



Copyright Protection in the Digital Single Market: Potential Consequences for Content Platform Competition

Frank Stähler¹ · Leander Stähler²

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Abstract

This paper scrutinizes the effects of the European Directive on Copyright in the Digital Single Market on platform competition. Platforms that are online content-sharing service providers must have a license agreement with collective management organizations that control the content platform that users may – or must not – upload to the platform. The paper shows that the new directive may imply market concentration and an aggregate welfare loss. The reason is that only users of the large platform (in a dual platform setting) will be allowed to upload content if the content assets are sufficiently valuable and if network effects are strong.

Keywords Copyright protection · IPRs · Content platforms · Digital services

JEL Classification D43 · F12 · L86

1 Introduction and Background

In this paper, we scrutinize the new role of collective management organizations (CMOs) as a result of the new Directive on Copyright in the Digital Single Market (CDSM).¹ The EU Collective Management Directive (CMD) defines CMOs as

¹ See Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC OJL 130/92.

✉ Frank Stähler
frank.staehler@uni-tuebingen.de

Leander Stähler
leandersamuel.staehler@kuleuven.be

¹ CESifo and NoCeT, School of Business and Economics, University of Tübingen, University of Adelaide, Nauklerstr. 47, D-72074 Tübingen, Germany

² Centre for IT and IP Law (CiTiP), KU Leuven, Sint-Michielsstraat 6, 3443, 3000 Leuven, Belgium

organizations that manage the intellectual property rights of rightholders². Importantly, they are representative for all rightholders of a domestic industry as long as an individual rightholder does not opt out.

Under the CDSM, Online Content-Sharing Service Providers (OCSSPs) are required to have the consent from rightholders of protected content or should have an agreement with CMOs. OCSSPs are *content platforms* that are a “...provider of an information society service whose main or one of the main purposes is to store and give the public access to a large amount of copyright protected works or other protected subject-matter uploaded by its users ...” (Art. 2, Sect. 5). This affects not only Facebook, YouTube and Instagram but any forum that is financed by advertisements, and includes any content upload.

We will scrutinize the potentially anti-competitive effects of the CDSM Directive. While it can be expected to increase the share of the surplus that accrues to the CMOs, we show that the CDSM Directive may increase the market power of a strong content platform, even if the CMO does not in principle refuse to license to other content platforms. If a license agreement is profitable only for a large platform, small-scale content platforms may have to make provisions so that copyright-protected content is not uploaded, which will reduce their platform benefit.

We show in particular that a most-favored-customer (MFC) provision – which is part of the CDSM Directive – may make an alliance of a CMO with a single, large content platform stronger, while also reducing aggregate welfare. Our results will not depend on the specific type of contracts that are offered by the CMO, as long as the MFC provision guarantees that both platforms are offered the same menu of contracts.

1.1 Related Literature

Our analysis contributes to the literature on platform competition in media markets, and many papers have investigated their performance in two-sided markets.³ We focus on the network externality of media markets, and we do so to be able to investigate the role of the CMO as a monopolist that controls an intangible asset that contributes to the quality of the platform.

In this respect, our analysis is close to papers that consider the role of quality in media markets.⁴ However, in these papers, quality provision is an endogenous choice of a platform; in our case, it is the CMO that either has a contractual arrangement

² See Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market, for which we use the acronym CMD for Collective Management Directive.

³ See, for instance, Anderson and Coate (2005), Armstrong (2006), Caillaud and Jullien (2001, 2003), Calzada and Valletti (2008), Crampes et al. (2009) Hagiu (2006), Rochet and Tirole (2003, 2006).

⁴ See, for example, (Armstrong and Weeds 2007), Battaglion and Drufuca (2020), Kind et al. (2013), Li and Zhang (2016), Lin (2011).

with a platform or not. At least in the short run, the size and quality of these assets are given.⁵

Our paper also contributes to the literature on exclusion, and part of this literature deals with licensing in vertical product markets and considers the trade-off between exclusion and non-exclusion (see Li and Wang 2010). While potential exclusion has been extensively discussed in the literature in different contexts (see, for example, Motta 2015 Chapter 7), there is no analysis yet on the role of CMOs as representatives of rightholders vis-à-vis content platforms. This paper fills this gap.

