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Platforms´ regulatory disruptiveness and local regulatory outcomes in Europe

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Abstract: One of the manifestations of platform power is the ability of platforms to successfully ignore existing rules and disrupt established patterns of regulation, thereby challenging the pillars of the regulatory state. But while the disruptive nature of the platform economy has often been invoked, it has rarely been empirically researched. We aim to fill this gap by putting the 'disruption' thesis to the test. We investigated whether platform companies disrupt local regulations. The findings show that sectoral platform companies are less disruptive to local regulations than widely believed. Platforms face a variety of regulatory responses, including the enforcement of regulations and the banning of platforms that fail to respect local rules. We operationalise disruption as the implementation of new regulation, exploring where and whether regulatory disruption takes place. This article combines a comparative analysis of 99 city regulations in the transport (ride-hailing) and housing (apartment-sharing) sectors in which platform companies are active, with examples from qualitative case studies.

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Introduction

The platform economy has progressed in just a few years from a few start-ups to an industry of global mega-companies. These companies have changed how we travel, work, socialise, and even fall in love (Rahman & Thelen, 2019; Frenken et al., 2019; van Dijck et al., 2018). Before the COVID-19 pandemic, the ride-hailing platform Uber was active in 500 cities across 24 countries and transported over 10 billion customers, all without owning cars or employing drivers. Since its founding in 2008, the lodging marketplace Airbnb has offered 7 million places to stay in more than 100,000 cities across 191 countries, more than any hotel chain. Platforms' ubiquitous presence in our lives, their large user base, and their role as information gatekeepers constitute 'platform power' (Lehdonvirta, 2022).

One of the manifestations of platform power is the ability of platforms to successfully ignore established rules and disrupt existing patterns of regulation, thereby challenging the pillars of the regulatory state (Collier et al., 2018). To accommodate the interests of these new companies — which are able to mobilise consumer interest to press their case — governments are pushed to adapt regulatory regimes ex-post (by lowering standards) (Culpepper & Thelen, 2020; Pollman & Barry, 2017). But while the disruptive nature of the platform economy has often been invoked in the literature, it has rarely been systematically empirically researched (Collier et al., 2018; Owen, 2015). We aim to fill this gap by putting the 'disruption' thesis to the empirical test, exploring where and whether regulatory disruption takes place.

We understand regulatory disruption as a situation that changes the deep structures and rules that govern a market. We investigated whether platform companies force local governments to alter existing local regulations, analysing how cities respond to platform companies, and to what extent they concede to and accommodate them. We collected data on regulatory outcomes and reforms in 99 cities and connected them to the operation of platforms. The findings suggest a variety of regulatory outcomes that tend to change over time and across sectors. In 2019, local regulations were changed and disrupted in half of all the cases. However, cities were also surefooted, choosing to enforce their regulations and ban platforms that failed to respect local rules. The willingness of cities to limit platform power by

enforcing regulations increased over time.

Our contribution to the literature on platform power is twofold. First, we have conceptualised and operationalised platform power as disruptiveness, and empirically tested the 'disruptiveness thesis' by analysing cities' regulatory responses to the rise of platforms. We analysed an important analytical step to locate and critically assess the power that platforms and similar technologies hold over the state and existing regulations. However, we did not observe the mechanics of how platform power is created and maintained, or how counter-power is activated and when it is successful. Several studies have engaged in the analysis of power battles (Aguilera et al., 2021; Hajibaba & Dolnicar, 2018; Chan & Kwok, 2022) and mechanisms of platform power (Culpepper & Thelen, 2020; Rahman & Thelen, 2019; Valdez, 2023; Occhiuto, 2021; Seidl, 2022; Lehdonvirta, 2022; Yates, 2023). Instead, we observed the impact of platforms on regulatory outcomes in European cities.

Second, we introduced our comparative approach to study the regulatory patterns of the platform economy at the subnational level. Most studies have limited themselves to in-depth single case studies or comparisons of a few exceptional cases across several countries; our conceptualisation of regulatory patterns enables the systematic cross-sectoral, temporal, and cross-city comparisons that are missing from the literature. In this way, we can discern the effects of sector specificities, national regulatory frameworks, and local conditions on city regulatory outcomes.

The remainder of the article is structured as follows. The next section introduces the various theories of the sources of platform power and how they relate to the regulation of platform companies. We also describe our understanding of regulatory disruption. In the third section, we present our approach to operationalising regulatory disruption. After that, we present our empirical findings, discussing how disruptive these platform companies actually are in the two sectors in Europe. The concluding section considers implications for future research on platform power and regulation.

Platform power and (regulatory) disruptiveness

Platform companies are digital infrastructures that create a 'two-sided market', enabling exchange between two distinct user groups which both benefit from the digital platform's network effect (Kenney & Zysman, 2016); platforms "create and capture value by exploiting the interactions in the ecosystems that emerge around them" (Valdez, 2023, p. 177). We define a 'platform company' as a platform which intermediates and manages the interactions between consumers and producers or

service providers by supplying the infrastructure for the exchange between supply and demand (Sundararajan, 2016).

The rise of the platform economy has been proclaimed as revolutionary, disrupting and displacing long-established competitors, and forcing authorities to rethink or update the regulation of entire sectors (Sundararajan, 2016). The narrative of the unstoppable rise of the platform economy has identified the forces that lead to the rather uniform and generally permissive regulation of platform companies (Collier et al., 2018; Tzur, 2019). Sudden entries into the market have challenged, and sometimes disrupted and altered, regulatory systems towards a more permissive regulatory environment at the expense of traditional business models (Rahman & Thelen, 2019). However, we doubt whether this narrative can be confirmed by empirical data.

Platforms present a challenge for governments and agencies that are willing to regulate them. One problem is directly linked to platforms' high-tech nature and "the limited knowledge that most social actors have concerning how it works and why, and what are the possible applications and consequences of its deployment" (Taeihagh et al., 2021, p. 1010). As a result, regulators suffer from a lack of information about the new services and how to classify them. Platforms also use numerous strategies to actively defy the sectoral boundaries of regulatory systems in sectors such as transport or housing. They can delay regulation by claiming that they act only as tech platforms connecting different users, or by frequently changing their business classification and "reinventing categories" (Mazur & Serafin, 2022). They mobilise their user base to lobby for permissive regulation (Yates, 2023) or engage in litigation to challenge enforcement (Mazur & Serafin, 2022). Regulating the platform economy is also challenging for multi-level governance relations, as both transnational and subnational regulations become increasingly relevant and challenged in their regulatory capacities.

