The Economics of Platform Liability*

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Abstract

Public authorities in many jurisdictions are concerned about the proliferation of illegal content and products on online platforms. One often discussed solution is to make the platform liable for third parties' misconduct. In this paper, we first identify platform incentives to stop online misconduct absent liability. Then, we provide an economic appraisal of platform liability that highlights the effects of a stricter liability rule on several key variables such as prices, terms and conditions, business models, and investments. Specifically, we discuss the impact of the liability regime applying to online platforms on competition between them and the incentives of third parties relying on them. Finally, we analyze the potential costs and benefits of measures that have received much attention in recent policy discussions.

Keywords: Liability rules, online platforms, illegal content and products, intellectual property

JEL codes: K40, K42, K13, L22, L86.

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1. Introduction

Digitization has played a significant role in our economies over the last decades. In 2019, among the ten biggest companies worldwide, seven were operating in digital markets (Apple, Microsoft, Amazon.com, Alphabet, Facebook, Alibaba, and Tencent Holdings), mostly as online intermediaries. In Europe, recent statistics indicate that 7 out of 10 consumers ordered online goods in 2019, sustaining a steady increase in the number of online transactions.[1] Such numbers are likely to increase in the next years, following the COVID-19 outbreak which spurred, even more, the use of online services for basic needs. Similarly, the share of individuals using hosting platforms such as social networks reached more than 56% in the European Union in 2018.[2]

As some of the firms' and consumers' fundamental activities have moved online (such as shopping, socialization, and content consumption), online misconduct has proliferated too, taking different forms. For example, in e-commerce platforms, illegal activities consist in the sale of counterfeit goods, which violate intellectual property (IP) and harm right holders. Due to the market reach of some big platforms, it is not surprising that OECD (2018) referred to e-commerce platforms as "ideal storefronts for counterfeits". In hosting, messaging, and video-sharing platforms, online misconduct occurs via the presence of illegal material, such as child pornography and terrorist propaganda, or the illegal distribution of copyrighted content. The presence of this material in social media platforms is further exacerbated by the large-scale production and diffusion of user-generated content that features hate speech and questionable material and might create societal externalities. The tragic events in Capitol Hill in January 2021, for instance, were mostly organized on social media sites, Gab and Parler, with no moderation of content.[3]

Yet, preventing online misconduct can be challenging in practice, and requires substantial resources, including a combination of state-of-the-art technology for machine detection and human moderators. Moreover, striking the right balance with fundamental freedoms such as the freedom of speech is a difficult task (see e.g., the First Amendment in the US). This study aims to investigate the incentives of online platforms to mitigate or stop online misconduct in a *laissez-faire* regime, and how changes in liability rules might alter these incentives and affect platforms' key strategic variables. This is relevant as the current liability regimes - for example, the Section 230 of the Communications Decency Act in the US and the e-Commerce Directive (2000/31/EC) in the European Union - have been considered outdated and proposals were recently made. For example, the European Commission has unveiled its proposal for the *Digital Services Act,* which continues to ensure conditional liability exemption to online intermediaries but introduces a differential system with some additional procedural obligations to "very large" platforms[4]. In the UK, the Government proposed the Online Safety Bill imposing a duty

[1] Eurostat 2019. Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=E-commerce_statistics_for_individuals#General_overview

[2] Statista 2018. Source: ttps://www.statista.com/statistics/276767/social-network-usage-penetration-of-european-populations/

[3] See The New York Times 'The storming of Capitol Hill was organized on social media.' January 6, 2021. https://www.nytimes.com/2021/01/06/us/politics/protesters-storm-capitol-hill-building.html

[4] See Digital Services Act https://ec.europa.eu/digital-single-market/en/digital-services-act-package.

of care on digital services providers.[5] Stricter liability rules have instead been proposed in the California Assembly in February 2021 for intermediaries selling defective products.[6]

The current liability regimes, which were designed in 1996 in the U.S. and 2000 in the EU, were established to help "information society services" to grow and protect them from endless litigation. However, in the last twenty years, the platform economy has become very diversified, including the appearance of new business models and new types of activities that were not available in the early 2000s. In most cases, online platforms adopt a multi-sided approach, intermediating interactions among several groups of agents who can be exposed or expose others to risks. Moreover, due to the global reach of some intermediation services, for a victim, claiming damage for harm that occurred online can be difficult, if not impossible, thereby increasing the risk that a large number of victims would remain uncompensated for any damage they receive. Similarly, new types of harms have emerged or become more pervasive than in the past. For instance, hate speech has become a major problem because of the large negative externalities that it can impose on vulnerable individuals or groups that may not be part of the platform environment. Moreover, harmful content can become easily viral thanks to groups, algorithms, and recommender systems. On top of these aspects, some platforms have become very large, have deep pockets, and are in the technological position to withhold support to users (or sellers) involved in online misconduct. Turning again on the events of Capitol Hill in 2021, coordinated action of Google, Apple, and Amazon withheld support to Parler in their app stores and hosting environment, respectively.

Against this background, this paper provides a novel analysis of the incentives of online platforms to engage in self-regulatory conduct and the economic effects of introducing more stringent platform liability. We restrict attention to the following types of online misconduct: (i) the presence of counterfeits on e-commerce websites and the related violation of intellectual property rights, (ii) copyright infringement on hosting platforms, (iii) hate speech, child pornography, and other unlawful materials (which may depend on specific national legislations) hosted on online intermediaries. We focus mostly on e-commerce platforms, social networks, and hosting platforms, and we highlight the direct and indirect benefits and costs associated with the imposition of a stricter liability regime. Our analysis identifies the interdependence of incentives across different players and suggests that a change in the liability system is likely to affect *inter alia* the pricing strategies of the platforms, the level of participation in their activities, their business models, their terms and conditions, as well as their investments. Understanding these effects is necessary to design appropriate liability rules and possible exemptions.

Our paper is related to the economic literature on liability. This literature has mostly focused on the liability regime that applies to *producers* of a given good,[7] and has analyzed, among others, the advantages and shortcomings of the so-called "strictly liability" and "negligence-based liability".[8] A notable exception is the study by Buiten et al. (2020) who examine liability rules for online hosting services from an economic and legal perspective and provide policy recommendations for a liability regime in the European Union. These authors identify several problems in the current liability

[5] See The UK Draft Online Safety Bill. https://www.gov.uk/government/publications/draft-online-safety-bill
[6] See California Assembly Bill https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1182
[7] See e.g. Daughtey and Reinganum (2013) and the other papers discussed in Section 2.
[8] These two liability regimes are defined and discussed in Section 2.

framework for online intermediaries in the European Union. Above all, they consider that the absence of the so-called "Good Samaritan" protection in the EU e-Commerce Directive is highly problematic. The "Good Samaritan" clause grants liability exemption from any action voluntarily taken in good faith to restrict access to obscene, lewd, lascivious, filthy, excessively violent, harassing, or otherwise objectionable material. Such a clause is explicitly mentioned in the US Section 230(c)(2) of the Communications Decency Act. Yet, its absence in the current EU liability framework creates perverse incentives for platforms not to monitor online activity, thus undermining self-regulation. Buiten et al. (2020) also argue that responsibility should be shared among all the parties involved in the diffusion of illegal online material, and that the liability rule applying to online platforms should be principles-based and supplemented by co-regulation or self-regulation. Our paper complements theirs by discussing further how more stringent liability rules might alter platform incentives along several dimensions in the short, medium, and long run, and analyzing specific aspects of a liability regime that have received much attention in recent policy discussions.

The outline of the paper is as follows. In Section 2, we briefly discuss the relevant literature on liability in "traditional" markets, i.e., markets in which no intermediation takes place. In Section 3, we discuss the incentives of a platform to adopt self-regulation regardless of the imposition of a liability rule. In Section 4, we provide an economic analysis of platform liability highlighting its impact on several key economic variables. In Section 5, we analyze the implications of specific aspects of liability rules. Among these, we discuss upgrades of the current liability system which are conditional to a series of procedural obligations, such as those that increase transparency on platform activities regarding the removal of unlawful content or the design and implementation of review schemes. Similarly, as a one-size-fits-all liability regime might consolidate the market dominance of large platforms, we discuss some additional clauses that could apply solely to "big" platforms (e.g., those platforms with a large volume of sales or with a critical number of users). Finally, in Section 6, we summarize the main takeaways of our analysis.

2. Liability in traditional markets

In this section, we present some of the key results in the literature on liability in "traditional" markets, in which firms sell their products to consumers *directly*. From an economic perspective, a necessary condition for liability to be socially desirable is that firms' private incentives to engage in care or precaution in order to reduce the potential harm caused by their product(s) are not aligned with the interests of society.