There is also a substantial literature on the role of intellectual property rights in digital markets due to the non-rival nature of digital information – in particular on the music industry (see, for example, Section 4.3 in Goldfarb and Tucker (2019), and the cited literature). An older literature has scrutinized the role of CMOs. This literature regards CMOs as natural monopolies due to decreasing average costs of managing content.⁶ In our context, CMOs are *de facto* monopolists.

There is also a similarity of our analysis with the analysis of media platforms that hold exclusive broadcasting rights – for example, for sport events (see Gratton and Solberg 2007). Copyright protection is not an issue in this case as the platform has acquired the broadcasting rights. The difference for our paper is that the CDSM Directive deals with content platforms that allow users to *upload* potentially copyright-protected content. We now present the key features of the CDSM Directive that are relevant for our analysis.

1.2 The Directive on Copyright in the Digital Single Market (CDSM)

Arguably, no other intellectual property right (IPR) discussion has stirred the EU as much as the CDSM. Critics accuse it of threatening internet freedom, or even imposing a form of censorship (see Stolton 2019), whilst proponents see it as an important step in ensuring the protection of IPR in the digital world (see European Commission 2019). Central to this discussion has been the so-called “upload filter” that content platforms may use to control online content. These upload filters are seen as a restriction of internet freedom because their algorithm may also block content that is not violating IPRs.

More importantly for our analysis, the CDSM Directive imposes a burden of proof on a content platform that it has sought an agreement with rightholders for any kind of content that may be uploaded by the platform’s users. Under Art. 12 of the DSM Directive,⁷ Member States may grant CMOs a presumed mandate as

⁵ In this sense, it makes a difference whether a media platform offers high-quality content, that is, can produce by itself or source from somewhere, or whether its users are allowed to upload news, videos, photos, etc. to share on a platform. It is the latter case that the CDSM Directive addresses, while platforms also offer self-produced or free content.

⁶ See, for example, Besen et al. (1992), Hollander (1984). Katz (2005) has challenged the view that CMOs are natural monopolies.

⁷ See Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, for which the acronym DSM for Digital Single Market Directive is used. Most Member States have adopted Article 12.

rightholders; this effectively elevates them to a one-stop-shop for certain authorizations and makes them *de facto* monopolists in certain European markets. Subject to this legislative option, content platforms of all sizes will need to seek authorization from CMOs for communications to the public.⁸

The difficulty to monitor the detailed content that is uploaded by users implies so-called *blanket licenses* such that any agreement will allow users of the platform to use all content managed by the CMO, and not only part of it. Blanket licenses are universal in these markets, also because it is impossible or at least very costly to control for content selection in digital markets.⁹

Furthermore, the CMD Directive imposes a most-favored-customer (MFC) provision:¹⁰ Any offer, or any set of offers, must be made to all platforms. This MFC rule is very similar to a ban on price discrimination as it does not allow platforms to charge different blanket license fees to different platforms. Usually, these bans are introduced as a measure to guarantee “fairness”, and the CMD Directive is no exception.

While the CDSM Directive is one of the first legal frameworks in this context, the political debate has gained momentum in other countries – in particular in Australia and the US.¹¹ Australia has introduced legislation under which Facebook and Google have to compensate media outlets for news content that they use. Also in the US, there is a growing concern that these platforms do not compensate media outlets properly.

In response to a study by the News Media Alliance that claims that Google made USD 4.7 billion by using news content of media outlets for free,¹² the US Congress has introduced a bill that would grant news publishers an antitrust exemption for four years. They would be allowed to negotiate collectively with content platforms about models of compensation and revenue sharing which would put them in a similar position as the CMOs in Europe.¹³ Google and Facebook have responded to this bill that they are merely redirecting to media outlets, and that those media outlets actually benefit from this.

