the same coin, where the flipside is the omniscience of tech giants. But even mainstream sources, such as the Economist,³⁹ are not reticent in referring to tech giants’ omniscience. Here is what they say: “the giants’ surveillance systems span the entire economy: Google can see what people search for, Facebook what they share, Amazon what they buy. They own app stores and operating systems, and rent out computing power to start up. They have a ‘God’s eye view’ of activities in their own market and beyond. They can see when a new product or service gains traction, allowing them to copy it”, or – but we will come to that in a moment – “simply buy the upstart”.

Anecdotal evidence seems to confirm that this is happening a lot. Snap’s worst nightmare is that Facebook’s strategy consists in imitating them. Technology firms have litigated – and won – unfair competition cases against Facebook for exploiting the access the latter had to their technology to imitate them. Shops hosted in Amazon have seen their sales plunge when their distributor has become their competitor.⁴⁰ Can it be argued that a strategy which is available to tech giants, but not to many other businesses, is to wait out in the wings to see what happens on the ground and then lean on with all their might, exploiting a kind of “second mover’s advantage”.

Maybe so. For sure it is not easy to put together these two bits; and even less to draw conclusions about them in antitrust terms. To the extent the two stories make sense, the message is that for tech giants the game in town is “Tails I win, heads you lose”. But what are the antitrust implications? For sure legal rules, including competition law rules, cannot at the same time blow hot and cold on the same behavior, seeing as threats both leadership in innovation and strategic waiting games.

The unease is not assuaged, but rather multiplied, by the fact that the first antitrust doctrines which come to mind to tackle this kind of two pronged behaviour are known under the labels of “leveraging to new monopoly” and “incipiency”, which have the

³⁹ The Economist, *The world’s most valuable resource is no longer oil, but data*, quoted above at note 7.

⁴⁰ See A. Flanagan’s presentation available at https://agenda.unibocconi.it/eventi/attach/PPT_Flanagan20140617202526.pdf

privilege of being among the most discredited tools in the field.⁴¹

So I stop here, with my feeling of unease, just to move on to the next pillar.

3.3. *Mergers*. In the best of antitrust tradition, mergers are never prohibited *per se*, as they may lower production costs and entail efficiencies. They may be subject to control, either *ex ante*, under a mandatory notification system of merger plans; or *ex post*, after the transaction has taken place.

Now, here again these traditional – and, admittedly, quite well functioning – systems are proving increasingly inappropriate in all high technology fields, i.e. in an area which is much wider than Big Data and IoT but also includes these. One of the reasons of the difficulty is metrics. Combined market share used to be one of the tests; combined revenues used to be the triggers which initiated either the obligation to notify antitrust authority or prompted *ex officio* antitrust intervention.

Neither measurement is likely to be significant for businesses operating in multi-sided markets. Goods and services may be given away for free, at least in one of the markets (typically: the consumer market; but the same could well happen in many of the product-as-a-service markets, where, for instance you are not likely to get a monthly bill for your thermostat).

So, what are the proxies which should take the place of these metrics? Employment figures would be a non-starter, as WhatsApp purchase in 2014 by Facebook shows: less than 60 people were employed by the acquired entity. But in the meantime we have been wised up to the competitive significance of the acquisition.⁴²

So what should be done in this connection? We must come up with something, as “simply buy[ing] the upstart” is the alternative strategy the Economist suggested tech giants resort to when they do not choose to engage in wholesale imitation of the minnow. So the hole, or, more to the point, both holes, must be plugged.

⁴¹ Possibly the disparagement is no longer totally well deserved; the blame aspersed on these two doctrines (famously by R. BORK, *The Antitrust Paradox. A Policy at War with Itself*, Basic Books, New York, 1978) was elaborately argued in the olden times when competition was *in the markets*; and might have lost some of its validity since much of competition has become *for the market*.

⁴² See J. DREXL-R. HILTY-L. DESAUNETTES-F. GREINER-D. KIM-H. RICHTER-G. SURBLYTÉ-K. WIEDEMANN, *Data Ownership and Access to Data*, quoted above at note 2, 10. For a tiny corollary is in http://www.repubblica.it/economia/2017/05/12/news/antitrust_multa_da_3_milioni_a_facebook_-165255725/

I am not saying that we do not have room for fresh thought. Well, the amount of consideration paid for the merger or acquisition could be a starting point to assess the significance. Market definitions rejigging ancient Herfindahl-Hirsch and Gini indexes to take into account multiplatform businesses could be figured out. For IoT and algorithmic innovation markets I would suggest considering new metrics, such as exabytes of crunchable data. Acquiring giants could be kept on their toes by dispensing altogether with clearance systems based on advance notification, replacing or integrating these with the continued possibility of *ex post* intervention.