To start with, consider an idealized model, as proposed by Daughety and Reinganum (2013) where private and social incentives are fully aligned. The firm's optimal level of care minimizes the "full marginal cost" it faces, i.e. the sum of its marginal cost of production (including the cost of care), the expected compensation the firm needs to pay to harmed consumers per unit consumed if the firm is held liable, its expected per-unit litigation costs, *and* the expected uncompensated loss to the consumer per unit consumed.[9] When deciding on its level of care, the firm internalizes all the costs

[9] The consumer's expected uncompensated harm reflects the fact that the consumer may not be fully compensated for the harm and might also bear (at least part of) its litigation costs when the firm is liable.

borne by society and thus it behaves like a *benevolent* planner that maximizes social welfare. Imposing liability on the firm in these circumstances could reduce social welfare by generating costly litigation that would have been avoided in the absence of liability.

However, there are reasons for liability to be socially desirable, and these are associated with the presence of one or several market failures. Consider, for instance, a scenario with *asymmetric information* between the firm and consumers, with the latter not being able to observe the level of care chosen by the former. In that case, the demand the firm receives will be independent of the actual level of care it takes; rather, it will depend on the consumer's *conjectured* care level. Absent liability, the firm is not rewarded for taking more care and, in turn, it will choose the minimal care level. A similar argument applies to the presence of a *third party* not participating in the transaction but who could potentially be harmed. In this case, imposing liability on the firm may be socially desirable, as the firm does not take account of the negative externality it exerts on the third party when choosing its level of care.

Another market failure that could also make it desirable to introduce some form of liability is *market power*. Hua and Spier (2020) illustrate it in a model wherein a monopolist sells a potentially dangerous product to a set of heterogeneous consumers who are fully informed about the level of product safety. In their model, absent liability, the private and social incentives to invest in product safety are not aligned. The reason is that the firm cares about the "marginal consumer", while a social planner that maximizes social welfare cares about the "average consumer". Thus, making the firm subject to some form of liability might help to mitigate the divergence between the private and social incentives for product safety by giving the firm's incentives to invest more in product safety.[10]

The discussion above suggests that, under a wide range of circumstances, imposing liability on firms (or making them subject to a stricter liability regime) can be an effective way of bringing their private incentives for care into alignment with society's interests. However, this benefit must be weighed against the potential costs associated with the existence and the level of liability. The most straightforward cost resulting from the imposition of liability on firms is an increase in litigation as harmed parties may disagree with the firm about the level of compensation they are entitled to.

However, other indirect costs might be present. For example, the imposition of, or an increase in, liability leads to an increase in the firm's full marginal cost because the firm may face litigation more often, which may increase its litigation costs as well as the compensatory transfers it makes to harmed parties. In turn, this affects not only the level of care chosen by the firm but also the firm's level of activity. One might easily expect an increase in the full marginal cost to be passed on, at least partially, to consumers, which would lead to higher prices and lower output. This is a *supply-driven effect*. Similarly, more liability may also allow a firm to credibly commit *vis-à-vis* its customers to attain a certain level of care. In turn, a higher level of care might lead to a *demand-driven* increase in activity that could mitigate, or even outweigh, the negative supply-driven effect discussed previously.

[10] However, if the consumer's net benefit from consuming the product is decreasing in the consumer's type, then the reverse holds: the firm chooses a level of product safety that is too *high* from society's perspective. In that case, imposing liability on the firm would amplify the misalignment between the private and social incentives and would therefore be detrimental to social welfare.

The socially optimal liability rule that firms should be subject to depends on the magnitude of the costs and benefits of such liability for society. Different rules are typically present and hereby discussed. To provide a stylized representation of the different liability rules, consider a scenario in which a firm sells a product that may cause an accident to a consumer. Suppose now the victim sues the firm and asks for compensation. As already discussed, in a *no-liability regime,* the firm will not be held liable regardless of its care level and, hence, it will minimize its care effort, e.g., investments in product safety. *"Strict liability"* represents an extreme case of liability. Let us consider the previous example again and suppose the victim can sue the firm and ask for compensation. Under this rule, the firm/injurer would have to bear the full cost of compensating the consumer regardless of the level of care undertaken. As consumers know that they would be compensated in case an accident occurs, they will not have any (monetary) incentive in taking precautionary actions themselves. By contrast, it is in the interest of the firm to avoid compensating the consumers and paying the related litigation costs by minimizing ex ante the risks of accidents. Naturally, this suggests that strict liability ensures a high level of care and precaution by firms, but this does not suffice to state that strict liability is socially desirable as its benefits for society should be weighed against its costs.[11]

Different shades of liability exist between the two regimes we just discussed. A relevant one is the so-called "*negligence-based rule*". According to this regime, a firm causing an accident is considered liable only if not ensuring "duty of care". From an economic perspective, the duty of care represents legal obligations or precautionary actions (level of care) that would maximize social welfare. However, a negligence rule raises practical issues that do not arise under the two extreme rules of no liability and strict liability. First, it presumes the definition of a legal standard of care (reasonable care), which can sometimes be challenging to identify on a case-by-case basis. Second, the injured party must prove that the defendant failed to take a reasonable level of care and this caused harm to the injured party.

The above discussion considered liability rules that apply to *direct* wrongdoers. However, it might also be optimal to impose liability on *indirect* wrongdoers, as illustrated by Hay and Spier (2005). These authors study a perfectly competitive market supplying a product that can ultimately cause harm and both the manufacturer and consumers can take some costly effort to prevent downsides. When consumers have deep pockets (i.e., are fully solvent), imposing liability on consumers is efficient as they can pay for any damage they generate as well as take the optimal level of care. On the contrary, when consumers do not have deep pockets, they bear less than total responsibility for any harm they cause. It is therefore efficient to maintain primary liability on consumers and complement it with residual liability on the manufacturer. The possibility to pay for risky behaviors by consumers creates the incentives for the manufacturer to invest in safer products.[12]

[11]The rationale for a liability regime has been deeply criticized by some authors, such as Polinksy and Shavell (2010). In their article, the authors argued that product liability might not be socially desirable if market forces and regulation already provide incentives for firms to invest in safer products. In these circumstances, adding product liability would increase only marginally the net benefit from product liability (as higher liability also implies higher price for consumers) and these gains may even be outweighed by litigation and liability-related costs. The central argument is rooted in the idea that when market forces work and consumers can infer product risks, firms selling unsafe products will be then punished by the market. For a reply to Polinsky and Shavell (2010), see Goldberg and Zipursky (2010).

[12] These results broadly apply if consumers are homogenous but, with heterogeneous consumers, the introduction of residual liability can lead to unintended effects.

This example suggests that liability can also be introduced to induce some agents to take actions that stop or mitigate the harmful conduct of other players. The setting we have discussed is quite traditional, rooted around the bilateral relationship between buyers and sellers. In markets featuring the presence of online intermediaries, a prominent role can be played by the platform's owner. This is especially true if direct enforcement of primary liability becomes too expensive (e.g., millions of buyers and sellers in a marketplace). One possible way to deal with this problem is to impose liability on *the* party that can help to prevent an accident or, in the case of illegal activities, misconduct. The law and economics literature has referred generally to these cases as *secondary, indirect,* or *collateral* liability. Most relevant for our analysis is the notion of "*gatekeeper liability"* (Kraakman 1986). This is a special case of liability imposed on intermediaries whose characteristics and role enable them to disrupt misconduct by "withholding support" and prevent any infringement. Undoubtedly, platforms are nowadays key players that have developed tools and capabilities to monitor, identify, and to some extent, mitigate illegal activities and misconduct in their ecosystem.[13] Moreover, introducing liability for intermediaries might lead to a considerable reduction in enforcement costs. In a similar vein, Landes and Lichtman (2003) discussed whether a manufacturer producing a decoder box should be held liable for third parties' infringements of copyright. According to the authors, holding the manufacturer liable would result in substantial enforcement and administrative savings for the harmed party, which would therefore directly sue the manufacturer rather than multiple infringers.[14]

3. Platform incentives and self-regulation

Before discussing the platform's incentives to engage in forms of self-regulation, even in the absence of liability ("laissez-faire" regime), it is convenient to introduce some terminology for the key elements that distinguish online intermediaries. A key feature of most online intermediaries is the presence of within-group and/or cross-group network externalities. Within-group network externalities are generated from the activity of other peers belonging to the same side of the market. For example, in social media platforms, users typically benefit from other users' participation in the platform environment (e.g., social interactions, user-generated content, data-enabled learning). Cross-group network externalities arise when agents gain or lose from the interactions with agents belonging to a different side of the market, thus rendering the market multi-sided (Armstrong 2006; Caillaud and Jullien 2003; Rochet and Tirole 2003).