⁸ For more details, we offer a thorough and comprehensive overview of the CDSM Directive, the new role of the CMOs, and its potential implications for competition policies in Stähler and Stähler (2022).

⁹ Even before digitization, CMOs offered blanket licenses only. For example, CMOs that manage music rights would employ a model of royalties per music track, and radio stations would have to produce a play list; but CMOs did not offer to use only a subset of the rights they manage. This practice has also been ruled compliant with antitrust law in the US; see *Broadcast Music v. Columbia Broadcasting System*, 441 U.S. 1 (1979).

¹⁰ CMD Article 16(2): “Licensing terms shall be based on objective and non-discriminatory criteria.”

¹¹ See *New York Times*, ‘Australia Moves to Force Google and Facebook to Compensate Media Outlets’, April 20, 2020, and *New York Times*, ‘Big Tech Has Crushed the News Business. That’s About to Change’, May 10, 2020.

¹² See “Google Benefit from News Content”, Economic Study by News Media Alliance, June 2019.

¹³ See *New York Times*, ‘Google Made \$4.7 Billion From the News Industry in 2018, Study Says’, June 9, 2019, and for the bill introduced, see Journalism Competition and Preservation Act of 2019, 116th Congress (2019-2020).

Taken together, an analysis is required that scrutinizes the role of CMOs as monopolists that potentially sell blanket licenses to content platforms under an MFC provision. Consequently, the remainder of this paper is organized as follows: Section 2 develops a Hotelling model of content platform competition that is extended to include network externalities and the benefits for users if they have access to licensed content that is controlled by a CMO. Section 3 shows how the CDSM Directive may lead to substantial industry concentration, and section 4 scrutinizes the effect on aggregate welfare. Section 5 concludes.

2 A Model of Content Platform Competition

In order to model the effects of the CDSM Directive on potential competition, we employ a Hotelling model that is extended to include platform externalities and the quality of allowed content upload. We use a Hotelling model because these models imply only moderate social welfare effects, if any, if the market is fully covered. Thus our analysis stacks the deck against negative welfare effects – which we nevertheless will find.

In more detail, we use a single-homing model of two-sided platform competition in which platforms attract users on one side by offering free platform access and sell advertisements to firms on the other side.¹⁴ There are two content platforms: Platform 1 is located at location 0; and platform 2 is located at location 1. Both platforms potentially pay fees F_1 and F_2 , respectively, for blanket licenses to the CMO, which allow users to upload content.

W.l.o.g. we set marginal platform costs equal to zero, so platform profits are given by

$$\pi_1 = d_1(\cdot)a_1 - F_1 \text{ and } \pi_2 = d_2(\cdot)a_2 - F_2, \quad (1)$$

respectively, where a_i denotes the ad revenue of platform i per viewer and: (i) a_i is a disutility to users; and (ii) a_i is not a real resource input but a payment from advertisers to the platform. $d_1(\cdot)$ is the demand of platform 1, and $d_2(\cdot)$ is the demand of platform 2, to be determined below.

Furthermore, we consider a competitive advertising market in which advertisers can choose among a large number of outlets (newspapers, TV stations, etc.) in addition to the two platforms such that the ad price per unit and user is fixed to unity. This assumption allows us to focus on the role of network externalities, and we do not have to take a stance on the details how advertisers and consumers interact on the advertising market – in particular, whether the level of advertising is socially too small or too large.¹⁵

¹⁴ Appendix A.1 shows how our results extend to user prices, monopolization and multi-homing.

¹⁵ In general, this welfare effect would require further assumptions on the effect of advertising, that is, whether advertising is informative as in Peitz and Valletti (2008) or can be excessive. For a model of excessive versus too small ad levels, see Becker and Murphy (1993).

Before the game starts, potential platform users draw their location on the Hotelling line from a distribution in which they are uniformly distributed between 0 and 1. Their size is normalized to unity. Users can switch without cost from one platform to the other,¹⁶ and their payoff from using the platform depends on their location, the number of users of the platform, the disutility of being exposed to advertising, and whether the platform has an agreement with a CMO.