§ 4. Rejigging Antitrust

Is anything of the sort thinkable within the limits of antitrust as we know it today? Frankly, no.

This does not mean that there is no way forward. To the contrary. My idea is that we should once more take stock of the underpinnings of classical antitrust to “reload” it to serve the needs of the present, as we sketched them out a bit earlier. My idea also is that rejigging antitrust in a way which is adequate to challenges such the ones posed by the IoT and AI requires a leap forward in two areas: *first* identifying the appropriate regulatory fora and *second* identifying the appropriate *narratives*, for the medium and the short term, for the role of antitrust intervention in the decades to come.

Let me give a few thoughts on both accounts.

To do so, however, I should first reconnect the present to the past. As we have just seen, originally US antitrust was (Federal) State-centric: it was linked to the take-off of mass production and distribution and to the birth of an American unitary market; at the time foreign trade was relevant to the extent it had an immediate and substantial impact on domestic competition within the limits of the widely accepted doctrine of extraterritoriality.⁴³ Also, originally antitrust was about both market and political power.

⁴³ See W.L. FUGATE, *Foreign Commerce and the Antitrust Laws*, Little Brown Co., Boston e Toronto, 1982; J.R. ATWOOD-K. BREWSTER, *Antitrust and American Business Abroad*, Colorado Springs, 1981. The convergence of US jurisdictional criteria with the international consensus is shown e.g. by I.E. SCHWARTZ, *Deutsches Internationales Kartellrecht. Der Anwendungsbereich des Gesetzes gegen Wettbewerbsbeschränkungen unter vergleichender Heranziehung des Amerikanischen Antitrustrechts*, Carl Heymanns Verlag, Koeln, Berlin, Bonn, München, 1968 and J. SCHWARZE, *Die*

While the Chicago School at some point persuaded us that antitrust was about optimal allocation of resources, productive efficiency and ultimately consumer welfare,⁴⁴ this much later account is not true at all: as Senator Sherman's words clearly and beautifully show in the quote made in § 2, antitrust it was about sovereign prerogatives in a democracy.

The EU antitrust experience develops from a similar starting point; but it is (understandably) more timid in this second regard. It still was and is State-centric, except that the looser EU Union takes the place of the US Federal system. Its orientation, however, is mainly economic, in accordance with its prevailing "functionalist" and market-driven slant.⁴⁵ It is rare that in EU competition law non-economic goals crop up, with one main exception: the overriding objective of contributing to the creation and preservation of the internal market, which we may conceive of as "political" to the extent it mandates (recurring) deviations from strict economic optimality.

Yet, to remain true to its underpinnings, antitrust has to evolve to face up to two novel challenges. Digital networks, pre- and post IoT, are ubiquitous and global.⁴⁶ Therefore the territorial dimension can no longer be limited to selected (if vast and wealthy) geographical markets. Also power has evolved: it no longer takes the form of the steel, oil and coal trusts, which gave rise to American and European competition laws.

For these reasons, contemporary antitrust is in quest of a reply to the twin challenges I just mentioned. On the one hand it should strive to identify the appropriate regulatory fora to deal with the new global dimension of digital-network driven markets. On the other hand it should find new ways to deal with novel forms of market and political power. Let us look at the two challenges, keeping in mind all along the lessons we may

Jurisdiktionsabgrenzung im Voelkerrecht – Neuere Entwicklung im Voelkerrecht, Nomos, Baden Baden, 1994

⁴⁴ See R. POSNER, *Antitrust Law: An Economic Perspective*, The University of Chicago Press, Chicago and London, 1976 and R. BORK, *The Antitrust Paradox*, quoted above at note 41; on Posner's position see H. HOVENKAMP, *The Rationalization of Antitrust*, book review of R. POSNER, *Antitrust Law*, The University of Chicago Press, Chicago and London, 2001, in 116 *Harv. Law Rev.* 2003, 917-944, at 919 ff. and particularly 927 ff.