Platforms can use various pricing instruments for the agents on the platform. *Membership fees* refer to a pricing structure in which the platform charges users (or a subset of users) for their participation

[13] In 2020, the California Court of Appeal court, *Bolger vs. Amazon* found Amazon liable for the injuries caused by an unsafe product (i.e., laptop battery) sold on the marketplace by a third-party seller. The ruling noted the following « Amazon is a direct link in the chain of distribution, acting as a powerful intermediary between the third-party seller and the consumer. Amazon is the only member of the enterprise reasonably available to an injured consumer in some cases, it plays a substantial part in ensuring the products listed on its website are safe, it can and does exert pressure on upstream distributors [..] to enhance safety, and it has the ability to adjust the cost of liability between itself and its third-party sellers. Under established principles of strict liability, Amazon should be held liable if a product sold through its website turns out to be defective. » (p.4)

[14] The authors also distinguish between vicarious and contributory liability. The former case identifies when – using our framework – the platform has control over the infringers whereas in the latter the platform only develops knowledge of the infringement made by third parties. The authors argue that contributory liability is more likely to be desirable the larger the harm caused by the infringers as well as the larger the reduction in enforcement cost compared to a system with direct liability only.

in the platform environment. Such a price is levied irrespective of the level of the activity carried out on the platform. In contrast, *fixed transaction fees* refer to an amount paid by one or both sides each time a transaction occurs, e.g., a product is sold, or a user receives a targeted ad. Finally, *ad-valorem fees* refer to those transaction fees levied on one side of the market that are proportional to the value of the transaction.[15]

Platform incentives

We can now discuss the incentives of a platform in the absence of liability. Let us abstract from any reputational damage that can be borne by the platform because of online misconduct. If the platform does not take into account any reputational loss, its incentives will fundamentally depend on whether any participant in the platform environment is harmed by the online misconduct. As the type of harm differs significantly across platforms, we discuss various examples.

Consider an e-commerce platform allowing interactions between sellers and buyers. Suppose the platform adopts an 'open business model' for which any seller can join the platform and offer its product(s). Suppose further that in each product category there are original products and counterfeits, the latter being unsafe or manifestly different from the prior of the consumers. In these circumstances, if the platform expects to have repeated interactions with the consumers, it might have ex-ante incentives to police its environment and therefore engage in stricter screening policies. However, these incentives might not arise in the presence of one-off purchases.

Suppose now that the types of counterfeits available on the platform are benign, that is, they are safe for the consumers but still infringing IP rights. An example can be the (illicit) imitation of a branded pair of shoes. Suppose that consumers can distinguish between high-quality branded products and low-quality imitations and that some consumers have a taste for the latter, which can be attractive because of their low price. In this case, any transaction does not lower – but rather increases – buyer surplus, and the only harmed party is the brand owner who may suffer from missed sales. If the brand owner participates in the marketplace and ensures a large volume of sales, the platform might have an incentive to protect its sales and remove the illicit versions, regardless of the liability regime. On the contrary, if the platform can expand its market reach by admitting some low-quality products, even though infringing IP rights, then it might not have incentives to delist the infringers. Note that the above discussion abstracts from the presence of screening and filtering costs, which can be quite substantial and limit self-regulatory conduct.

Consider now an ad-funded hosting platform on which viewers can enjoy user-uploaded content. Even absent any liability, a platform might prefer to engage in moderation of harmful content if both viewers and advertisers prefer content to be moderated. This is the case, for example, of hosting platforms that are tailored to family audiences, that attract indeed a quite sensitive customer base and a group of advertisers that demand strict terms and conditions to place their ads. For example, a

[15] For example, Apple charges developers a commission fee of 15-30% for in-app transactions. Yet, it is important to note that some platforms adopt a mixture of the above-described fees. For example, abstracting from fulfillment and sponsorship fees, Amazon charges a 'referral' (ad valorem) fee per item sold, which depends on the product category. A typical fee ranges between 8% and 15%, with a minimum of 0.30$. On top of these fees, Amazon charges a membership fee amounting to 39.99$ per month to 'professional sellers' or, alternatively a transaction fee of $ 0.99 per item sold to 'individuals' selling fewer than 40 units per month.

major concern for advertisers is their "brand safety", which can be defined as the harm caused to brands when their ads are displayed in unsuitable or harmful environments. [16]

Finally, consider a social media platform. One of the most illicit crimes conducted online relates to hate speech. This crime concerns the production of user-generated content from one of the members of the hosting community, which can create damage to another person or group based on race, religion, sex, or sexual orientation.[17] In social media platforms, hate speech can be quite common. As a tiny minority of users produces hate speech, the platform might have an incentive to monitor their presence and exclude them if moderation costs are not too high and hate speech has a negative effect on user participation.

Another reason for why a platform might decide to police its ecosystem is to control seller competition and align sellers' interests to its own. It is often the case that platforms set quality standards and safety requirements to control/limit the entry of third parties and manipulate on-platform competition.[18] For example, Apple uses its Safety Review to screen out dubious mobile apps. In this sense, screening and platform curation represent another tool for the platform to design and regulate its ecosystem alongside commission rates. Yet, as discussed by Teh (2020) in his work on platform governance, these quality controls might be too restrictive or too permissive compared to those that would be socially desirable.

Asymmetric information, reputation, and rating systems

In the previous section, we have discussed that liability in traditional markets can be desirable to address asymmetric information. In a digitized world, platforms have powerful incentives and tools to mitigate asymmetric information, which might make liability less useful in this respect. Platform business models succeed when stimulating the participation of different agents, and this participation implies not only the number of sellers and buyers but also their quality. This allows platforms to build a somewhat collective reputation. If many sellers joining a platform start offering low-quality or fake products and buyers do not enjoy these products, then the reputation of the platform might be adversely impacted. As a result, the strength of the network externalities would be reduced (Belleflamme and Peitz 2018), and buyers would prefer to purchase on different platforms, offline, or directly from the retailer websites. Given this threat, platforms have incentives to act as regulators on their own space to build and maintain reputation. For example, favorable return policies can help to

[16] For a recent study on the incentives of platforms to invest in content moderation and safeguarding advertisers, see e.g. Madio and Quinn (2021). The authors found a social media platform increases its content moderation effort whenever advertisers' sensitiveness to brand risk increases and moderation costs are not sufficiently large.

[17] For example, a major case of hate speech towards a group has concerned the Rohingya minority in Myanmar. According to the UN investigator, the adoption and use of Facebook may have played a role in spreading acrimony, dissension, and violence See e.g. https://www.theguardian.com/technology/2018/mar/13/myanmar-un-blames-facebook-for-spreading-hatred-of-rohingya

[18] Note that also admitting sellers with dubious quality can affect competition in a way that is beneficial to the platform. Casner (2020) shows that a platform might have incentives to admit on the platform low-quality sellers to increase search costs and hence soften competition. Having a lax screening policy is profitable for the platform if increasing screening costs, by letting consumers search more because of the presence of low-quality sellers, more than compensates for the reduction in consumers' willingness to pay caused by a lower expected quality of the products. These two countervailing effects are referred to as the "obfuscation effect" and the "lemon effect", respectively.

verify whether buyers' prior expectations are consistent with the post-purchase realization and mitigate problems of asymmetric information. [19]

Online intermediation can help to further mitigate asymmetric information by providing review and rating schemes. Several studies have demonstrated the welfare gains associated with online reviews (e.g., Reimers and Waldfogel 2021) and their economic impact has been largely discussed in the economic literature (for a survey, see e.g., Belleflamme and Peitz 2018; 2020). Reviews and ratings are user-generated information that are available pre-purchase to potential new buyers and help to shape their expectations regarding quality, safety, and other characteristics.

The presence of reviews is also an important proxy of a seller's activity in the marketplace and this can represent relevant information for the buyer.[20] If reviews are effective in mitigating the problem of unobservability of product characteristics and let consumers identify unsafe products, then the introduction of liability might not necessary to mitigate asymmetric information.[21] Yet, not all buyers might pay attention to reviews. In addition, reviews might suffer from several issues related to asymmetric herding behavior, idiosyncratic tastes, or strategically distorted ratings (Belleflamme and Peitz 2018), or simply being fakes. [22] In the latter cases, the mere presence of a review system might not be enough to address the asymmetric information problem.

Private vs. socially desirable incentives

As discussed previously, a platform might have incentives to intervene in its ecosystem to preserve its reputation, to anticipate regulatory changes, or to preserve the strength and the quality of the network externalities it creates. However, its incentives are likely to be different from those of the social planner as a platform only cares about all (potential) users it can reach while the social planner also cares about the externalities exerted on players not active on the platform. In other words, the negative externalities for parties that are extraneous to the platform are not internalized by the platform when deciding its terms and conditions or screening policy, which implies that the platform incentives to attain a certain level of care might be lower than would be socially desirable, keeping other things equal. Examples can be right holders that do not participate in the platform environment and observe their products being imitated illegally online, or individuals that do not use the platform but are harmed by hate speech produced by its users.