Nevertheless, recent empirical research has revealed that platforms face a variety of regulatory roadblocks, questioning the current understanding of platform power (Valdez, 2023). Studies on platform-government relations with information platforms, and social networks like Facebook, Amazon, YouTube, and Google, have found fluctuations in platform power depending on the political context and social counter-strategies (Flew, 2021; Flew & Gillet, 2021; Poell et al., 2023; Gorwa, 2019, 2021). Flew and Gillett (2021) identified a shift from self-regulation to supra- and national regulation of platforms as a sign that platforms face greater coercion from states and social actors.

Moreover, empirical studies on the regulation of platform companies such as Uber and Airbnb have shown substantial variation across countries and cities — both in the stringency and the substantive focus of regulation (Aguilera et al., 2021; Adamiak, 2019; Tzur, 2019). Uber has lost many regulatory battles and in many jurisdictions has been forced to adapt to existing taxi laws. Airbnb's silent transformation of cities has recently come to the fore due to intense pressure on local housing market prices; local regulators are taking steps to regulate its impact on the housing market and gentrification. Despite rapid growth, Uber and Airbnb have been forced to adapt to local rules, change the nature of the services they provide, and negotiate different regulatory frameworks — especially since the COVID-19 pandemic. This account of frequent adjustments, compromises, and regulatory battles at the local level shows the need to further conceptualise and empirically study platform power and its limits in places where it faces regulatory pushback.

Facets of platform power and regulatory entrepreneurship

Platforms are regarded as having an advantageous position *vis-à-vis* government due to their power and influence. This results from their market power and monopoly position (Thelen, 2018), instrumental power conveyed by lobbying (Chan & Kwok, 2021; Yates, 2023) and '(infra)structural power' drawn from their coalition with the consumers of their services (Culpepper & Thelen, 2022; Valdez, 2023). Platform companies have taken a large portion of the market in a short time; within a few years platforms have collected large user bases and grown into some of the largest enterprises, outgrowing national champions and multinational franchises. Thelen (2018) argues that once a new digital platform has attracted a substantive user base, its market power is hard to overcome by political actors. The 'network effect' makes platforms quasi-monopolies and their size gives them influence over markets and makes them too big to ban.

Platform power does not only stem from platforms' commercial activity but also from cultivating connections to the corridors of power in national parliaments and the EU. In this sense, platforms operate similarly to traditional corporations and multinationals (Gorwa, 2019). Giants like Uber and Airbnb are financially supported by venture capital (Rahman & Thelen, 2019). This generous support gives them an enormous amount of economic influence and leeway to lobby for a lenient regulatory approach (Yates, 2023). The information uncovered by the 'Uberleaks files' shows that Uber has used multiple methods and lobby venues (Cann, 2022). Many researchers have mapped these strategies: Seidl (2022) demonstrated how Uber mobilises consumers in the US to campaign in its name, while others have described how Airbnb has engaged in astroturfing, inciting users to pressure cities

(Yates, 2023; Van Doorn et al., 2021).

Other scholars argue that platform power is automatic and built into the political and economic structure. Valdez (2023) argues that the power of a platform is tied to its normal operation (the services it provides to public and private consumers) and the strategic dependence upon them. She calls this the infrastructural power of platforms. Platforms mediate between producers and consumers of goods, services and information, creating an ecosystem that depends on them (van Dijck et al., 2019; Srnicek, 2016). Their strategic importance as gatekeepers and intermediaries between a large number of actors gives them leverage to adopt strategies to avoid, shape, and create (favourable) rules. Rahman and Thelen (2019) agree that consumers' dependence on the goods and services that these firms provide is what grants these companies platform power: "Platforms' uniquely unmediated link with users and their appreciation for these platforms tilts the terrain in the firms' favour, as no politician wants to be the one that impedes consumers' access to Amazon's next-day shipping, or Facebook's information flow" (Rahman & Thelen, 2019, p. 186). In sum, platforms derive their power from the appreciation of their consumers and their direct connection with users.

However, this visibility and direct connection with users also constitutes the Achilles' heel of platform power (Popiel, 2022). Culpepper and Thelen (2020) argue that the coalition between consumers and platforms can be broken when consumers' satisfaction and trust are breached and more public-minded issues come to the fore in the political debate. Platform power vanishes when consumer identity is overshadowed and citizens are mobilised in defence of more public-minded issues, creating a new coalition (Seidl, 2022; Pelzer et al., 2019). Culpepper and Thelen (2020) cited the data protection concerns following major scandals that have reminded consumers of the unaccounted costs of the new services. Seidl (2022) showed how environmental concerns and labour justice framing have tilted the scales in favour of regulation of Uber in New York City. These shifts in policy attention show that platform power is contingent rather than automatic (Poell et al., 2023; Popiel, 2022). Platforms negotiate their institutional position with a large number of actors (competitors, consumers, citizens, and regulators) who challenge platform power by trying to limit their space and cement this in regulation (Gorwa, 2021). Regulation thus becomes a space of contestation and power play.

The empirical manifestations of platform power consist of platforms' capacity to skirt or reshape regulations (Collier et al., 2018). A growing body of research suggests that 'radical innovation' technologies like platforms are not "primarily about technological innovation or filling market gaps with new products, but about ac-

tively challenging institutions so that their business model is legitimised and accepted" (Pelzer et al., 2019, p. 2). Platform entrepreneurs aim to challenge and ultimately tilt the existing legal framework in their favour as part of their business plans (Pollman & Barry, 2017, p. 392). Instead of seeking compliance with existing rules and regulations, many companies (especially Uber and Airbnb) seek to enter local markets and create the broadest possible consumer base in a relatively short time. This broad base of users will defend the interests of the platforms and force regulators to succumb and change the regulatory regime, paving the way for a new permissive regulatory framework (Aguilera et al., 2021; Thelen, 2018). According to Collier et al. (2018), this strategy constitutes a case of regulatory capture, making disruptiveness a crucial concept in the discussion of the power of platform companies.