As is usual in this strand of the literature, the location determines the disutility of the platform not being a perfect match for the user. In particular, a user at location $x - x \in (0, 1)$ – who uses platform 1 enjoys a net payoff of

$$u_1(x) = v + \mu y - \frac{\mu y^2}{2} + \theta C_1 - t_1 x - a_1. \quad (2)$$

In order to keep the analysis as simple as possible, we have chosen a utility specification in the tradition of Hotelling models in which utility is additive.¹⁷ $v, v \geq 0$, denotes the gross payoff of using any platform irrespective of the number of users and may include information services that are provided by the platform and purpose-created content – for example, by social media stars and influencers. In the main part of our analysis, we assume that v is large enough to imply full coverage and competition; later on, we will also consider $v = 0$.

C_1 is the content level that the agreement with the CMO allows platform 1 to use where θ measures the marginal utility of this content. Let C denote the size of the content that is controlled and managed by the CMO. It is of benefit for platform 1 users such that θC_1 adds a vertical differentiation dimension to the horizontal dimension of Hotelling models.¹⁸ Due to blanket licenses, either $C_1 = 0$ or $C_1 = C$.

Platform 1 realizes revenues on the other side of the market on which it sells ads to firms. The level of ads, a_1 , is a nuisance for users, and the disutility from the match incompatibility is given by $t_1 x$. Finally, $\mu y - \mu y^2/2$ measures the platform's network externality for all users where y – to be determined endogenously – denotes the number of users of platform 1.

Note that the marginal effect of an additional user is positive, but decreasing with y and maximal for $y = 1$: If the platform is a monopolist. μ measures the contribution

¹⁶ De Bijl and Goyal (1995) develop a model in which duopolists decide on innovation and compatibility, but they assume a fixed customer base for each (incompatible) standard. Content platforms are internet-based platforms, and hence incompatibilities cannot play a role in this context.

¹⁷ Although our model allows platforms to attract users even without any content, our model will imply two important features: (i) network effects make competition more fierce; and (ii) an increase in content will increase the maximized profits of a platform and decrease those of the rival platform.

¹⁸ We could consider the CMO also as a platform as it is the stronger the more content it manages; but since CMOs are *de facto* monopolists, they do not have to fight for market shares as content platforms have to. Thus, issues of network interconnectivity and pricing in the context of two-sided platform competition as discussed for example by Armstrong (1998) and Calzada and Valletti (2008) do not arise here.

of this positive network externality to the user's payoff. The more users that platform 1 attracts, the larger is the benefit for each user.

Similarly, a user at location x who uses platform 2 enjoys a net payoff of

$$u_2(x) = v + \mu(1 - y) - \frac{\mu(1 - y)^2}{2} + \theta C_2 - t_2(1 - x) - a_2. \quad (3)$$

Importantly, we allow the two platforms to have different match qualities for users. In particular we assume that $\mu < t_1 \leq t_2$ and $t_1 + t_2 - 3\mu > 0$, which means: (i) network effects are not too strong to imply a natural monopoly; and (ii) platform 1 has a natural cost advantage in reaching out to more users.

This will allow us to consider asymmetries in market sizes; platform 2 could then be regarded as a niche platform – for example, a forum, that aims to serve only some users with special interests – while platform 1 is a standard platform such as Facebook, YouTube, or Instagram.¹⁹ The Commission will have to review the impact of the CDSM Directive on content platforms with a turnover below €10 million, and our model thus has to accommodate differences between platforms in terms of their market potential.

We now consider a three-stage game in which the CMO's objective is to maximize the revenues from license agreements with one or both platforms. A CMO represents its members or owners (and foreign rightholders through representation agreements) such that it returns all proceeds net of administration cost to rightholders, but it has no direct control over the quality and size of the content. While this qualifies CMOs as not-for-profit organizations, their objective is clearly to maximize the income for the rightholders that they represent.