[19] For instance, the platform Zalando has an unusual 100-day return policy, which is well beyond the 14-day return policy prescribed by the EU law. Note however that this can give rise to moral hazard as consumers might buy more than what needed, experience goods, and return the products to the warehouse.

[20] The fundamental impact of reviews and rating systems emerges prominently in the dark-net wherein digital platforms, reachable only through the TOR anonymous system, let vendors and buyers transact all types of illegal content and products.

[21] Note that effective rating systems might also help to discipline sellers because of reputation concerns (see Cabral and Hortacsu 2010).

[22] Fake reviews include reviews generated voluntarily or based on payment with the goal to orient consumers' beliefs over a product or content. These can be reviews opportunistically designed to inflate a seller's rating or reduce a competitor's score, and are widespread in online markets (see Mayzlin et al. 2014 for Tripadvisor and He et al. 2020 for Amazon). In 2021, Amazon expelled prominent sellers from its marketplace because of alleged fake reviews. See https://www.tomsguide.com/news/aukey-kicked-off-amazon-following-fake-reviews-allegations In June, the company release a statement clarifying its effort in preventing and removing fake and incentivized reviews in their ecosystem. See https://www.aboutamazon.com/news/how-amazon-works/creating-a-trustworthy-reviews-experience

Let us return to the example of an e-commerce website in which low- and high-quality sellers co-exist Suppose that low-quality products can infringe IP rights but do not cause harm to final buyers, who are willing to buy the low-quality version of a branded product. Suppose also that the platform earns most of its revenues from the sales of low-quality products, as these generate substantial market expansion. In these circumstances, removing these listings and expelling dubious sellers and IP-infringers might be too costly for the platform's owner and would reduce the platform's profit. Indeed, liability rules can make a difference and stricter liability may be required to align the platform owner's private incentives with what is socially desirable.

Furthermore, as discussed in Buiten et al. (2020), sellers might not have the incentive to exploit buyers in a platform environment if the risk of being expelled is high. Indeed, an e-commerce platform may have incentives to police the sellers even in the absence of liability because of the fear that buyers leave it and join competing marketplaces. However, that buyers' threat to move to competing platforms may not be credible in the presence of market power or lock-in effects. In this case, if network externalities are strong, an e-commerce platform acts as a unique gatekeeper *vis-à-vis* sellers. On the one hand, this puts the platform in a much stronger position *vis-à-vis* sellers willing to exploit consumers, given the lack of alternatives to the sellers. On the other hand, having achieved a critical size, a platform might not have a strong incentive to police the platform or to invest further resources on monitoring technologies and ex-ante verification of sellers.

Consider now a social media platform, wherein identifying victims can be challenging. As discussed already, the platform's owner might have incentives to protect its users. Yet, such an incentive can be much lower if the victims (and their peers) find it hard to leave the platform. This can be the case of dominant platforms that attract most of the users. The threat to move to a (smaller) rival platform might be particularly low in this case. Even in the presence of competing platforms of similar size, this threat might not be credible if users single-home -- i.e., patronize a single platform -- and there are high switching costs.[23] This is because abandoning the platform for another one would require coordination of their network, which is sometimes difficult in practice. Indeed, users might be *locked in*, and the incentive of the platforms would be lowered.

4. Effects of platform liability

We can now discuss the economic effects of a change in the liability regime. In what follows we will refer to *liability costs* as the sum of litigation costs, compensatory transfers, and the costs associated with precaution efforts. In addition, we will refer to *stricter* liability as the imposition of a liability regime that is less favorable to platforms and therefore implies higher liability costs. Hence, this does not necessarily imply a reference to the "strict liability" regime we have previously discussed and commonly adopted in the traditional law and economics literature.

Pricing strategies and level of activity

[23] However, as shown by Markovich and Yehekzel (2020), coordination might be possible if users can group together. For example, In January 2021, after policy changes announced by Whatsapp, Elon Musk and Edward Snowden tweeted in favor of Signal, a no-profit small rival, coordinating therefore users' switching to the platform.

First, we examine the impact of an increase in the liability applying to platforms on their pricing strategies and the level of activity in the different sides of the market. Our discussion of liability in traditional markets suggests that stricter liability may lead to higher prices and a lower level of activity. This insight carries over to platform markets in certain circumstances. To illustrate this, consider an e-commerce platform. Buyers benefit from finding more sellers on the platform – which increases variety – and sellers benefit from reaching more buyers on the platform as this increases the probability of finalized transactions. Suppose that the platform maximizes profits by charging a membership fee to sellers. If an increase in liability entails an increase in the marginal cost of scrutinizing sellers – e.g., acquiring documentation, verifying misuse of platform features such as sales rank, ratings, reviews, or general precautional activities – the platform will react by partly passing this cost onto sellers, thereby charging a higher membership fee. As a result, some sellers would find participation in the marketplace unprofitable and, hence, fewer sellers will join the platform. Given the multi-sided nature of the market, also fewer buyers will join the marketplace, again amplifying the loss for the platform and welfare.[24]

However, stricter liability does not necessarily lead to a reduction in the level of activity. To see why, consider now a scenario in which a platform sets a membership fee to both buyers and sellers. An increase in liability that makes it more costly for the platform to verify sellers' activity can again lead to an increase in the membership fee charged on this side of the market. However, the platform can now grant a discount to consumers to boost their participation and limit the exit of sellers from the market. In turn, depending on the strength of the network externalities, the number of consumers on the platform might even increase, thereby possibly compensating for the reduced activity of sellers on the platform.

This stylized discussion shows that the impact on the level of activity depends on the pricing instruments platforms use. A change in the liability regime may also affect the activity on a given platform through a change in the composition of platform users. To illustrate this, consider once again an e-commerce platform and assume that, for a given good, there are two types of sellers: those that offer genuine items and those that offer counterfeit items. Suppose that there is an increase in platform liability. *Ceteris paribus*, this should increase its incentives to verify the nature of items, which should reduce the number of sellers offering counterfeit items on the platform. This direct increase in the platform's incentive can be amplified or mitigated by an indirect effect stemming from whether buyers on the other side of the platform tend to value positively or negatively a decrease in sellers of counterfeit goods. In the former scenario, an increase in platform liability would increase the activity on the buyer side, which may, in turn, lead to an increase in legitimate activity on the seller side. However, in the latter case, the activity on the buyer side may decrease if platform liability increases.

[24] Note that here we focus on the "indirect" impact of a change in liability on the platform's activity. Specifically, we examine the effect on activity resulting from the changes in prices following an increase in the stringency of liability. However, even for fixed prices, the activity on the platform could change. Such a "direct" effect could be either positive or negative. To illustrate this, consider an e-commerce platform and assume that some of the goods sold on the platform are counterfeits. If buyers value negatively (resp. positively) the existence of counterfeits on the platform, applying a stricter liability regime will have a positive (resp. negatively) effect on the activity on the buyer side for a given level of the fees charged by the platform because buyers will expect a decrease in the number of counterfeits. Note also that, for illustrative purposes, we focus on a change in the liability regime that entails an increase in marginal costs. Depending on the type of platforms, a change in liability may also involve changes in fixed costs (e.g., investment in AI-based algorithms, better computing technology).

Finally, note that whether the change in the level of activity induced by a change in the liability regime is socially desirable or not depends on the type of considered activity and the extent of the harm resulting from illegal activities. To illustrate this, consider social media platforms, wherein users typically benefit from the production of user-generated content and the presence of peers. However, in some circumstances, user-generated content can be harmful. This is the case of hate speech, illegal videos, or user-uploaded content violating intellectual property rights, which can result in negative spillovers for individuals, groups of users, and – in some cases – advertisers. In this case, the effect of a change in the level of activity (resulting from a change in the liability regime) on social welfare depends on the extent of illegal content on that platform.

To understand further the impact of increased liability on the users of social media platforms, the activity on both sides of the platform, and social welfare, consider an advertising-funded platform. An increase in liability costs related to hate speech, for instance, would decrease the net expected value of an additional user on the platform. If advertising is perceived as a nuisance by consumers, then a decrease in consumer value will give the platform incentives to increase the level of advertising to which consumers are exposed, e.g., by offering more advertising slots per consumer or decreasing per-consumer advertising charges (everything else equal). This is again an indirect channel through which consumers could be negatively affected by a more stringent liability regime for platforms. This is, however, not the only effect at work as consumers may value the decrease in illegal content positively. In the latter case the *net effect* on their utility may be positive or negative depending on whether gains from content moderation more or less than compensates for the higher disutility that the presence of more ads entails.