Platform companies link their disruptiveness to their innovation potential and business strategy. They portray themselves as disruptive innovators that provide not only new services and greater efficiency to existing markets, but also a new way of imagining the future of public services and cities (Wells et al., 2023). Their strategy of entering markets extralegally and lobbying for regulatory change is presented as the consequence of the process of creative destruction. They claim that the existing rules do not apply or represent restrictive roadblocks to innovation, stifling the full innovative potential of platforms. To capture and disrupt local markets, sectoral platform companies strategically use loopholes in labour and financial regulations, taking advantage of government agencies' lack of adaptation to regulating new technologies (Rahman & Thelen, 2019, p. 12). Platform companies also seek to evade or delay the enforcement of the regulatory standards applying to traditional companies in the hospitality and transportation sectors by claiming that they do not actually act as providers of such services, but only as tech platforms connecting different users (Mazur & Serafin, 2022).

In the current literature, the concept of regulatory disruption is quite ambiguous. Collier et al. (2018) have provided the clearest definition, seeing it as a two-step regulatory capture in which a new entrant initially disregards the existing regulatory regime; subsequently, the challenger is accommodated by new rules that lead to a dual regulatory regime. Most research has implicitly adopted their thesis (Mazur & Serafin, 2022; Occhiuto, 2021; Seidl, 2022; Valdez, 2023). Wells et al. (2023), however, link regulatory disruption to platforms´ influence on problem definition, agenda-setting, and policy solutions. In this way, platforms capture policymakers' imaginaries of the future of cities and shape them in their favour. Taylor Owen´s *Disruptive Power* (2015) provides a different understanding. He plays with

the idea of disruption as a state capture that affects the state's ability to provide the rule of law and organise collective action.

Our conception of regulatory disruption builds on Collier and colleagues (2018) and the notion of an interruption or break in the existing regulatory framework. Regulations relate to a specific business model or type of public service. The policy problem of disruption stems from a "disconnection between the existing regulatory structure and the business innovation threatening the incumbent industry firms or the service provided" (Biber et al., 2017, p. 1580). Policy disruption can result from conscious choices by entrepreneurs to exploit ambiguous laws, from legal loopholes or from business innovations which the existing regulatory regime does not apply to (Biber et al., 2017). In these cases, the existing rules and regulations are ineffective or are insufficiently developed to achieve the goals for which they were designed.

Disruption is thus a change in the architecture of the institution or service regulation that alters the status quo. It follows therefore, that policymakers have to change their organisations´ tasks to better suit the situation, also disrupting those who previously operated in the sector. To distinguish the disruption from partial adaptation to the new challenge, this change has to be abrupt, lead to a change of institutional structure and accommodate the needs of the disruptor company. Therefore, we conceive of regulatory disruption as a situation in which regulators recognise a mismatch between the new business model and the existing regulatory framework and its purpose and alter the existing regulation to accommodate the platform company's new business model.

Data, concept operationalisation, and methods

This article combines a comparative analysis of the regulatory outcomes of platform companies in the transport (ride-hailing) and housing (apartment-sharing) sectors at city level in 99 cities in 21 EU countries at two points in time. We used 2019 and 2022 as our years of reference for coding (the last year before the COVID-19 pandemic and the last year of the pandemic — when the restrictions were lifted). European cities provide a quasi-experimental setting to analyse regulatory patterns due to platform companies' uniform strategies across countries and cities, almost identical timing, and their fast-paced entry to local markets. As large platform companies aim to bypass the local market and regulations, we treat their 'entrance' as a somewhat uniform external shock to existing regulation (Ilsøe & Soderqvist, 2022). We observed both platforms active in different sectors in the same city at the same time. The subnational setting enables an examination of re-

cent widespread regulatory changes and variables affecting the platforms, controlling for many possible confounders that are held constant in this case (Slater & Ziblatt, 2013).

In this article, we focus on sectoral platforms that have a strong local dimension and are at least partially regulated at the city level — unlike infrastructure platforms such as Facebook, Google, and Amazon (van Dijck et al., 2018). We distinguish by sector, as regulatory outcomes and contexts can vary by policy area. We selected the housing and transportation sectors; both sectors were affected by the rise of platform economy companies and have only one or few dominant operators (Airbnb for housing, Uber, Bolt, and FreeNow for cars). The housing market operates at an intersection between private property and public value (Foglesong, 1986); transportation, on the other hand, is characterised by a complex mix of private, semi-public, and public providers that have to be regulated to secure equal access and functional transit systems (Sundararajan, 2016). In most cases, both platform companies were simultaneously present in the city; this allows for more controlled comparison. This focus also allows us to hold the business model and company characteristics constant across cases.

Uber and Airbnb are also examples of two distinct platform types. Uber is a labour platform; these are forums for discrete tasks and micro-work where gigs and small tasks are bought and sold (Ilsøe, 2017). Airbnb is classified as a capital platform where participants can sell goods or rent assets. These differences yield information on how disruptiveness can vary between sectors and platform types.

We focused on European cities. Despite leaving out large parts of the world where platforms are booming, a European focus has many practical advantages for comparative analysis. Europe provides a variety of institutional, political, and administrative contexts in which substantial differences in regulatory responses should be expected. The European Union also provides a regulatory and normative framework, helping to focus our research on those variables that differ across countries and cities. Moreover, the European legal framework might introduce some uniformity in at least some aspects of regulating companies such as Airbnb and Uber. The 2017 ruling by the Court of Justice of the European Union (CJEU) confirmed that Uber is a transportation company, and the Digital Market Act (DMA) will establish harmonised rules for short-term rentals and provide public authorities with access to data for tax and regulatory purposes.

Our variable of interest is regulatory disruption. We start from an inherent element of large platform companies' business models — the intention to 'disrupt' existing

markets and flout regulatory systems (Collier et al., 2018). When defining regulatory disruption, we follow the framework presented by Collier and colleagues (2018). They describe disrupted regulation as being characterised by a two-stage challenger-incumbent cleavage. First comes "the regulatory arbitrage" stage when the new entrant disregards the existing local regulations. This is followed by "the regulatory entrepreneur stage" when the government incorporates the challenger, creating a new regulatory regime. We presuppose that such open challenge and disregard will render existing regulations inadequate, ineffective, or obsolete, requiring a regulatory response. A platform's entry thereby forces local governments to respond reactively. We argue that the consequence of the regulatory disruption is the creation of new regulation rather than the enforcement of existing regulations, outright bans, or a *laissez-faire* approach.

