PLATFORMS, A CALL FOR DATA-BASED REGULATION

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I. INTRODUCTION

The public discourse on digital platforms has changed significantly from a naïve belief in their ability to solve any problem to blaming them for the many ills of modern societies. There is no day without a new call for regulation to be applied to this or that digital platform or to platforms in general. Those calls raise issues such as privacy, media plurality, non-discrimination, social exclusion, morality, etc. Yet, there have been few instances of actual regulation of platforms, through competition law enforcement to local regulation of ride hailing or accommodation sharing applications. Should there be a new type of regulatory setting to address issues raised by platforms?

First, I discuss what digital platforms are and what has been driving their development. Then, I turn to the issue of how to regulate platforms, when relevant.

In summary, digital platforms design and run data driven transaction environments. They are subject to complex dynamics due to their multisided nature. This calls for a new form of data-based regulation of platforms, where public policy objectives are attributed to platforms and their achievement validated through data analysis.

II. PLATFORMS ARE PLATFORMS

Platforms provide an environment for exchanges or interactions. In this paper, I call these "transactions," be they commercial or social.

Roughly speaking, transacting may take three forms: (1) direct contact between the two sides; (2) indirect contact where an intermediary takes over the role of one of the sides (reseller type of situation); or (3) via an intermediary, like a platform. There are many shades between those modes of transacting along who holds the property rights, who has contact with the other side or who bears the risks. All forms rely on data, algorithms and processing power. And all aim at addressing, in an optimal way, transaction costs. Platforms act as intermediaries and differ from other modes of transacting in at least three ways.

First, they design and regulate transaction environments. Platforms operate in many fields, though they systematically offer a dedicated environment to transactions. Platforms offer: (1) sharing usage of an expensive and underutilized asset, like Airbnb; (2) exchanging property rights, like eBay; (3) enabling better access to and better use of human capital (skills, knowledge, etc.) such as TaskRabbit; and (4) providing meeting points for social interaction such as social networks. Their design includes a set of rules that govern each step of interactions: who can join under what conditions, what information must be provided, the terms of transactions, rights and obligations, review systems, etc. Regulation enforces the rules.

This leads to the second difference to other forms of transacting: platforms are multisided, with transactions sides but also a "data side." No need to expand on the transactions sides. Although it is worth underlining that these can be social and not necessarily explicitly price driven (think of Tinder or Facebook). The data side is key and central. For sure, data is also important to some industries such as insurance or supermarkets. But in these it is not a central part of the transaction itself. Data is both an input and an output to platforms. As an input it allows transactions to proceed smoothly and efficiently through all their steps. Users' usage and preferences create datasets that make platforms more efficient but can also be monetized. Platforms can directly sell datasets to third parties. Keeping ownership of the dataset, they can generate revenues out of advertisements tailored to users' profiles at very granular levels. The intensity of platforms' reliance on the data side varies greatly from absence in the case of sharing economy platforms too strong for many social media sites, such as Facebook or YouTube.

A third difference is network effects. The demand from one side for platform services depends on the demand from the other sides. A potential member may choose to join in order to transact later because of the variety of possible partners for transacting. An important point to note is that the sign of the network externality between demands is not necessarily positive and may vary depending on the volume or types of users. For instance, access to a social network may decrease if too much space is devoted to advertisements or too much personal data is sold. Conversely, there are numerous instances of boycott from advertisers because they did not want to be associated to some content. Similarly, a marginal user may be deterred by the average use of the platform.

A platform offers a multisided environment that saves on, and internalizes, transaction costs.

Transacting can be broken down in two phases: (1) search and match; and (2) implement and enforce. For A and B to transact, they first need to find each other. Both public information, such as the Yellow Pages or a published price, and their own private information, such as their respective preferences, contribute to that search and match effort. If A and B agree on a deal, they match. Then the transaction is settled and implemented. This provides information and rights to each side. Finally, an enforcement mechanism makes sure that there is redress in case of issues. Frictions, such as directly quantifiable costs, that lead to second best equilibria, such as incompleteness of contracts, limit the space of possible transactions.