Consider now the impact of a stricter liability regime for platforms on advertisers. As discussed before, this may give the platform incentives to decrease its per-consumer advertising charges because it has fewer incentives to "subsidize" consumers. Note, however, that if consumers benefit from the decrease in illegal content, their demand for the service offered by the platform may increase, which can lead to an increase in the (total) advertising price paid by each advertiser. Since this increase in the price would be driven by the rise in the number of consumers on the platform, advertisers could still be better off.

Business Models

In the medium and long run, platforms might strategically respond to a change in the liability regime by modifying their business model. Currently, some e-commerce platforms such as Amazon and the French chain Fnac adopt a hybrid business model featuring the presence of a marketplace, open to third party sellers, and direct involvement as re-sellers. In other words, there is a form of vertical integration. Being a re-seller, a marketplace, or a vertically integrated entity, matters for identifying the right trade-offs that an intermediary faces. According to Hagiu and Wright (2015),

"a fundamental distinction between marketplaces and re-sellers is the allocation of control rights between independent suppliers and the intermediary over noncontractible decisions (prices,

advertising, customer service, responsibility for order fulfillment, etc.) pertaining to the products being sold."

Overall, this distinction dates back to the different forms of organization and the role played by transaction costs (Williamson 1979). Importantly for our purpose, a pivotal aspect is the allocation of liability and its costs, which may affect a platform owner's choice of business model.

By intermediating transactions only, a platform has limited control over the product being sold, and monitoring and reporting tools can only mitigate the risk for users (in the case of unsafe products) and right-holders (in the case of IP infringements). Indeed, holding other things equal, an increase in liability leads to an increase in liability costs for the platform either in the form of precaution costs (ex-ante verification, ex-post monitoring, takedown) or in the form of litigation costs and post-sales compensation. Differently, by acting as a re-seller, a platform's owner can directly inspect and select the goods, verify their authenticity, acquire related certifications, and evaluate risks. It follows that, in response to a change in the liability regime, a platform's owner might shift its optimal intermediation mode towards a reselling activity in order to lower its liability costs.

In a more nuanced view, one way to shift a marketplace towards a vertically integrated mode is to increase the commission fees paid by independent sellers (who would then bear part of the increase in liability costs), which would lead to fewer sellers on the platform and would adversely affect both the variety and prices of goods. Indeed, all sellers - including the platform's reseller arm - will have an incentive to increase their prices because of the reduction in the number of competitors. This is further amplified by the fact that independent sellers will pass on at least part of the increase in their commissions to final consumers. Alternatively, the platform may engage in "self-preferencing" by making prominent, or generally favoring, its own products to the detriment of other third-party sellers. Whether such a practice might hurt consumers as well depends on the type and degree of competition occurring in the market and the cost of improving quality (De Cornière and Taylor 2019). Recent studies have already provided empirical evidence of the incentives of platform owners to enter the product space of their partners (for a review, see Zhu 2019) and these strategies have been regarded with concern and suspicion by policymakers and third parties (e.g., vendors). For example, Amazon already offers branded products on its marketplace and, in recent years, has consolidated its activity entering the product space of high-demand and popular sellers (Jiang et al. 2011; Zhu and Liu 2018). Increased liability might further strengthen this pattern and generate an entry into the product space of high-demand products for which the platform's owner is not able to acquire enough documentation and information. Recent theoretical papers offer contrasting insights about the social desirability of platform entry (Anderson and Bedre-Defolie 2021; Etro 2021; Hagiu et al. 2020; Tremblay 2020). In a very extreme case of strict liability, intermediation can posit too much risk and be extremely costly for the platform's owner, thereby leading small platforms to disappear and some others to consolidate their presence in a vertically integrated fashion.

The above discussion illustrates well the more general idea that an increase in platform liability may give e-commerce platforms incentives to increase their level of vertical integration. This is not only true regarding the owner of an e-commerce platform's decision to act as a reseller (or expand the activity of its reseller arm) but also holds for platforms' incentives to offer complementary products (which can be interpreted as another dimension of "vertical" integration).

To see why, let us consider the example of Amazon and focus on one of the complementary products that Amazon offers to its sellers, namely the Seller-Fulfilled Prime program, which allows sellers to fulfill orders with the same benefits as Amazon Prime. In this sense, the platform can be considered as an *active* service provider as compared to a *passive* marketplace that ensures mere intermediation.[25] Consider a liability regime in which a *passive* e-commerce platform that does not offer any complementary services is exempted from liability while an *active* platform that provides complementary services is liable. Consider now a change from this liability regime to one that eliminates this distinction, i.e., a platform can be held liable even if it is passive. Such a policy change would clearly provide the platform incentives to offer complementary services, which may or may not be beneficial to consumers. On the positive side, the fact that the platform offers complementary services mitigates the well-known double marginalization problem: unlike an independent provider of the complementary service, the platform internalizes the positive externality exerted by the complementary service on its primary activity and, therefore, tends to offer a lower price (and/or a higher quality) for that service. On the negative side, if the platform is dominant in its primary market, it might have the ability and incentives to foreclose its rivals in the market for the complementary service by engaging, for instance, in tying or bundling. If such a foreclosure strategy is implemented and successful, the price of the complementary service will tend to increase and/or its quality will tend to decrease. Still on the negative side, a platform might also respond to increased liability with a shift towards a business model in which a marketplace co-exists with the physical inspection of products and delivery. Hence, there will be more room for an ecosystem in which different activities co-exists and the market power of the platform vis-à-vis sellers increases.

One can note that such a shift in the types of activities carried out by the platform may lead to both the creation of a bottleneck and an increase in the costs faced by the sellers (which may then be passed onto consumers). Currently, sellers are free to decide whether to adhere to the fulfillment program run by the platform or to use their own logistics. Products are not inspected and verified, but sellers are required to maintain documentation and authorization. With stricter liability, an e-commerce platform might have an incentive to require sellers to join its fulfillment program to increase its control over the products they sell and reduce its liability costs. Moreover, the additional screening carried out by the platform might increase the fee sellers pay to be active on that platform. Let us suppose that the platform sets a per-transaction fee. Once again, depending on how the platform internalizes this additional cost, sellers may face an additional cost, which can either reduce their margins or lead to a further increase in the price paid by the buyers. In the first case, this can lead to fewer sellers willing to join the marketplace if their outside option (e.g., being active elsewhere, selling independently) is sufficiently attractive and, because of network externalities, fewer buyers as well. In the latter case, instead, if the final price paid by the buyer increases, this can result in fewer buyers willing to buy at such a price and, in turn, in fewer sellers active on the platform. In both cases, there would be less participation in the marketplace, which could reduce social welfare.

Let us finally discuss the way a more stringent liability regime might affect the business model of a social media platform offering advertising services. If such a platform is subject to stricter liability, it

[25] Such a distinction is particularly relevant in the European Union wherein, according to the eCommerce Directive, an active provider would not benefit from liability exemption, whereas a passive provider would be granted immunity.

may decide to take more control over the content of ads it shows to its users to decrease its liability costs. One (arguably extreme) way of achieving this is to stop outsourcing ad inventories to third party ad networks and become vertically integrated into the online advertising business.[26] While this may lead to technical efficiencies, it can also give rise to a conflict of interest, market power, and anti-competitive foreclosure (CMA 2019). Liability might further alter the incentives of the revenue model a social media platform adopts, inducing the latter to choose a subscription-based model rather than an advertising-based one. For example, Liu et al. (2021) present a model in which social media platforms are immune from liability, providing twofold results: if the platform finds it optimal not to moderate content, an ad-funded platform will have less extreme content than a subscription-based platform; on the contrary, if the platform finds it optimal to moderate content moderation, an advertising-based platform will lead to more extreme content under advertising. Although beyond the scope of their paper, one might conjecture that the introduction of a liability regime will induce a platform to moderate content and a strict liability regime might even induce the platform to select a subscription-based revenue (as better at maximizing profits, other things equal).

To see another potential effect of a change in the liability regime on the business model choice, consider the case of a media platform (such as YouTube) that offers both a basic ad-supported service that is offered for free to users and a premium service with a subscription charge but no advertising. If the platform considers that ads are potentially a major source of liability, it may rely more on the premium service and less on advertising to generate revenues. As a result, this may lead to a reduction in consumer welfare as users with a low willingness-to-pay for such a service may have no alternatives.

To sum up, a change in the liability regime applying to platforms may give them incentives to change their business model (either in an incremental or radical way) to reduce their liability costs. This change can be either beneficial or detrimental to consumers and social welfare depending on the precise circumstances.