The crucial factor that distinguishes the disruptive category is the enactment of a new regulatory framework; bans and enforcement do not require new regulation, only strengthened enforcement. These two enforcement strategies also show the capacity of local governments to challenge the power of platforms and demonstrate their limits. We do not include the *laissez-faire* approach in our disruption category as it is unclear whether the regulatory passivity originates from a lack of capacity to act — despite being disrupted — or a lack of perceived threat to the local regulations, market, or consumers (no disruption).

First, we mapped local regulatory outcomes to operationalise the disruption. Next, we created a dichotomous variable to capture whether the new regulation was enacted in response to disruption, and zero otherwise. A similar approach was used by Collier et al. (2018) in the US. To conceptualise the regulatory outcome, we built on recent studies that distinguish between three main regulatory options: i) full prohibition of the platform (Ban); ii) the *laissez-faire* approach; and iii) the new regulation of new and old business models, with different degrees of restriction (Regulation) (Guttentag, 2015; Nieuwland & Melik, 2018). In line with Biber et al. (2017), we added a fourth possible outcome: iv) enforcement of existing rules on new actors (Enforcement). We then extracted the new regulation from the regulatory outcome variable as our measure of disruption.

We aimed at a parsimonious definition that could be operationalised equally across many regulatory sectors and a large number of cities. We acknowledge that this measure does not capture whether the regulatory change is gradual or abrupt or whether the regulatory change loosens or tightens the rules for platforms. However, as several studies using similar larger-scale coding have shown, regulatory changes largely accommodate platform companies and allow these platforms to

operate legally in the market (Hajibaba & Dolnicar, 2018; Collier et al., 2018). Tzur (2019) used a sample of 40 US cities and found that regulators prefer newcomers to the market over existing incumbents, approving Transportation Network Companies (so-called TNCs) in 77.5 percent of the cities examined and rarely pursuing harsh enforcement, even when TNCs operated illegally.

To obtain information on the variable, we hand-coded information from official municipal documents (regulations, ordinances, and court rulings), companies, and national and local newspapers. We used the information that companies publish to their users (or employees) for city-specific regulation. Uber provides some scaled-down information to new drivers about specific national and local regulations or sources and where to find them. Airbnb has a specific section on its website ("Hosting responsibly") where the company provides basic information about local regulations. In every country, we coded articles according to the codebook in the original language. We coded both the country and city levels to be able to discern the effect of the former on the latter.

Findings

We empirically studied whether platform companies disrupted city regulations, collecting data on regulatory outcomes from 99 European cities in 2019 and 2022. In 2019, Uber operated in 66 cities (it was banned in 11 cities) and Airbnb had listings in all 99. In 2022, Uber operated in 64 cities. We distinguished between four regulatory outcomes (ban, *laissez-faire*, enforcement of existing regulations, and new regulations). Figure 1 shows all four regulatory outcomes pooling together both sectors (198 regulatory cases in the two sectors of the 99 cities). In Figure 1 we can see that platforms are powerful actors that have an impact on local regulation. In 2019, new regulation was implemented in 104 cases (52.5%) and platforms operated without a legal framework in 43 cities. However, our results also show that platform companies do not necessarily provoke uniform policy change; regulatory responses varied widely between cities. Governments dealt with platforms by trying to fit them into the existing legal structure and banning or delaying their entrance into the market. Rather than giving in to platform companies, cities attempted to maintain control and their enforcement grip increased over time. In 2019, cities decided to use existing regulations in 40 out of 198 cases (20.2%), and 11 cities banned the service (5.56%). In 2022, this number had increased to 51% and 7.22% respectively, demonstrating increasing regulatory capacity.

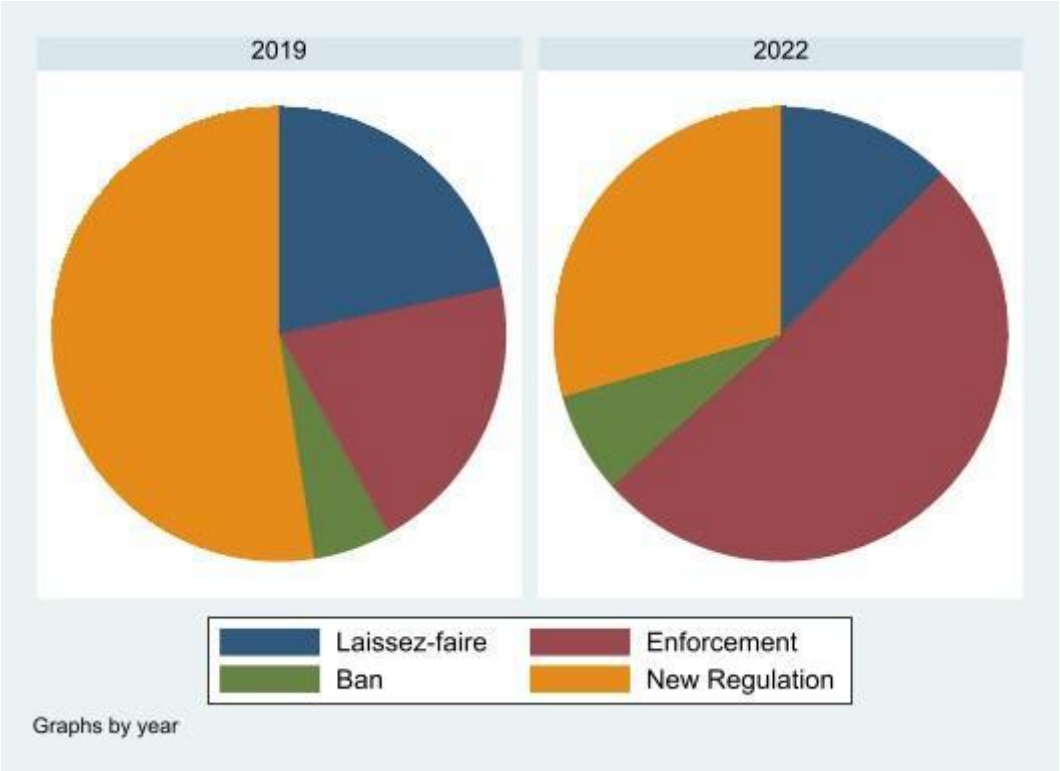

FIGURE 1: Regulatory outcomes at the municipal level (pooled Uber and Airbnb regulatory outcomes) (Source: Based on data from REGULATE project).