⁴⁵ On this aspect see the still excellent analysis by S. SCHEINGOLD, *The Law in Political Integration*, Center for International Affairs, Harvard University, Cambridge, MA, 1971.

⁴⁶ To the extent we forget for a moment the stark divide between China and the rest of the world: see PH.N. HOWARD, *Pax Technica*, quoted above at note 3, 183 ss.

learn at the interface of IoT and antitrust.

2 § 5. Identifying the appropriate regulatory fora

In this connection I will confine myself to a few remarks. What I find extraordinary, possibly for my comparative ignorance about the literature in the field, is the lack of adequate discussion about the identification of the appropriate regulatory fora among the competition law cognoscenti. This is striking, as that very question is at the centre of the inquiry in other disciplines. This is true for scholars dealing with the web infrastructure, both from a political sciences and a technological viewpoint.⁴⁷ The first thing which data protection and privacy scholars inquire about is jurisdictional: what is the optimal regulation level? What games are currently being played?⁴⁸ Similarly, political scientist have devoted much of their effort to develop a conceptual framework for this sort of inquiry.⁴⁹

Against this background, when we look for antitrust lawyers' contribution in the quest for the appropriate regulatory fora, the outcome normally turns out to be quite dispiriting. Yes, we all know that the idea of a WTO-inspired antitrust never took off; and for quite obvious reasons too. But is this a sufficient ground for our usual move, to go through a painstaking positivistic analysis of the thorniest questions at the intersection of antitrust and Big Data (and now also IoT) confining ourselves to the perspective of the jurisdiction where we teach and practice (or both), and then own up that an additional, while regulation still is basically local, "international" dimension should be included to

⁴⁷ See, among political scientists, M. MUELLER, *Networks and States. The Global Politics of Internet Governance*, The MIT Press, Cambridge (MA), 2010; among the technologists, D. BANDYOPADHYAY-J. SEN, *Internet of Things*, quoted above at note 3, 14 ss.

⁴⁸ U. PAGALLO-M. DURANTE-S. MONTELEONE, *What is New with the Internet of Things in Privacy and Data Protection?*, quoted above at note 9, 13 ff. (on the so called "Brussels effect"); V. MAYER-SCHÖNBERGER-Y. PADOVA, *Regime Change? Enabling Big Data Through Europe's new Data Protection Regulation*, in XVII *The Columbia Science and Technology Law Review* 2016, 315 ff. (noting at 327 ff. the possible disharmonizing effect of the GDPR rules concerning Big Data relevant "statistical purpose"). In a similar vein L. FLORIDI, *The Fourth Revolution. How the Infosphere is Reshaping Human Reality*, Oxford University Press, 2014, 167 ff. (on post-Westphalian politics and multi-agent systems).

⁴⁹ With outstanding results, as in the case of the cross-cutting analysis of J. BRAITHWAITE-P. DRAHOS, *Global Business Regulation*, quoted above at note 11, which spans from labour laws to telecommunications, from antitrust to IP, just to mention a few.

the inquiry.⁵⁰

This is quite a pity. Even more so if we pause to think that there is no ground for abdicating our task in this regard. As I just mentioned, scholars from other disciplines have laid the ground for us to go about the – admittedly difficult – task I am discussing. From their inquiries we know quite a lot about the mechanisms of legal change, domestic and global. These can be placed in a continuum which goes from the extremes of coercion to consensus encompassing the half-way houses of harmonization and regulatory competition.⁵¹ Also, the debate on optimal levels of regulation is not properly in its infancy. So why do not try to build on that?

Maybe one of the reasons for our antitrust-specific difficulty has to do with narratives, or, better, the lack thereof. Identification of fora and narratives are not separate issues; they are the two sides of the same coin. After all, you can't know where to bring your concerns to, until you do not exactly know what they are. In the final section I will try to say a few words on this.

§ 6. Antitrust Narratives for the 21st Century

The point I am trying to make in this connection is that, to realistically deal with competition issues in connection with the current landscape, where phenomena such as Big Data and IoT are playing or will be playing such a crucial role, we should take a fresh look at current power structures and, in doing so, shed many of the assumptions which guided us in the last, say, five decades. It is my impression going this way we are likely to get more of Senator Sherman and less of the Chicago School of antitrust.