Incumbency advantage

Some considerations can also be made on the interplay between liability rules and competition. As already discussed, liability regimes impact both the fixed and marginal costs a platform faces to operate in the market. The relatively lenient liability regime that online platforms have been subject to in the past years may have helped the existing platforms to grow as well as to become well-equipped and have the financial resources to comply with stricter liability than entrant platforms. For example, a hosting platform like YouTube developed a digital fingerprinting system called *Content ID*, able to identify violations of copyrighted materials. A social network like Facebook made investments in human and automatic, AI-based, content moderation to detect hate speech. A similar automatic detection of hate speech is widely used by its competitors (e.g., Twitter), whose AI searches out inappropriate content on the platform. An e-commerce website like Amazon experiencing the

[26] Such a practice is already quite widespread in the industry, and it may further be consolidated in case of stricter liability. For instance, according to the CMA (2019), "vertical integration has become the preferred method for rapid growth in the advertising industry. The largest companies are either acquiring smaller companies along the supply chain or building extensions of their own platform stack into new parts of the supply chain" (p. 199 para 5.184).

problem of illegal and counterfeit goods invested resources in its *Project Zero* to identify suspicious listings and detect illegal products automatically.[27]

The implementation of a more stringent *one-size-fits-all* liability regime for platforms might further amplify asymmetries in the market.[28] In other words, platforms of different sizes and competitive positions will not be affected equally by such a measure. Somewhat paradoxically, some of them may benefit from it. To see why, consider a competitive environment in which a big incumbent platform faces smaller potential entrants. A stringent one-size-fits-all liability regime increases the cost of entry and may result in the potential entrants deciding to stay out of the market, which would benefit the incumbent platform. Of course, this platform will also suffer from higher liability costs but this negative effect on its profit may well be outweighed by the positive effect resulting from the increase in entry barriers. This is to the detriment of market participants, who may face higher prices and fewer choices. An interesting analogy can be drawn with the implementation of the General Data Protection Regulation (GDPR) which may have helped big tech giants (Batikas et al. 2020; Gal and Aviv 2020; Johnson et al. 2021).

Another reason why some platforms may derive an advantage from being an incumbent is that they have accumulated huge amounts of user data which can be a valuable input for their monitoring and verification technologies. A general concern for competition policy is whether exclusive access to a vast amount of data can confer a competitive advantage in the market to provide consumer or users with better services, and in turn collect additional data (for a discussion on this feedback loop, see e.g., Biglaiser et al. 2019). A change towards a stricter liability regime adds another dimension to the data-driven competitive advantage of incumbents as these platforms can use past (user) data to better "train the algorithms" and reduce their liability costs relative to new entrants that simply lack these data. As a result, the incumbents would not only be more likely to provide better services and capitalize on this advantage but would be more compliant than their rivals, who might struggle to expand their level of activity. This advantage is amplified if the incumbent platform is "big" as the amount of data collected is typically proportional to the platform's activity, and/or if the new entrants are "small" as it would take them more time to collect enough data to have an effective monitoring technology. Indeed, stricter regulation on liability regimes in platform markets is likely to amplify current asymmetries between platforms at the benefit of incumbents.

We can then conclude that a one-size-fits-all liability rule for platforms risks undermining competition by inducing new barriers to entry and expansion in markets in which challenging an incumbent firm is already difficult because of the existence of network externalities.

Terms and conditions

A change in the liability regime applying to platforms is likely to affect not only their pricing strategies but also their terms and conditions. There are at least two ways through which this could happen. The first one is through privacy policy. To illustrate how, consider a platform that relies primarily on the collection and use of personal data for the monetization of the service it offers; in other words,

[27] According to Amazon, in 2020 its verification process stopped "6 million attempts to create a selling account before they were able to publish a single listing for sale." See Amazon Brand Protection Report, May 2021.
[28] Relatedly, Buiten et al. (2020) argue that a one-size-fits-all liability regimes may disproportionately burden small entrants.

customers pay the service with their personal data (which could be either used internally by the platform or shared with third parties). An increase in the stringency of the liability regime and the corresponding increase in liability-related costs could lead to an increase in data collection and use. This can be explained by the decrease in the net value attached to attracting an extra user and can be interpreted as an alternative way of passing on the increase in marginal costs resulting from a stricter liability regime to users.[29] Similarly, a platform may want to make its users liable for actions committed on the platform such as the uploading or production of harmful or illegal content. Stricter liability regimes may induce platforms to remove anonymity asking users to register with their ID cards or provide additional information. This might adversely affect consumer privacy as platforms may be tempted to monetize this information by sharing it with third parties.

The second channel through which a policy change regarding platform liability can affect platforms' terms and conditions is contractual liability. More precisely, a platform could design its terms and conditions in a way that "neutralizes", at least partially, its own liability *vis-à-vis* users. For instance, an e-commerce platform may ask buyers to waive their right to sue the platform if they buy a counterfeit product on the platform (assuming this is forbidden by neither the laws governing platform liability nor consumer protection law).[30] Note, however, that contractual liability terms cannot protect a platform against harmed parties that are not users of the platform, as is the case for intellectual property holders in the case of counterfeit products and copyright, and individuals harmed by hate speech. Moreover, even if the platform has the ability to impose a contractual clause that makes the seller the sole liable party, it may not have the incentive to do so if it expects such a clause to reduce the attractiveness of the platform relative to other distribution channels (including competing platforms) in a significant way.

Platforms' investments

A policy change regarding platform liability is likely to have an impact on platforms' investments in several areas. In e-commerce platforms, for example, imposing or inducing a more stringent screening policy because of a stricter liability regime might impact the ex-ante incentives of brand owners to develop new products. To understand how, suppose that brand owners make their investment decisions to develop a new product upon observing the platform's screening policy. If brand owners expect to face competition from IP-infringers (e.g., counterfeiters), their strategies might change accordingly. The most obvious effect is that brand owners will reduce their ex-ante investment effort given the ex-post costs and harm they would face when competing with IP-infringers or flagging these products. In this case, introducing a stricter liability rule might sustain brand owners' investment incentives.

However, things might be different if, for example, the presence of IP-infringers that do not cause harm to consumers turns out to increase the value of the platform and attract more buyers. In this

[29] Note that in this case, the introduction of a liability rule that leads to a higher intensity of content moderation may not necessarily be welfare-enhancing. Stricter content moderation is likely to be socially desirable if the direct gains on the user side from moderation offset the negative effects of the increase in data collection.

[30] Choi and Spier (2014) provide a rationale for prohibiting waivers of product liability.

case, it is not a priori clear that brand owners would prefer a more stringent liability policy as a demand expansion effect should be weighed against the direct harm suffered by the brand owners.

Another important effect of introducing liability is on investments in *ex-ante* verification and *ex-post* monitoring, reporting and removal tools that allow a given platform to take precautions and possibly comply with the conditions for a liability exemption (if such an exemption regime is available). A more stringent liability regime gives the platform stronger incentives to prevent harm and, therefore, may spur its investments in the adoption of technologies that aim at deterring platform users from engaging in illegal activities for which the platform is liable.[31] Moreover, stricter liability may also increase the platform's incentives to invest in tools that help it and/or harmed users to identify primary wrongdoers as this may reduce the cost of compensating harmed parties (in case the several-and-joint liability rule applies to the platform and the primary wrongdoers).

Another area in which the liability regime is likely to have a significant impact on investments is innovation. A stricter liability rule can affect both the rate and direction of innovation. First, the increase in the total cost of providing the service induced by the increase in liability costs will have an adverse effect on future profits from radical innovations that create new services, which could decrease platforms' incentives to carry out such innovations. This argument holds not only for an incumbent platform but also for a potential entrant, thus highlighting another potential entry barrier induced by a stricter liability regime. Note, however, that this argument may not apply to incremental innovations improving the quality of services that are already offered by an incumbent platform. The reason is that incentives to innovate are driven by the difference between post-innovation and pre-innovation profits, and, in this case, both terms may be affected by the increase in liability costs.

Second, a change in the liability rule applying to platforms may also affect the level of investments in innovation indirectly through its effect on competition between platforms. As emphasized before, a more stringent liability regime may lead to a decrease in competition because of an increase in entry barriers. Less intense competition will, in turn, affect the platform's incentives to innovate. The long-standing literature on the effect of competition on innovation suggests that the level of innovation is either increasing in the degree of competition or is an inverse U-shaped function of competition intensity (see e.g., Aghion et al. 2005 and Vives 2008). In both cases, a decrease in competition in a market that is highly concentrated (e.g., a market with a dominant platform) will tend to lower the incentives to innovate.

Third, the degree of stringency of the liability regime that platforms are subject to may also affect the "direction" of innovation, i.e., platforms' choice between different types of innovations. More specifically, a (more) stringent liability rule is likely to make platforms favor (more) innovations leading to services and functionalities that do not entail high liability costs for them and innovations that reduce liability costs associated with the services offered by the platform. Whether such a distortion in the direction of innovation is socially desirable is an open question.