We looked for differences between sectors. Figure 2 shows the same regulatory outcome categories but broken down by sector (ride-hailing and short-term rentals) and year. The reception of platforms in 2019 varied by sector. Uber attracted more regulatory resistance (ban and enforcement of existing regulations in 30.3% of cities), whereas Airbnb was left to operate freely (23.2% of cases) or was accommodated by a new regulatory framework (55.6%). In 2022, Uber was forced to obey the existing rules in 61.22% of cities. The level of enforcement for Airbnb also grew from 21.21% (2019) to 40.63% (2022).

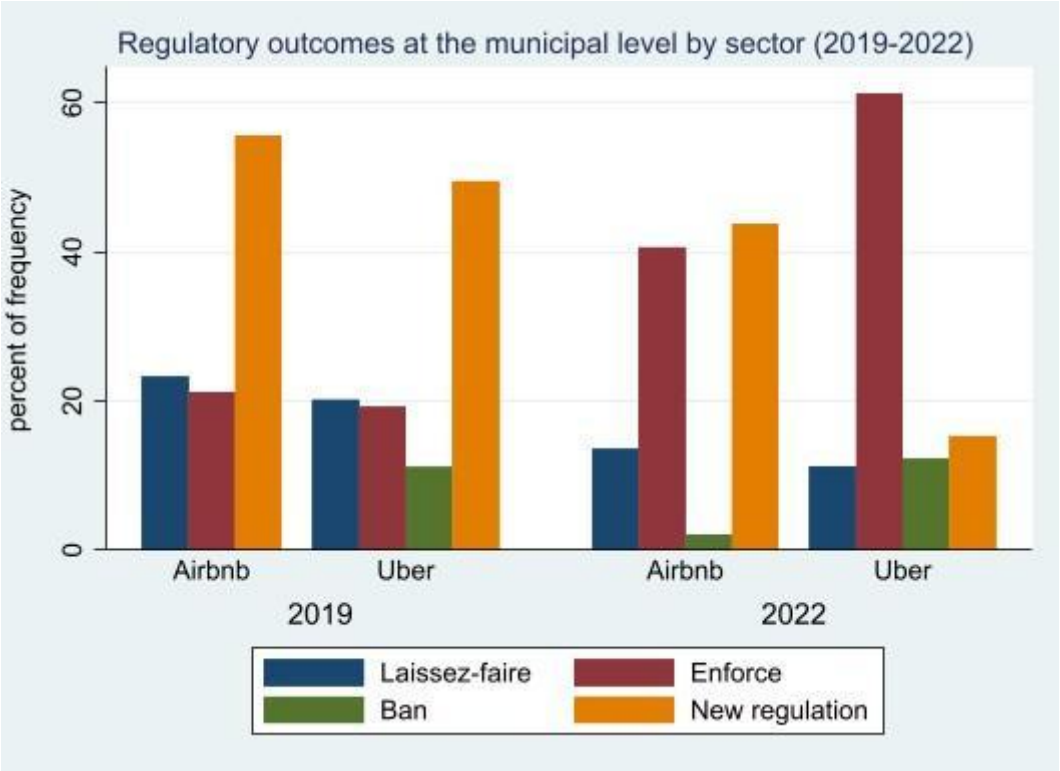

FIGURE 2: Regulatory outcomes at the municipal level by sector (Uber and Airbnb) (Source: Based on data from the REGULATE project).

To capture disruption, we re-coded these four categories into a binary variable indicating disruption of local regulation if the city created new rules to accommodate the platform business model. Although platforms disrupted some local rules, this did not happen in the overwhelming majority of cases, and only about half of the cities changed their regulations to accommodate platforms (Figure 3). Most importantly, we identified differences across sectors and an interesting time trend. Airbnb was more disruptive to local regulations; its presence in a city led to the creation of new regulation in 55.56% (2019) and 43.75% (2022) of cases. Uber's arrival forced a regulatory change in 49.5% cases in 2019, but only 15.31% in 2022. This difference shows that Airbnb's tactics of keeping a low profile and displaying a cooperative attitude towards policymakers have made for a more successful strategy than Uber's aggressive approach, openly challenging its competitors and the local regulators.

All three figures show a clear time trend. Between 2019 and 2022, platform disruptive influence has declined as a lower rate of local governments change their rules in 2022 compared to 2019. The drop in the disruptiveness is evident in both sectors and especially strong for Uber. Since 2019, platforms have continued to lose ground to cities, as city administrations have enforced existing regulations

rather than create new regulatory frameworks.

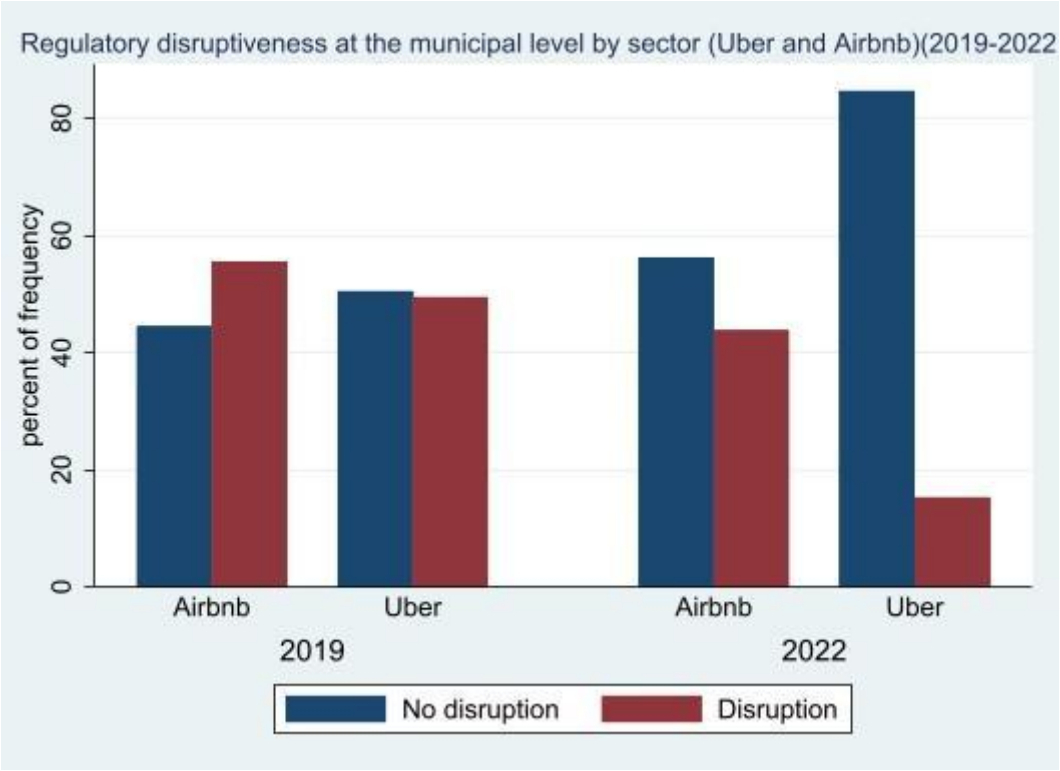

FIGURE 3: Regulatory disruptiveness at the municipal level by sector (Uber and Airbnb) (Source: Based on data from the REGULATE project).