Digitization makes transactions more tailor-made and each step more observable and verifiable. That creates opportunities for platforms to better address personal preferences and decrease transaction costs.

A platform seeks to optimize its modelling of both sides of the transaction to get the best possible matches, while minimizing the costs of providing transaction specific information. For instance, digital platforms will use past transactions, automatic information flow (like location data) instead of asking for manual input. User directed search requires input on the part of the user when this is essential for the selection and cannot be approximated by the platform. Direct assignment mechanisms fit situations where there is little private value, value that the platform cannot approximate. Matching can then be implemented in an automatic way. The same goes for time sensitive transactions.

Parties to the transaction can implement truthfully, cheat or withdraw from the transaction and transact elsewhere, activating an outside option. Platforms attenuate these potential losses by intermediating. They accumulate knowledge on either side of the transaction so that what would be private information in a bilateral transaction becomes public within the platform's environment, and helps to establish trust. Some categories of transactions are more prone to cheating and require an ad-hoc environment. A way for a transaction to take place nevertheless is to get a third party involved who would monitor the implementation and enforcement of the transaction and punish any cheater to a level where it becomes irrational to deviate from compliance. For that, the two sides of the transaction have to provide data to that third party and accept its authority when there are conflicts to adjudicate upon. In addition, rating systems allow for reputation mechanisms to build trust in possible counterparties. The provision of data aims to make the implementation of the transaction verifiable. The settlement and enforcement mechanism may also include commitment devices such as pre-payment to the platform and again rating systems. The transaction environment must also include a mechanism for checking that the data has not been tampered with or is complete enough. Sanctions must be credibly enforced, which requires a social consensus either implicit in the case of social constraint or explicit for a platform. The following factors contribute to transactions taking place: (1) socially accepted environment; (2) sharing of data on the implementation of transactions; and (3) low likelihood of cheating which goes hand in hand with high enough sanctions when found cheating. When transactions are repeated in a similar environment, the environment will be more stable, even when the counterparties are not necessarily the same. Digital platforms provide efficient environments to address those needs.

These mechanisms need to be constantly updated and adapted. They often can be prey to gaming. The platform can offer biased outcomes of searches because its incentives become misaligned. Feedback mechanisms can be manipulated by both sides. For instance, in a two-way feedback, both agents can agree (even implicitly) on inflated rankings. Since both sides are unlikely to transact again, and if they do they have private information on the quality of the other side, they both have an interest to rank higher since they know there is no gain in deviating. Both sides can also explicitly re-negotiate *ex-post*.

Information systems put in place by the platform enable the ability to identify cheating while enforcement mechanisms can help to compensate losses. Platforms also create internal regulations and enforcement mechanisms that drastically reduce the likelihood of events that can lead to losses. For instance, ratings help ensure that a possible partner is reliable.

The transaction cost gains offered by digital platforms attract transactions that either could not take place or would take place through vertical integration or reselling. On top of offering lower transaction costs, platforms can rebalance these costs between the two sides and increase the volume of transactions.

In summary, a platform:

- Provides an environment (a market design) for transactions to take place;
- Provides savings on transaction costs;
- Is multisided with inherent externalities; and
- In order to cover costs and possibly make a profit, can earn revenues through membership and transaction based fees, and data services.

There are two direct consequences, relevant to any regulatory effort. First, the terms and conditions offered by platforms to one side are interdependent with those to other sides. The main competition parameters set for one side take into account conditions on all sides in order to maximize the platform's objectives. Since digital platforms internalize transaction costs, the platforms can rebalance the costs between the sides to a transaction and the data side. That also means that competitive conditions, including pressure from alternative platforms or offerings, on one side may constrain activities on another side. That makes more complex any assessment of market power or how to address a public policy issue.