In particular, the CMO negotiates with both platforms, and the outcome is a set of offers in the first stage. Without a most-favored customer (MFC) provision, the CMO can make different offers to both platforms, and can do so in private conversation with each platform. With an MFC provision, however, all offers must be made to both platforms.

In the second stage, each platform accepts an offer – or none – and in the third stage the two platforms compete by selling ads and attracting users. Table 1 shows the structure of the game.

We solve the game in the usual backward induction fashion, and we do so for stage 3 for given content agreements: C_1, C_2 . No agreement means $C_i = 0$: In this case, platform i will have to make provisions that guarantee that its users do not violate the CMO's and possibly the other platform's copyrights. Since the CMO offers a blanket license, any agreement implies $C_i = C$.

We start with the case in which both platforms have strictly positive demands: $0 < d_i < 1$. All users will use either platform 1 or 2 if the market is completely covered. In equilibrium, d_1 is equal to y and is determined by the indifferent consumer \bar{x} for whom $u_1(\bar{x}) = u_2(\bar{x})$ and which yields

¹⁹ Note that these well-known platforms are not monopolists. For example, there are a number of alternative video-sharing platforms that compete with YouTube, but their market shares are comparably small.

Table 1 Game structure

| | |
|-------------------|---|
| <i>Stage I:</i> | The CMO negotiates with both platforms and makes one or more offers to each platform. |
| <i>Stage II:</i> | Each platform accepts one offer or declines them all. |
| <i>Stage III:</i> | Both platforms sell ads and realize demands. |

$$d_1 = \bar{x} = y(a_1, a_2) = \frac{2t_2 - \mu + 2\theta(C_1 - C_2) - 2(a_1 - a_2)}{2(t_1 + t_2 - \mu)} \quad (4)$$

and $d_2 = 1 - y(a_1, a_2)$. Since the size of users is normalized to unity, $y(a_1, a_2)$ is also platform 1's market share, and $1 - y(a_1, a_2)$ is platform 2's market share.

Eq. (4) shows that each platform demand depends positively on the difference in its content access compared to the rival and negatively on the difference between its ad level and the rival's ad level. Consequently, profit maximization of (1) yields equilibrium ad levels

$$\begin{aligned} a_1^*(C_1, C_2) &= \frac{1}{6}(2\theta(C_1 - C_2) + 2t_1 + 4t_2 - 3\mu), \\ a_2^*(C_1, C_2) &= \frac{1}{6}(2\theta(C_2 - C_1) + 4t_1 + 2t_2 - 3\mu), \end{aligned} \quad (5)$$

respectively.²⁰

What happens if network effects become larger? If μ increases, both platforms fight more fiercely for market shares by reducing the effect of ad nuisance for users, which implies a smaller ad level.

The equilibrium market share of platform 1 is given by

$$y^*(C_1, C_2) = \frac{1}{2} + \frac{2\theta(C_1 - C_2) - (t_1 - t_2)}{6(t_1 + t_2 - \mu)}. \quad (6)$$

Eq. (6) allows us to be more precise on our assumption of strictly positive market shares of both platforms. In what follows, we will show that the CMO will always make a deal with platform 1 as this platform can reach out further than platform 2. Hence $C_1 - C_2$ is either equal to C for a *de facto* exclusive deal with platform 1 or equal to zero if both platforms get a deal. Thus, $y^* \geq 1/2$, and the condition $y^* \leq 1$ for $(C_1, C_2) = (C, 0)$ requires

$$C \leq \bar{C} = \frac{4t_1 + 2t_2 - 3\mu}{2\theta} \geq 0. \quad (7)$$

²⁰ We extend the model in Appendix A.2 to flexible ad pricing such that each platform faces a downward-sloping demand curve, and we show that our results generalize if demand is not too elastic. Appendix A.2 shows that a too elastic demand leads to small ad levels and platform profits (even for platform 1) and thus reduces the exclusion incentive, but makes monopolization more likely.