This difference in regulatory disruptiveness might be partly due to the companies' differing strategies and sector specificities. Cities are much more stringent in enforcing the rules with Uber than with Airbnb. Airbnb's business model operates on a bottom-up scheme, with hosts adding their homes and rooms to the platform; in this way, the number of available rooms builds slowly. On the other hand, Uber penetrates local markets strategically, first targeting large cities and tourist enclaves and recruiting drivers for their service. Uber's strategy is based on a quick entry and 'conquest' of local markets, targeting large cities and challenging both existing providers and local governments by experimenting with price dumping and ignoring local regulations. Former Uber CEO Travis Kalanick's aggressive strategy met with strong local resistance, resulting in his replacement in 2017. Airbnb's slow onset has resulted in regulatory responses that are relatively lenient, and new regulation has only been implemented when the problem has grown. Moreover, the housing sector was previously regulated for long-term rentals with no specific regulation for short-term rentals. Airbnb grows in a much larger regulatory vacuum than Uber, which operates in the strictly regulated taxi and transportation markets.

The difference in disruptiveness in the two sectors might also be due to different structural power dynamics supporting regulatory change. Platforms affect members of society differently; "some sectors of society may benefit from the deployment of emerging technologies and the disruptions they involve, while others lose out" (Taeihagh et al., 2021, p. 1011). In the case of a capital platform like Airbnb, the asset-rich middle class might have more power to lobby local regulators for a permissive approach than the migrant workers who drive for labour platforms like Uber.

Lastly, we were interested in whether national regulations determine local disruption and whether cities follow the national regulation or cluster independently. As we also coded the national level, we can see the extent to which national and local regulations differ. Our data (table 5 in the appendix) show differences between sectors. Generally, while the national and local regulations of the short-term rental market differ slightly, the national and local regulations for TNCs like Uber mostly overlap (with the exception of Spain and Italy). This convergence shows that Uber is regulated predominantly at the national level. When a country bans the service nationally (as in Hungary), cities have no regulatory space to allow the service. In the case of short-term rental markets where Airbnb or Booking.com operate, cities have more regulatory space. No country has banned Airbnb and in 2019, ten countries did not adopt any regulation, eight had regulations in place to be enforced nationally, and eight countries created a new national framework to accommodate Airbnb.

We observe intriguing regulatory clusters that partially confirm the pre-existing administrative traditions, especially in the case of the ride-hailing sector. The regulatory outcomes for short-term accommodation are much more homogeneous across cities. The regulatory disruption is concentrated mostly in Southern and Western European cities. In this cluster, cities opted to enforce existing regulations or implement new regulations to accommodate ride-hailing platforms (in principle, two opposing outcomes). Those cities facing high levels of tourism and housing shortages introduced caps and compulsory registrations. Surprisingly, cities in the Anglo-Saxon model did not champion the free market and deregulation but closely followed the continental cluster. Irish and UK cities decided to enforce existing rules or were affected by regulatory disruption. Dublin required Uber to comply with the same rules as taxi drivers. London tried to force Uber to comply with the rules for taxi companies and put forward a few basic rules like day limits and registration requirements for Airbnb hosting.

Barcelona considered both platforms disruptive and the city´s regulatory battles

attracted substantive media coverage. The city set caps on the number of Uber cars and imposed a compulsory 15-minute waiting time before picking up a new client. Following Amsterdam's example, Barcelona created a cap on days that accommodation can be rented, stopped issuing new Airbnb licences in certain city areas, and handed many fines to the platform and hosts for not following local regulations. Portugal and Lisbon were at first enthusiastic promoters of the platform economy; in 2018, Portugal relaxed its taxi regulations and allowed Uber and other ride-hailing platforms to operate. Recently, Lisbon reversed its approach with Airbnb and implemented more restrictive regulations (caps, zoning, and a halt to new licences). In Germany, Uber was temporarily banned by a tribunal and subsequently legalised under a new regulatory framework that added specific categories and obligations for drivers of ride-hailing platforms (such as an obligation to return to headquarters after dropping off a client). Italy banned Uber and continues to limit access to the service. Still, cities are very lenient with Airbnb and only regulate the registration of hosts (previous national security regulation) and tourist taxes. Only recently have Venice and Florence debated limiting holiday rentals and Airbnb.

On the other hand, the local and national regulations of Nordic and Eastern European countries seem to be less disrupted. In 2019, Nordic cities followed the national strategy and rigorously enforced existing laws. This was probably a result of the early deregulation of the taxi market, strong emphasis on tax compliance (Thelen, 2018), and strict regulation of the housing sector (public housing and housing cooperatives). Cities in Eastern Europe form a very heterogeneous group that oscillates between two extremes: laissez-faire and banning. Cities in Hungary, Romania, the Czech Republic, and Poland do not regulate short-term rental platforms, with the exception of Krakow in Poland which created a voluntary registration scheme. In Hungary, Uber is banned, in Poland it is regulated ('Lex Uber' in 2021), and in Romania and Czechia, Uber operates without national restrictions but with varying degrees of acceptance by cities. While Uber operates without any restrictions in Prague (only a formal letter was sent to the company's management), Brno (the second largest Czech city) banned Uber a few days after it started operating.