Second, a digital platform must constantly adjust its conditions on each side to maximize its objective. Maximizing the presence of one side on the platform is worthless. Each side must be met in due proportion by users from the other sides. The dynamics can be particularly complex and subject to critical junctures. For instance, when a platform starts operating, because it is under financial constraints, it acts like a ship against the wind, seesawing its offering to ignite membership from all sides and use.[2] The dynamics can be symmetrical: a platform can lose what it gained with a spiraling effect. Two qualifiers, though. With size comes better information and better ability to meet the demand from various sides. Also, with size, the financial constraints can be loosened. Both aspects may better equip an established platform to fight against a downward spiral. It follows that barriers to entry possibly caused by network effects are affected by the intensity of the financial constraint and the quality advantage caused by size.

III. GREAT BENEFITS, AND GREAT DANGERS; BUT WHEN IS THERE A CASE FOR INTERVENTION?

A. Benefits and Dangers

Digital platforms have created opportunities to transact that did not exist before and today represent a significant part of our daily life and of global GDP. Among other factors, platforms provide a foundation of new social links, modes of transportation, access to information, and additional sources of revenue for citizens. In many ways, they are comparable to providers of club or public goods. They supply digital environments that address transaction costs, benefit to all, and are not exhausted by use. There are however saturation issues like limits on computation, bandwidth or negative network effects that limit attractiveness of a platform, which makes the platform more like a club good. And, obviously a platform objective is not necessarily to maximize welfare.

The daily drip of news is filled with reports on issues raised by, or attributed to, digital platforms. To quote only a few, they range from privacy issues, exclusion of businesses from ecosystems, spreading of prejudices, exploitation, to social exclusion. Criticisms brought against digital platforms trace their origins to three main trends.

First, platforms create private rules that regulate relationships among individuals or between individuals and firms instead, or on top, of public regulation. This causes a sense of unfairness for those who do not benefit from the same level of public regulation because their interaction is not caught by previous categorizations (for instance, what is the status of drivers in ride hailing applications) or from those who continue benefiting from protection from public regulation but cannot compete on a level playing field (like taxis).

Second, platforms bring drastic changes to economic and social relationships. They tend to create new types of communities with their rules, accepted norms and beliefs. By standardizing a number of transactions they amplify issues. This has positive effects by bringing greater numbers of people together but can also be very divisive and destabilizing for society. Think of the spreading of motivated reasoning, the echo chamber to social prejudices, the divisiveness of social media, the exclusion of those who do not belong, etc. On the economic front, digital platforms and their economics are changing the usual boundaries of firms; the nature of the relationship between employees/suppliers and firms; and spaces in which firms compete.

Finally, platforms raise new public policy issues. Those are intrinsically linked to the new role platforms play in digitizing society. Such new issues include protecting privacy, new systemic risks with intermediated assets, or new economic and social power based on big data and wider geographies than that of the regulator. As illustrated by the 2007 financial crisis, systemic risks are compounded when organizations self-regulate and there is limited supervision.

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2 Evans & Schmalensee, "Failure to Launch: Critical Mass in Platform Businesses," Review of Network Economics 9.4; 2010.

These trends pose direct challenges to the position of citizens and of regulators. Citizens are more and more defined by their private digital data, without necessarily controlling it or knowing its full extent. In parallel, regulators have to face a new reality made of prevalence of private regulation, international economic power and big data. That raises the question of how to adapt their regulations to both the new issues and the new environment.

B. What, When and How?

A regulatory setting typically includes an issue to address (what), a set of criteria to determine whether there is a need for regulation (when) and then a set of rules that should apply if the test is met (how and to whom). In the following I try to show what digital platforms change to the classic approach to regulation.

First, it is always sound to start by stressing the obvious: what issue? It could be a new issue created by a platform design like the spread of "fake news." More often it has been an existing issue but where the emergence of a platform makes past regulation obsolete like taxis and ride hailing. The issues for the initial regulation remain (say consumer protection, traffic, pollution), but the regulation must be redesigned. There is no reason to regulate platforms by default. An identified public policy issue must have emerged first. For many issues, the exercise is greatly facilitated by digital platforms' reliance on data. That allows testing possible issues ... if and when the data is available.