If condition (7) is fulfilled, platform 2 will stay active in the market if the CMO has a deal with platform 1 only. If condition (7) is not fulfilled, platform 2 will stay active only if the CMO is willing to come to an agreement with both platforms. If it will not have an agreement with platform 2, platform 2 will leave the market. This case is equivalent to platform 1 monopolizing the market. We will not consider this case further in the main body of the paper, but deal with it in Appendix A.1.

So far, our analysis has assumed that v is large enough to guarantee full coverage. It may be held against this assumption that these platforms are of any value for users only if other users can be reached. If $v = 0$, a platform can be beneficial only for users if these users (rationally) expect other users to join the same platform. $v = 0$ does not exclude full coverage, but requires that the user who is indifferent between using platform 1 or platform 2 realizes a positive payoff.

It is straightforward to develop the minimum size of the content asset such that full coverage of the market by both platforms will emerge if $C_1 = C_2 = C$ (see Stähler and Stähler 2022). Not surprisingly, if $C_1 = C$ and $C_2 = 0$, the market will not be fully covered by both platforms but monopolized by platform 1. Thus, the game is changed more substantially in favor of platform 1 when it is only platform 1 that has an agreement with the CMO if we include the possibility that the market may not be fully covered.

Without any copyright protection, both platforms would be active and allow users to upload content. This is the benchmark for platform competition without the CDSM Directive: Both platforms will be able to appropriate the surplus that arises from content use completely. We now explore when and how this directive does not only change the surplus division, but may also lead to a shift in market power.

3 Licensing Incentives Under the CDSM Directive

We now turn to the first two stages of the game after which each platform either comes to an agreement with the CMO or has to make provisions that prevent the upload of copyright content on this platform. The CMO is in no way bound to offer deals that will be accepted by all platforms. It should be clear that a platform that does not allow its users to upload copyright-protected content will be at a disadvantage.

In what follows, we assume that the size of the assets that the CMO controls does not change with the CDSM Directive: We do not consider that rightholders may want to increase C in order to make content more attractive for platforms. We will discuss at the end of section 4 how an endogenous response may change our results.

The CDSM Directive would have no effect on the market performance if the CMO came to agreements with both platforms. This can be seen directly from the profits (1): License fees F_1 and F_2 are a fixed cost and will not affect the optimal advertising strategies of both platforms. So, in this case, the directive would have an effect only on the surplus division. Without the directive, the platforms could appropriate all of the surplus; and if they both come to an agreement with the CMO,

they will have to share part of the surplus with the CMO, but nothing would change for users.

Thus, the CDSM Directive will have an effect beyond surplus division only if one platform comes to an agreement with the CMO, but the other does not. We now examine under which conditions the CDSM Directive may lead to a larger industry concentration as a result. Most importantly, the CMD Directive imposes a most-favored-customer (MFC) provision. This MFC rule is very similar to a ban on price discrimination, since it does not allow a CMO to charge different blanket license fees to different platforms.

We now compare the surplus that the CMO can create with platform 1 with the surplus that it can create with both platforms. Importantly, we will show that the MFC provision will actually support the shift in market power if the CMO prefers to have an agreement with platform 1 only. Thus, we will be able to show that an agreement with platform 1 will be *de facto* exclusive even if it could also be accepted by platform 2 under the same terms.²¹

Both the CMO and the two platforms anticipate the maximized profits correctly as they may arise from the different licensing arrangements. We conduct our analysis for $v > 0$; if $v = 0$, any *de facto* exclusive deal will imply monopolization. From (5) and (6), the maximized profits net of potential license fees are given by

$$\begin{aligned}\pi_1^*(C_1, C_2) &= \frac{(2\theta(C_1 - C_2) + 2t_1 + 4t_2 - 3\mu)^2}{36(t_1 + t_2 - \mu)}, \\ \pi_2^*(C_1, C_2) &= \frac{(2\theta(C_2 - C_1) + 4t_1 + 2t_2 - 3\mu)^2}{36(t_1 + t_2 - \mu)},\end{aligned}\quad (8)$$

respectively. Since the CMO can realize revenues only if it has a license agreement with at least one platform, we will never find $C_1 = C_2 = 0$ in equilibrium.