Conclusions

Platform companies such as Uber and Airbnb were regarded by the media and policymakers as policy entrepreneurs, operating in the margins of existing regulatory frameworks and twisting regulations to their whims. However, the disruptive char-

acter of platform companies has rarely been confirmed empirically. While studies have focused on the practices and strategies of platform companies, only limited attention has been paid to how regulatory institutions respond and adapt to the challenges that these new actors pose for cities (Occhiuto, 2021; Valdez, 2023; Aguilera et al., 2021). This paper aimed to conceptualise and map the regulatory response to platform companies and their disruptiveness to local regulation in two sectors, 21 countries, and 99 cities between 2019 and 2022.

Our paper contributes to the literature in two ways. First, it adds to current empirical research, as it is (to our knowledge) the first comprehensive comparative analysis of the regulation of platform economy at this scale in Europe at the subnational level. Empirically, very few studies have systematically compared regulations across a large number of cities and sectors. This comparative approach allows us to distinguish to what extent local contexts and different institutional settings determine the effectiveness of platform entrepreneurs' institutional strategies (Uzunca et al., 2018). Second, it conceptualises and assesses the disruptiveness of these platforms vis-à-vis cities' regulatory frameworks.

We found that regulatory responses varied greatly between cities, sectors, and over time. In line with recent research that has shown how platform power is contingent, contextual, and contested, our research shows that cities stood their ground and their power increased over time. Comparing the institutional response across 99 cities and two sectors, we did not find that sectoral platforms emerged as prime regulatory disruptors. Although cities made numerous concessions, in half of the cases they stood their ground and chose to enforce regulations or ban those that failed to respect local rules. City governments' power over platforms has risen over time. This article presents an alternative way of conceptually understanding platform power and its limits; our findings are in line with other recent findings (Hajibaba & Dolnicar, 2018; Larsson et al., 2023; Van Doorn et al., 2021).

Moreover, we found clear differences between the two sectors — housing and transportation. Housing regulation was more disrupted, forcing half of cities to adapt their regulations. We ascribe this difference to the companies' different market strategies, pre-existing regulatory frameworks, and sector specificities. Uber invades cities and their roads while facing a clear adversary (taxi companies and taxi drivers' associations) while Airbnb colonises cities silently, slowly adding user numbers from the bottom up. Cities might first underestimate Airbnb's impact until it is too late, or not see the problem at all if there are no additional factors such as housing shortages or a large influx of tourists.

Additionally, we have uncovered an important time trend. Between 2019 and 2022, the regulatory disruptiveness of platforms declined significantly in both sectors. In other words, the platforms' power to significantly influence local regulation declined. This finding points to platform power as dynamic and dependent on political, economic, and social context. In his study of the German NetzDG[1] regulations, Gorwa (2021) showed how EU procedures, electoral competition, and government coalition marked strong path dependency and limited abrupt regulatory change. Our time trend resonates well with the results of a comparative study of Airbnb by Hajibaba and Dolnicar (2018). They showed that cities without regulations tightened their rules, while those with more stringent laws gradually opened up and included platforms. Our results, however, show the overall shift to enforcement of rules and the decline of the *laissez-faire* approach.

This research opens up several exciting research venues. It shows that platform power is not uniformly applied, constant in time, or unchallenged. This finding opens up the possibility of looking for divergence and convergence in regulatory approaches and the causes of this variation. Researchers have identified previous regulations, stakeholder mobilisation, size of the market, political salience, and consumer mobilisation among the factors that influence regulation. Our large sample of cities provides an excellent opportunity to test these theories on a larger sample. The data structure also allows for testing for the influence of national administrative styles or cultures on local administrative reactions.

However, this study also faces several limitations. Adapting regulations to accommodate the business models of platform companies might not be seen as disruptive, especially if the change is gradual. Regulation changes might not represent concessions to platforms, but a tightening of the conditions of their operation. These concerns are valid; however, the literature shows that most regulatory changes accommodate platforms and legitimise their operation (Collier et al. 2018; Mazur & Serafin, 2022). Even small concessions cemented in the regulation are relevant for further reform, and thus a sign of disruption. Also, our data show that both platforms continue to operate in the majority of cities that enforce existing regulations.

In using this subnational perspective, we are mindful of the multi-level character of platform regulation. Of particular interest is the role of the European Union, which acts as a key regulator shaping regulatory powers at the national and sub-

1. The Network Enforcement Act (NetzDG) is a German law that sets compliance rules, fines for privacy violations, and reporting requirements for social network providers.

national levels. In 2017, the CJEU challenged Uber's claim that Uber is a technology company that provides an app to its 'partner drivers', rather than an employer or even a transport company. This CJEU ruling prompted several lenient countries and cities to adopt regulation in 2018 and 2019, including Bulgaria and Slovakia. In 2025, an amendment to the Digital Market Act (DMA) on data sharing and registration of short-term rentals (STR) like Booking.com and Airbnb for tax and regulatory purposes will be implemented and harmonise the national regulation and data collection of STR. However, cities and countries will still be able to adopt more restrictive frameworks.

National regulation and laws also matter; not only by providing a framework defining what cities can and can't do, but also because cities and regions demand national legislative efforts in response to European case law and regulation. As our results show (table 5 in the appendix), platform regulation is a multi-level game in which local, regional, and national regulations tend to be interconnected. Future research should focus on the co-evolution of EU, national, and local regulation, investigating which level determines, leads, or implements the regulation. Collier et al. (2018) suggest that in the US, the local level leads to more restrictive regulation while the national level tries to pre-empt the local restrictive regulatory framework. Platform disruptiveness might also vary at the level of governance and the division of competencies; a labour platform might be more disruptive at the national level while a capital platform might be more disruptive at the local level. The distinctive impact on different levels of governance is yet to be addressed. Our results suggest that this might be important and could be a source of multi-level tensions between levels of government, used by platforms to play different levels of government off against each other.