[31] These technologies can be developed *internally* by the platform's owner. A notable example is Youtube Content ID, a system available to copyright holders to identify and manage their content. Alternatively, these technologies can be acquired in the market from third parties. For example, Audible Magic Automatic content recognition (ACR) is used by several social media platforms, such as Facebook, Soundcloud, Twitch, to identify the title, rights, and permissions of content circulating online. Other content recognition technologies include Nielsen's Gracenote and ACRCloud giving rise to a market for content fingerprinting.

Third parties' investments and their interplay with platform's investments

The liability regime applying to platforms affects not only their investments but also the investments, and more generally the actions, of third parties. Consider, for instance, the case of a right holder that can make investments to monitor (and possibly sue) potential sellers of counterfeit goods on a given e-commerce platform. Assume that the liability rule the platform is subject to become stricter. We (and the right holder) would then expect the platform to invest more in detecting and banning sellers of counterfeit goods, thus exerting a positive externality on the right holder. This externality may make the right holder's benefit from investing in monitoring and filtering lower, which would lead to a decrease in her investment. This is a typical free-rider problem and this example highlights a potential *crowding-out* effect that could offset the positive impact of stricter platform liability on investments in actions reducing the presence of illegal goods on the platform.

There may, however, exist forces that work in the opposite direction, i.e., that amplify the direct effect of stricter platform liability on such investments. To illustrate this, consider an e-commerce platform again but focus now on the incentives of a manufacturer (whose product can be sold on the platform) to invest in product safety, for instance, to comply with a certain level of safety below which the good is deemed illegal. If the manufacturer anticipates or observes an increase in platforms' investments in the detection of unsafe products, it will have higher incentives to improve the safety of its product. To understand why, note that the manufacturer's investment incentives are driven by the difference between its expected profit if it invests and its expected profit if it does not. The increase in platform's detection efforts lowers the latter by reducing the probability that an unsafe product would go undetected and either leaves the former unchanged or increase it (e.g., because the lower risk of buying an unsafe product increases the number of buyers on the platform). In both cases, the manufacturer's incentives to invest in product safety increase. We can therefore conclude that a stricter liability regime for platforms may lead to a decrease in some third parties' investments in harm-reducing actions but may also induce an increase in such investments on the part of other third parties.

5. Discussion

The economic analysis in Section 4 sheds light on some of the general trade-offs that policymakers should account for when designing a liability regime for platforms. In this section, we take our analysis one step further by studying the implications of three specific aspects of liability rules.

Incentivizing platforms to monitor

It is fundamental that service providers should not be discouraged from taking proactive measures that increase their level of knowledge on misconduct occurring on the platform. In the European Union, as discussed broadly by several scholars (e.g., Buiten et al. 2020), platforms might not have appropriate incentives to monitor online activities. This is because the current liability regime grants hosting platforms liability exemption based on the so-called "knowledge standard". In other words,

platforms can benefit from immunity when they do not know about illegal ongoing activity or information hosted on the platform and when they act expeditiously to block access to it upon notification. One often proposed solution is the adoption of a "Good Samaritan" approach, already present in the US, which exempts platforms from liability when pro-active measures to detect online misconduct are undertaken (Buiten et al. 2020). Such an approach would not only induce platforms to observe, monitor, and become informed about online misconduct but would also enhance their ability to ban and report wrongdoers in a timely fashion.[32] In this sense, a "Good Samaritan" rule may foster self-regulation. We note that the recent proposal unveiled by the European Commission for a Digital Services Act fills the void that was present in the previous regulation by introducing a liability exemption also for those intermediary services that "carry out voluntary own-initiative investigations or other activities aimed at detecting, identifying and removing, or disabling of access to, illegal content" (Art. 6).

Monitoring and acquisition of information may, however, be subject to errors. For instance, an automatic detection tool may perform poorly in understanding context and, hence, in disentangling the difference between (unlawful) hate speech and lawful, but potentially harmful, content[33]. This illustrates the more general concern that an intervention by the platform to remove illegal content or material is likely to generate both type-I errors (i.e., false positives) and type-II errors (i.e., false negatives). Therefore, an optimal liability system should incentivize platforms to intervene in a reasonable amount of time to limit or avoid harm as well as to invest in *prediction accuracy* when using automatic tools. To be effective and avoid platform cherry-picking on what to remove (because risky) and what to maintain (because generating substantial revenues), a liability regime should not only promote platform intervention but also help third parties to report alleged violations and invest in screening technologies as well.[34]

In the same vein, it is also important to discourage platforms from undertaking excessive actions. For instance, due to the risk of being held liable for not promptly removing illegal content, a platform may take a defensive stance and over-remove potentially lawful content or products that lie in a "grey area". This is especially the case when the probability of being sued for illegal removal is very low or, alternatively, the damage requested by a right holder (in the case of protected content) is large enough.[35] Such over-removal would therefore lead to a reduction of their welfare. Two recent papers provide some interesting insights in this respect. Liu et al. (2021) study the incentive of a social media platform to moderate content and find that imperfect targeting might lead to over-removal of moderate content relative to extremist ones. De Chiara et al. (2021) study instead the incentives of a

[32] According to the European Commission, *"under the Code of Conduct on Countering Illegal Hate Speech Online, internet companies now remove on average 70% of illegal hate speech notified to them and in more than 80% of these cases, the removals took place within 24 hours*." See https://ec.europa.eu/commission/presscorner/detail/en/IP_18_1169

[33] Using data from transparency reports by Facebook, Instagram, Twitter, and Snapchat, the percentage of content that were subject to moderation and categorized as being likely illegal ranged from 15% to 33%. The remaining content were categorized as likely legal but harmful (see UK Online Safety Bill – Impact Assessment, Table 18).

[34] Another policy that could mitigate cherry-picking and increase transparency would be to define standards that the algorithms governing platforms' decisions to remove or maintain content would need to comply with. Note, however, that full transparency of algorithms may lead malicious users to act strategically to game the system.

[35] The Center for Internet and Society at Stanford Law School reports evidence of over-removal from different studies. In its blog, it is argued that "*A company that takes an "if in doubt, take it down" approach to requests may simply be a rational economic actor. Small companies without the budget to hire lawyers, or those operating in legal systems with unclear protections, may be particularly likely to take this route".* See http://cyberlaw.stanford.edu/blog/2015/10/empirical-evidence-over-removal-internet-companies-under-intermediary-liability-laws

hosting platform to take down content upon receiving notice by a right holder. They show that the platform will challenge the notice if the gains associated with keeping the content online are large enough whereas the platform will not challenge the notice and instead remove the content otherwise. Anticipating this, in the latter case, if the screening device employed by the right holder is imperfect and type-I errors can emerge, there are circumstances under which the right holders will never make effort to improve its screening technology, thus leading to over-removal. To tackle the issue of over-removals and limit misuse of the platform's notice and take down system, the recent European Commission's proposal for a Digital Services Act imposes to online platforms to suspend, after a warning, the processing of notices and complaints submitted by those who "frequently submit notices or complaints that are manifestly unfounded" (art. 20).

Procedural obligations

Let us now consider a liability regime that grants liability exemption to online intermediaries that comply with a series of *procedural obligations*. Such obligations might be desirable if they induce, for example, platforms to promote unambiguously user-generated reporting.

For instance, an e-commerce platform could be eligible for liability exemption if it implements a *simplified* and *transparent* system to report illicit practices but also a timely response to solicitations and feedback requests from those sellers excluded by the platform or taken down.[36] This would reduce the occurrence and impact of over-removals of lawful content and products (i.e., type-II errors). At the same time, a more transparent system in which sellers can dispute removal requests may avoid opportunistic behavior from other sellers filling notice and takedown requests with the mere objective of harming competitors. In the context of social media platforms, liability exemption could be granted to a platform conditional on (i) presenting systems to report effectively hate speech and all types of misconduct and (ii) taking proactive measures to inform its users about its moderation policy. On the other hand, no liability exemption should be granted for unlawful content that the platform sponsors, renders prominent or indirectly viral.

To further increase transparency on platform activities, it would be advisable to have platforms provide reports and summary statistics to the public.[37] For instance, a social media platform could be required to provide information about the number of fake accounts being blocked, the types of content typically moderated, the number of reports filed by users (e.g., flagging a post or a user), as well as the number of groups seized because sharing illegal content (e.g., piracy websites, child pornography, etc). By the same token, e-commerce platforms could be required to provide information on the number of notifications received, the number of actions undertaken against sellers, the average time to reach a decision, as well as information on the effort provided to tackle misconduct online. It is also crucial that transparency applies as well to complaints about over-removals and the way the platform handles them.[38] The European Commission's proposal for a Digital

[36] For instance, Google already provides statistics on copyright removal requests. See https://transparencyreport.google.com/copyright/overview?hl=en

[37] In the European Union, for example, these additional rules would complement those already identified by the EU Regulation on platform-to-business relations (P2B regulation) for which platforms had to comply with before July 13, 2020.