Let me suggest that there are several good grounds to abandon law & economics orthodoxy at this junction. Some of these are endogenous: as economists warned us quite a long time, there may be too much even of a good thing. Between law and economics

⁵⁰ D.L. RUBINFELD-M. S. GAL, *Access barriers to Big Data*, quoted above at note 2, 44 ff. The authors will pardon me for singling them out in this regard; the fact is that their otherwise excellent contribution had raised my hope of finding enlightenment from them also on that front.

⁵¹ To the literature quoted above 49 one could easily add whole libraries: see among the many A.N. LICHT, *Games Commissions Play: 2x2 Games of International Securities Regulation*, in 24 *The Yale Journal of International Law*, 1999, 61 ff. (applying game theory to address the issue in financial markets) and G. HERTIG, *Imperfect Mutual Recognition for EC Financial Services*, in *Int. Rev. of Law and Economics*, 1994, 177.

there has been too much one way traffic.⁵² Others good grounds to distance ourselves from Chicago are more relevant to our conversation, as they are, so to say, exogenous; that is, they have to do not so much with the inherent limits of economics (all disciplines have their limitations), as with the current power structures antitrust is currently called to deal with. Maybe an example may help explaining why we are increasingly loath to follow EAL's argument. I refer here again to perfect price discrimination. Now antitrust lawyers are want to explain why they rather like PPD. Distributionally it may be terrible; it may exacerbate a phenomenon which appears unexplainable (to neo-marginalist economists, I mean) which is the sudden increase of the share of GDP which goes to capital as opposed to labour. But still, they say, it is "maximizing welfare". I am not sure I still buy into that; I am sure however that there are many areas in which such a line of reasoning appears increasingly questionable.

Let me now generalize a bit. Using a broad brush, digital technology markets may currently be characterized as having reached a level of concentration of power which is extraordinary, whichever metrics we employ. My point is that the more important metrics here are not the traditional ones which have to do with revenues, profits, market shares, but the ones which capture the rate of centralization or "siloesation" of networks and data. To deal with the power concentration resulting from centralization, antitrust should not supinely follow an economic approach, and even less a "more economic approach". To deal with power structures it should re-acquire its multipurpose character, which has been its main feature until fifty years ago, in order to capture the relevant dimension, concentration of power, in a way which Senator Sherman would like, as much as Chicago scholarship would censure it. Also, we should question the apparently rock-solid assumption on which US and EU antitrust were based when they were taken over by Chicago-oriented EAL approaches. Is consumers welfare gain the ultimate yardstick by which to measure competitive structure and behaviour? Even if this was the case in the past, is this still so now, even though tech platforms often operate in two- or multi-sided markets in which they tend to supply products and services to consumers for free and to base their business models on the revenue (often in the form of "cuts") they obtain from

⁵² C.A.E. GOODHART, *Economics and the Law: Too Much One-Way Traffic?* in 60 *The Modern Law Review*, 1997, 1 ff.

other merchants? How can these consumer welfare gains be measured?⁵³ Also, in the past we assumed that fairness of a business-to-business transaction was outside the purview of antitrust, unless its ultimate goal – and effect – was foreclosure, expulsion of competitors from the market.⁵⁴ Does these assumption still work when businesses operating in two- or multi-sided markets appear in a position to squeeze out of other businesses active in the same ecosystem an unconscionably disproportionate share of the revenue which the end-users, usually consumers, will bear?

What are then the goals, other than Pareto-optimality, which antitrust should then pursue? We may in this connection distinguish between medium and short term (in the long term, as Keynes once quipped, we will all be dead).

6.1. *Medium term.* Forgetting for a moment what can be done tomorrow, we may start to think with some degree of freedom about “the vision thing”. We are here to consider this side of Paradise, the enormous benefits that may accrue if dreams such as the ones advanced by the supporters of the circular economy as enabled by the IoT ever come true. To clarify this we can engage in the exercise of imagining Hell: that is what will happen if all the zettabytes of IoT go into silos or are captured in walled gardens: enormous centralization of resources and concentration of power, which may in discourage innovation, have an adverse impact on employment and income distribution and finally question the integrity of the political process.

Therefore, diffusion of power and decentralization of networks and of control over information should be, I suggest, the guiding principles for an antitrust which helps us to stay away from this Hell. But keeping the gates of Paradise open requires, well, openness. Standardization of data identifiers, of formats; interoperability. The guiding idea here should be to follow design principles and architectures inspired by the information commons as advocated by Elinor Ostrom. When information comes into bits, it is automatically prone to digital enclosure. The priority should therefore be to deal with it as a common pool resource.⁵⁵ Decentralization, or, rather, re-decentralization

⁵³ The question is raised now by DIANE COYLE, *Digital Platforms force a rethink in competition theory*, in *FT* 17 August 2017.