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Appendix

TABLE 1: List of cities and countries in our sample

NAME	CODE	COUNTRY	YEAR
Poland	PL	1	2019
Warsaw	PL	0	2019
Kraków	PL	0	2019
Wroclaw	PL	0	2019
Poznan	PL	0	2019
Gdansk	PL	0	2019
Florence	IT	0	2019
Pisa	IT	0	2019
La Spezia	IT	0	2019
Genoa	IT	0	2019
Padova	IT	0	2019
Verona	IT	0	2019
Venice	IT	0	2019
Turin	IT	0	2019
Naples	IT	0	2019
Milan	IT	0	2019
Rome	IT	0	2019
Italy	IT	1	2019
Romania	RO	1	2019
Timisoara	RO	0	2019
Cluj	RO	0	2019
Bucharest	RO	0	2019
Oradea	RO	0	2019
Hungary	HU	1	2019
Budapest	HU	0	2019
Debrecen	HU	0	2019
Pecs	HU	0	2019

NAME	CODE	COUNTRY	YEAR
Spain	ES	1	2019
A Coruna	ES	0	2019
Alicante	ES	0	2019
Barcelona	ES	0	2019
Bilbao	ES	0	2019
Cadiz	ES	0	2019
Cordoba	ES	0	2019
Gijon	ES	0	2019
Palmas	ES	0	2019
Logrono	ES	0	2019
Madrid	ES	0	2019
Malaga	ES	0	2019
Murcia	ES	0	2019
Oviedo	ES	0	2019
Palma	ES	0	2019
Santander	ES	0	2019
Compostela	ES	0	2019
Sevilla	ES	0	2019
Toledo	ES	0	2019
Valencia	ES	0	2019
Valladolid	ES	0	2019
Vittoria	ES	0	2019
Zaragoza	ES	0	2019
France	FR	1	2019
Aix-en-Provence	FR	0	2019
Avignon	FR	0	2019
Bordeaux	FR	0	2019
Dijon	FR	0	2019
Grenoble	FR	0	2019
Lille	FR	0	2019
Lion	FR	0	2019
Marseille	FR	0	2019
Montpellier	FR	0	2019

NAME	CODE	COUNTRY	YEAR
Nantes	FR	0	2019
Nice	FR	0	2019
Paris	FR	0	2019
Reims	FR	0	2019
Rennes	FR	0	2019
Strasbourg	FR	0	2019
Toulon	FR	0	2019
Toulouse	FR	0	2019
Tours	FR	0	2019
Germany	DE	1	2019
Manheim	DE	0	2019
Heidelberg	DE	0	2019
Stuttgart	DE	0	2019
Nuremberg	DE	0	2019
Berlin	DE	0	2019
Munich	DE	0	2019
Leipzig	DE	0	2019
Dresden	DE	0	2019
Bremen	DE	0	2019
Czech Republic	CZ	1	2019
Praha	CZ	0	2019
Brno	CZ	0	2019
Ostrava	CZ	0	2019
Bratislava	SK	0	2019
Slovakia	SK	1	2019
Denmark	DK	1	2019
Copenhagen	DK	0	2019
Bulgaria	BG	1	2019
Sofia	BG	0	2019
Belgium	BEL	1	2019
Brussel	BEL	0	2019
Wien	AUS	0	2019
Austria	AUS	1	2019

NAME	CODE	COUNTRY	YEAR
Salzburg	AUS	0	2019
Dublin	IR	0	2019
Ireland	IR	1	2019
Cork	IR	0	2019
Sweden	SWE	1	2019
Stockholm	SWE	0	2019
Goteborg	SWE	0	2019
Netherlands	NL	1	2019
Amsterdam	NL	0	2019
Rotterdam	NL	0	2019
Portugal	PT	1	2019
Lisbon	PT	0	2019
Porto	PT	0	2019
United Kingdom	UK	1	2019
London	UK	0	2019
Manchester	UK	0	2019
Liverpool	UK	0	2019
Birmingham	UK	0	2019
Edinburg	UK	0	2019
Glasgow	UK	0	2019
Finland	FI	1	2019
Helsinki	FI	0	2019
Greece	GR	1	2019
Athens	GR	0	2019
Thessaloniki	GR	0	2019
Norway	NO	1	2019
Oslo	NO	0	2019

TABLE 2: Regulatory outcomes at the municipal level (pooled Uber and Airbnb regulatory outcomes) for years 2019 and 2022

	2019		2022	
REG. OUTCOME	FREQUENCY	SHARE (%)	FREQUENCY	SHARE (%)
New regulation	104	52.53	57	29.38

	2019		2022	
REG. OUTCOME	FREQUENCY	SHARE (%)	FREQUENCY	SHARE (%)
Enforce	40	20.20	99	51.03
Ban	11	5.56	14	7.22
Laissez-faire	43	21.72	24	12.37
Total	198	100	194	100

Source: Based on data from the REGULATE project.

TABLE 3: Regulatory outcomes at the municipal level by sector (Short-term rentals (Airbnb) and Ride-hailing (Uber)) for years 2019 and 2022

	SHORT-TERM RENTALS (AIRBNB)		RIDE-HAILING (UBER)	
	2019	2022	2019	2022
New Regulation	55.56	43.75	49.49	15.31
Enforce	21.21	40.63	19.19	61.22
Ban	0	2.08	11.11	12.24
Laissez-faire	23.23	13.53	20.20	11.22
Total	100.00	100.00	100.00	100.00

Source: Based on data from the REGULATE project.

TABLE 4: Regulatory disruptiveness at the municipal level by sector (Short-term rentals (Airbnb) and Ride-hailing (Uber)) for years 2019 and 2022

	SHORT-TERM RENTALS (AIRBNB)		RIDE-HAILING (UBER)	
	2019	2022	2019	2022
No regulatory disruption	44.44	56.25	50.51	84.69
Regulatory disruption	55.56	43.75	49.49	15.31
Total	100	100	100	100

Source: Based on data from the REGULATE project.

TABLE 5: Comparison of regulatory outcomes between local and national levels by sector (Short-term rentals (Airbnb) and Ride-hailing (Uber)) for years 2019 and 2022

	SHORT-TERM RENTALS (AIRBNB)		RIDE-HAILING (UBER)	
	CITY LEVEL	COUNTRY LEVEL	CITY LEVEL	COUNTRY LEVEL
Laissez-faire	36 (18.5)	13 (31.0)	31 (15.7)	6 (12.3)
Enforce	60	19	79	23

	SHORT-TERM RENTALS (AIRBNB)		RIDE-HAILING (UBER)	
	CITY LEVEL	COUNTRY LEVEL	CITY LEVEL	COUNTRY LEVEL
	(30.8)	(45.2)	(40.1)	(54.8)
Ban	2 (1.0)	0 (0.0)	23 (11.7)	3 (7.1)
New Regulation	97 (49.7)	10 (23.8)	63 (32.5)	10 (23.8)
Total	195 (100)	42 (100)	197 (100)	42 (100)

Source: Based on data from the REGULATE project.

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