Analyses of possible negative effects of platforms share a similar pattern. They start from some anecdotal evidence that there is an issue (say racial discrimination out of rating system), then try to validate the existence of this issue through exhaustive data analysis, and finally make a recommendation to platforms: to test and adjust mechanism design according to some key public objectives to achieve (say redesign and test the rating mechanism so that racial discrimination is not facilitated by the system).

That does not mean intruding into the inner workings of the platform. For instance, a researcher in discrimination created by facial recognition systems states:

> I definitely understand companies want to keep their algorithms proprietary because that gives them a competitive advantage, and depending on the types of decisions that are being made and the country they are operating in, that can be protected. When you're dealing with deep neural networks that are not necessarily transparent in the first place, another way of being accountable is being transparent about the outcomes and about the bias it has been tested for. Others have been working on black box testing for automated decision-making systems. You can keep your secret sauce secret, but we need to know, given these inputs, whether there is any bias across gender, ethnicity in the decisions being made.[3]

This points to a recurring theme in AI, algorithms and Big Data: public policy (in that case, ethical) concerns and a level of transparency (accessible data) should be embedded in the development of those processes so that whenever there is an issue it can be debated and possibly addressed. That would bring two advantages: (1) identification could take place earlier than too late; and (2) corrective actions would likely be more proportionate and less disruptive to digital platform businesses.

That requires that the data be made available and somebody would be able to run the tests. Identification cannot be the role of the platform. Its incentives are not necessarily aligned with public interest. However, it should not be the sole role of a regulator (if one exists, has access to data and has the capability to conduct tests). But rather be open to "crowdsourcing" from the academics or the public. That requires some sort of obligation on platforms to be structured in such a way that they can make data available to regulators and for public debate. Such data would cover, for instance, outcomes when testing how the platform functions against a public interest objective.

Second, once an issue has been identified, when to intervene? For some of the businesses operated by digital platforms (like ride hailing) or for some of the issues (like privacy), there is a regulatory setting already in place. For many, if not most, there is none. In that case, the examination of issues is forced into pre-existing regulatory settings that may include competition laws. Competition law applies to anticompetitive conduct but as opposed to other industries, it is not clear that findings of market power should be a starting point for imposing regulatory obligations. For telecoms or energy, the European change to the regulatory regime saw the industry open to competition while regulation was imposed to make sure that the benefits of competition be passed on to consumers. In those cases, there were natural monopolies that gave rise to market power that could be leveraged in various ways. Issues arose notably because of the need to access the natural monopoly. Market

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3 Tucker, "'A white mask worked better': why algorithms are not colour blind," *The Guardian*, May 28, 2017.

power was used as a natural proxy for the need for regulation. In addition, sufficient levels of competition could discipline incentives to lower quality of services offered to customers.

For digital platforms, the picture is radically different. To begin with, issues of market power are less clear cut. There is no natural monopoly, but positions of power that have been built in and are often transitory. They originate in barriers to entry created by data and financial constraints, algorithms and IP. It is not inconceivable that the dynamics of multisided markets may undo them. Granted, some platforms have created their own ecosystems where third parties develop applications (platforms) that run on top of the platform. There might be issues of access or exclusion through vertical integration that competition law would have to deal with. Market power is also more complicated to find in multisided markets. For instance, a platform may be disciplined on one side through a competitive constraint on another side. The constraint may come from a competitive data side like advertisers (think of the effect of recent boycotts on YouTube policies) or a binding outside option on the supply or demand transaction sides. Moreover, disciplinary effects of competition on non-price factors may not be very strong. Platforms tend to differentiate their transaction offerings in order to maximize their volume of usage. And, non-price factors are not always visible.

It follows that market power is probably a poor proxy for intervention. Even without market power, public policy issues may emerge out of the operation of platforms. Market forces may not be effective to discipline platforms on public policy issues, and therefore regulation should be considered when serious issues are objectively identified.