⁵⁴ As influentially argued by R. BORK, *The Antitrust Paradox*, quoted above at note 41.

⁵⁵ See C. HESS-E. OSTROM, *Introduction: An Overview of the Knowledge Commons*, quoted above at note 26, and BRETT M. FRISCHMANN, *An Economic Theory of Infrastructure and Commons Management*, in

should be the long term goal.

6.2. *Short term.* May policy makers be turned overnight into followers of Elinor Ostrom and Tim Berners Lee? This sounds a bit unlikely, for many reasons which again have to do with narratives and their plausibility.

However, there is a lot which may still be done which may draw support from many quarters and contribute in the short run to reversing the current course and to renewing the antitrust toolkit in the age of IoT.

Let me mention just a few points.

- (i) Lawmakers should abstain from creating new “enclosures” by providing additional IPRs on top of the (too many) we already have. There are reasons to believe that the creation of an IP right over Big Data would be dangerous and misguided;⁵⁶ the extension of patentability to IoT devices is another evolution which should be contained and kept in check;⁵⁷
- (ii) To the extent we believe that access to data and networks, rather than their appropriation, is advisable, antitrust may play a role in balancing the interests of the entities generating, collecting, pooling, analysing and re-using data.
- (iii) Digital platforms create ecosystems where smaller players play a crucial role; the temptation for the bigger fish is to suck away the substance from the smaller. The European Union has a special stake in preserving the role for its “nimble enterprises”, hoping that they may eventually evolve beyond the initial phase.
- (iv) Dealing with exclusionary practices (such as the ones visualized in §§ 3.1 and 3.2.5) with the tools of antitrust is a clear priority. Competition law has a long experience in balancing. Here we do have interesting issues to deal with. IoT is a driver of the development of the offer of “product as a

Minn. L.R. 2005, 917 ff.

⁵⁶ J. DREXL-R. HILTY-L. DESAUNETTES-F. GREINER-D. KIM-H. RICHTER-G. SURBLYTÉ-K. WIEDEMANN, *Data Ownership and Access to Data*, quoted above at note 2. See also <http://infojustice.org/archives/38778>.

⁵⁷ G. NOTO LA DIEGA, *Software Patents and the IoT*, quoted above at note 30.

service”.⁵⁸ This may be at the same time environment-friendly, enabling re-usability and resource recyclability; however, it may also generate lock-in by keeping third party suppliers (for repair services and spare parts) out of the “magic circle” of the original provider.

- (v) This leads to the emerging issue of the convergence of consumer law and antitrust law. We may – and possibly should – have misgivings about using antitrust law to advance goals of consumer protection.⁵⁹ However, the reverse is not necessarily true. Empowering users, by helping them to overcome informational and power asymmetries, may be a good thing in the perspective of consumer law; but it may also reduce the rate of lock-in and advance transparency, to the benefit of competitive openness.
- (vi) In the past, we have been able to decouple ownership of the pipes and access to them. Telecommunications is a good example. Maybe we can learn from this experience also when it comes to IoT networks.
- (vii) Decentralization of networks should be seen not only as a social and political goal, but also in its competitive dimension.
- (viii) Merger scrutiny and control should be given fresh thought (along the lines I tried to sketch out before in § 3.3).

This is quite a tall order to follow. However, it seems to me that none of the above points has a utopian ring about it. Which may be a good thing if we want to start getting a few things done, waiting for Paradise.

There is a final point which hasn’t been dealt as yet. How does this relate to the question raised above, of identification of the appropriate regulatory fora? Probably this is the easy part. We should stay away from grand designs, such as promoting the creation of a global antitrust, which is likely to prove impossible and undesirable: a certain rate of regulatory competition should be in place, at least for the next decade.

On the other hand, the narratives I have been sketching out suggest that there are negotiating tables which should be considered of paramount importance for advancing the goals of competitive openness and, yes, power decentralization. These include

⁵⁸ See above § 3.1.

⁵⁹ See above § 3.2.5.

international organisations, such as ITU; and private global organisations, W3C. What is decided there has a clear impact on the competitive structure of our digital future. The important thing is that at the table sit not only the Trade Departments' people.

Marco Ricolfi