[38] For instance, the German Netzwerkdurchsetzungsgesetz (Network Enforcement Act, "NetzDG"), which only applies to social network, requires *manifestly* unlawful content to be taken down within 24 hours without an in-depth examination by the hosting platform. For non-manifestly unlawful content, platforms may carry out more in-depth examination before the

Services Act imposes to online intermediaries that are not microbusinesses transparency reporting obligations, with detailed reports to be published yearly about the content moderation activity carried out by the platform's owner. Similar transparency obligations are required for those services that, in the UK, fall within the Category 2A/2B.

Moreover, as review and rating systems might be effective to discipline sellers and inform buyers, a policymaker might be willing to grant liability exemption subject to the implementation of operational duties such as the provision of *effective* reviews and rating systems. Also in this case, a review and rating system should be transparent, of easy accessibility and should prevent (or ex post delist) fake reviews.

Distinction between small and large platforms

Platforms are highly heterogeneous. As already discussed, applying a one-size-fits-all liability regime to all of them is likely to amplify current asymmetries, leading to further concentration and competitive advantage for large incumbents. While it is not the role of liability rules to safeguard competition in the market or address issues of dominance, one must recognize that a change in the liability regime might affect competition and that some platforms might be better equipped than others in dealing with online misconduct (e.g., because of economies of scale or scope, or data-driven incumbency). A liability regime can take these aspects into account by introducing additional clauses for platforms that are "big".[39] For instance, liability may apply to large online intermediaries when tortfeasors are no longer prosecutable or identifiable. For example, e-commerce platforms could be held liable whenever a vendor selling counterfeits disappears from the radar of primary enforcement. This may induce the platform to take appropriate measures to identify sellers and to prevent them from engaging in *hit-and-run* opportunistic behavior, i.e., from joining the platform to sell illegal products and then disappear and create a new account.

Relatedly, one could wonder whether a similar gatekeeper liability should be applied when direct enforcement of primary liability becomes challenging because the tortfeasors and the harmed party are not located in the same country. While this would increase platforms' incentives to facilitate the enforcement of primary liability (e.g., by investing more in monitoring), it could also have unintended adverse consequences. For instance, it could encourage e-commerce platforms to restrict cross-country transactions, which could be detrimental to consumers. A careful cost-benefit analysis is therefore needed to assess whether a policy implementing such a transfer of liability would be desirable. This cost-benefit analysis should also take into account the effect of such a policy on the actions of third parties, including potential wrongdoers. The reason is that the changes in platforms' behavior resulting from this policy may induce changes in the behavior of third parties that can be

content is blocked or removed within seven days. According to the law, platforms receiving more than 100 complaints per year are required to produce a publicly available report on how complaints are handled.

[39] Implementing a liability regime that depends on whether a platform is "big" or not requires defining what is meant by "big". This could be based on the number of users the platform has achieved and/or its revenues. For instance, for an e-commerce platform, this could be based on its volume of sales. For examples involving social media platforms, two interesting cases are the German NetzDG, which only applies to social networks with at least two million registered users in the Federal Republic of Germany, and the French Law on information manipulation which only applies to platforms with at least 5 million monthly visitors on French territory. Alternatively, the size of a social media platform could be defined on the basis of its single-homing (i.e., unique) users and its advertising revenues.

either desirable or undesirable. For instance, as discussed in Section 3, an increase in the platform's monitoring efforts could undermine the monitoring efforts of some third parties (e.g. intellectual property holders) but could also lead to an increase in the level of care of other third parties (e.g. manufacturers of potentially unsafe goods).

A liability regime that places a specific burden on big platforms could also offer the possibility for such platforms to get exempted from this burden if they take pro-welfare actions, such as sharing data and technologies with rivals for the purpose of identifying illegal content. As discussed in Section 2, increased liability is likely to result in a competitive advantage for those platforms that have collected data and acquired skills to deal with illegal content and online misconduct. Exemption from the additional clauses intended for "big" platforms could be granted, for instance, if platforms license their technologies or make their past (yet anonymized) data available to their (smaller) rivals.[40] For instance, an e-commerce platform may share pictures and information about the most widespread counterfeit products as well as any data that can help to "train the algorithms". Such a policy would, at the same time, limit the potential adverse effects of imposing stricter liability on "big" platforms and reduce the liability costs of small and entrant platforms, thereby reducing barriers to entry and expansion.

However, making big platforms subject to a stricter liability regime than smaller ones could have the unintended effect of transferring illegal content and material from big platforms towards smaller ones.[41] This could strengthen the competitive advantage of big platforms if users observe or believe that the risk of being harmed (e.g., the risk of buying a counterfeit product) is larger on smaller platforms and, consequently, decide to favor (even more) big players for their online activities.[42] Again, one way of addressing this problem would be to encourage the transfer of technology and data from big platforms to smaller ones and, more generally, to support the development of a well-functioning market for monitoring tools. That would allow small platforms to detect and remove illegal content and material more effectively and to ensure users that the likelihood of suffering harm on them is not higher than on big platforms.

The European Commission's proposal for a Digital Services Act presents a differential system for being subject to liability exemption. This seems to be an important step for ensuring greater (social) responsibility by large platforms while maintaining a competitive landscape in which small entrant platforms can offer their services. Specifically, it identifies as "very large platforms" those online platforms that for their market reach (i.e. more than 10% of European consumers) can have a prominent role in the diffusion of illegal content. These platforms have additional obligations such as

[40] Note that welfare-enhancing data sharing and technology licensing can also be achieved with other tools. For instance, in 2017, the Security Council of the United Nations launched the *Tech against Terrorism* initiative to support small platforms monitoring and taking down terrorist content. Through the framework of the Global Internet Forum to Counter Terrorism, this implies the construction of a database, shared among big and small platforms, of more than 88,000 unique digital hashes linked to terrorist content. A similar initiative concerning a database of hashed child abuse was launched in the UK by Internet Watch Foundation (IWF) and in the US by the National Centre for Missing and Exploited Children (NCMEC). Note also that, while we focus here on transfers of technologies and data from "big" platforms to smaller ones, transfers from the latter to the former may be desirable as well.

[41] Adopting a stricter liability regime for big platforms may also affect user's decisions to single-home on a "big" platform or multi-home. However, it is unclear whether we should expect multi-homing to increase or decrease following such a change.

[42] However, on the positive side, if most illegal content and material migrate to niche markets intermediated by small platforms then the impact of harmful content and material might be lower due to smaller network externalities. Moreover, this could also lead to a decrease in enforcement costs.

the presentation of a code of conduct, data sharing with researchers and authorities, as well as the implementation of a risk management system.[43] Quite similar obligations apply to those "user-to-user services" that, for the number of users and functionalities, will fall within Category 1, as defined by the UK Online Safety Bill.

6. Conclusion

Designing the optimal liability regime for online intermediaries requires a careful understanding of the underlying economic trade-offs. Our analysis establishes that the liability rule applying to platforms affects not only illegal conduct on the platform and the resulting litigation but also some of the platform's most critical economic decisions, such as those related to pricing, terms and conditions, business models, and investments. It also shows that a sound assessment of the impact of a given liability regime should account for the way third parties that use platforms or are affected by their activity will respond to it.

Our study sheds light on the costs and benefits associated with platform liability. While our analysis is far from exhaustive, it provides a conceptual framework emphasizing the importance of economic incentives that could be useful to policymakers designing and upgrading the liability regime applying to online intermediaries. However, we are also convinced that our understanding of the economics of platform liability is incomplete, especially because of the lack of empirical evidence. In this perspective, it would be advisable to increase transparency on platform markets by making available to researchers raw and aggregate data on platform content moderation and removal activity. This may also guide policymakers in ensuring the right balance between the respect of the core democratic freedoms and the platform's involvement in the activities carried out by its users.

While we do not intend to provide precise recommendations regarding the liability regime that should apply to platforms, we believe that our economic analysis offers strong support for the following two claims. First, the current liability regimes in the EU and the U.S., introduced about two decades ago, face several limitations that justify revising them. Our analysis identifies some of the benefits and costs of potential upgrades. Second, given the heterogeneity among platforms regarding their business models, the sectors they operate in, their size, and the nature of third parties their intermediation services can harm directly or indirectly, a one-size-fits-all liability regime is likely to generate substantial inefficiencies.

[43] According to the Digital Services Act (art. 26), very large platforms should provide a risk assessment specifying those risks associated with the dissemination of illegal content, negative effects for the exercise of fundamental freedoms (e.g., freedom of speech, respect for private and family life, etc.), intentional manipulation of the services. In the same vein, the UK Online Safety Bill requires those providers classified as Category 1 should also comply with duties for the protection of adults' online safety, freedom of expression and privacy, protection of content of democratic importance, as well as protection of journalistic content.

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