Third, when considering platforms, regulation should acknowledge that they are market designers and that they run on the basis of and produce data. That should enable smart regulation. This is what I call a data savvy regulation. Regulation should apply to platforms as subjects. Platforms dynamically evolve. A regulatory shock can generate negative dynamics either in favor of alternative platforms or of other forms of organization such as vertical integration or reselling. If the platform has the discretion of allocating the sharing of the increase in costs, it will choose the profit maximizing one. If instead the regulator imposes the obligation on one side, the platform could still do some rebalancing but the social cost of monitoring the implementation by users would likely be much larger than if taken over by the platform. A platform has potentially the infrastructure and data required to check implementation, can allocate responsibilities and can address many of the principal – agent issues that would plague a regulator – user relationship. In addition, the platform may have a higher incentive to achieve implementation of the obligation since its reputation has a high value.

That has implications for the architecture of platforms. Code is regulation as Lessig declared back in 1999[4] but the converse is also true. The design choices when developing a platform have direct consequences on the way it can regulate the matching it enables and on the issues it may give rise to. Implementing a regulatory obligation can be very expensive and disrupting if the regulation and the platform design are not consistent with one another. There are interesting parallels with the finance industry where financial companies structure the market through their common choices for a number of financial markets. Regulators have to then make a choice between abiding by the structure and then "trust" platforms (banks) or imposing structural changes (like what followed the 2007 financial crisis and its aftermath). Ideally, public policy issues should be known beforehand so that when a platform is built and expands, it does so in a way that would allow regulatory testing and action.

As for the financial industry, the best cure is probably not to prescribe a mode of organization but rather some degree of transparency on the resilience of platforms *vis-à-vis* pre-determined public objectives. That could take the form of access to data and of simulations to satisfy compliance to some predefined standards.

The intensity of involvement of the regulator should depend on the nature of the issue. As a private regulator, the platform is best placed to address an issue that negatively affects its users within its operation, under supervision by the regulator. In that case, it is only an extension of existing processes. Think of non-discrimination between hosts and guests on an accommodation application. The regulator then must make sure to provide incentives that processes are put in place and that observable and verifiable data is available to monitor compliance. Coordination between the user and the regulator will help ensure compliance by the platform. This is of paramount importance for issues that negatively affect the interests of the platform, like, say, privacy issues. Finally, for issues that affect a population broader than only users (say air pollution for ride hailing), the regulator may have to be involved in a more intrusive way.

When a public objective has been assigned to a platform, regulators should not just sit happily waiting for the platform to exert self-regulation prowess. By definition, if a regulator had to intervene, there was no self-interest for the platform to implement those objectives in the first place. This creates an incentive for it to cheat. On top of that, the regulator's diagnostic and cure depend largely on the data it received from the

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4 Lessig, "Code and Other Laws of Cyberspace," Basic Books, 1999.

platform. This raises the question of the representativeness and overall quality of the data. Since most often the public policy at stake is impacted by the usage of the platform, which points to the importance of defining the information that is generated by a user. There is a strong intersection with privacy issues in that regard.

For a system to be regulatory friendly with platforms, information must be made public, not private. That applies to the analysis of outcomes with the platform's data but also to findings made by platforms. Since they are so heavily based on trust. This touches on another danger of regulating sophisticated or black box animals: if the regulator has to understand the inner functioning of the business, it will fail. The degree of complexity is now too high. Think of the self-attainment of objectives by banks until the 2007 crisis under their regulatory regime at the time. Such an approach is only tenable if information is freely available. For instance, Uber has agreed to provide New York City with data but that data is kept confidential.

IV. CONCLUSION

This discussion points to a prerequisite for any regulatory regime: openly test the issue, use the platform data, make outcomes public to allow others to test ideas and adaptations, conduct experiments and use the collective intelligence instead of sticking to proprietary private data. Even though platforms are differentiated, allowing more competition should lead to more pressure on the non-price aspects of their operations out of which public policy issues may emerge. Nevertheless, the effects of competition on externalities generated by platforms can be ambiguous. One possible suggestion, in line with the European GDPR, would be to grant a right to their personal data (meant in an extensive way) to users: it would favor portability, emergence of alternative platforms, and allow easier testing.