Suppose for now that the CMO is able to have an exclusive agreement with platform 1 only. The maximum willingness of platform 1 to pay for this exclusive deal is given by

$$\pi_1^*(C, 0) - \pi_1^*(0, 0) = \frac{\theta C(\theta C + 2t_1 + 4t_2 - 3\mu)}{9(t_1 + t_2 - \mu)}.\quad (9)$$

In this case, platform 1's outside option is to reject this deal and realize a profit for which $C_1 = C_2 = 0$. Equation (9) also shows that such an exclusive deal will be with the stronger platform 1 if the bargaining protocol implies that a larger surplus will also give the CMO a larger revenue: since $2t_1 + 4t_2 \geq 2t_2 + 4t_1$, $\pi_1^*(C, 0) - \pi_1^*(0, 0) \geq \pi_2^*(0, C) - \pi_2^*(0, 0)$.

²¹ In a different context of oligopoly, MFC provisions are known to lead to less competition. See, for example, Schnitzer (1994). An MFC provision is also a commitment device for a monopolist that produces a durable good, so as to escape from the outcome of the Coase Conjecture.

Of course, $\pi_1^*(C, 0)$ can be realized only if platform 1 can trust that the other platform will not accept any deal. If the CMO licenses to both platforms, the maximum willingness of the platforms to pay for a deal with the CMO when the rival platform also has a license is respectively given by

$$\begin{aligned} \pi_1^*(C, C) - \pi_1^*(0, C) &= \frac{\theta C(2t_1 + 4t_2 - 3\mu - \theta C)}{9(t_1 + t_2 - \mu)}, \\ \pi_2^*(C, C) - \pi_2^*(C, 0) &= \frac{\theta C(2t_2 + 4t_1 - 3\mu - \theta C)}{9(t_1 + t_2 - \mu)}. \end{aligned} \tag{10}$$

Note that the assumption of positive market shares implies that these expressions are positive. In that case, the outside option of each platform is not to have a deal with the CMO, while the other platform has a license. The surplus that the CMO can create with both platforms is given by $[\pi_1^*(C, C) - \pi_1^*(0, C)] + [\pi_2^*(C, C) - \pi_2^*(C, 0)]$.

If the CMO could credibly commit to not selling to the other platform, it would be able to create an even larger surplus than (9). For example, auctioning off exclusive rights would yield $\pi_1^*(C, 0) - \pi_1^*(0, C) > \pi_1^*(C, 0) - \pi_1^*(0, 0)$. But this is not credible: Without an MFC provision, platform 1 would correctly anticipate that the CMO will also make a deal with platform 2 as long as this yields a positive surplus, which it does given that $\pi_2^*(C, C) - \pi_2^*(C, 0) > 0$.

With an MFC provision, the CMO has to offer the same deal(s) to both platforms, and platform 1 will correctly anticipate whether platform 2 accepts any deal or not. Thus, the surplus comparison is between (9) and (10). We find:

Proposition 1 *The surplus of an exclusive agreement under an MFC provision is larger than the surplus of agreements with both platforms if*

$$C > \underline{C} = \frac{4t_1 + 2t_2 - 3\mu}{3\theta}.$$

Proof An exclusive deal with platform 1 yields a larger profit than a deal with both platforms only if $\pi_1^*(C, 0) - \pi_1^*(0, 0) - [\pi_1^*(C, C) - \pi_1^*(0, C)] - [\pi_2^*(C, C) - \pi_2^*(C, 0)] > 0$ which requires

$$\frac{\theta C(3\theta C + 3\mu - 4t_1 - 2t_2)}{9(t_1 + t_2 - \mu)} > 0.$$

Note that this condition and condition (7) are not mutually exclusive because $\underline{C} < \bar{C}$. □

Proposition 1 shows that the joint surplus is maximal for the CMO and platform 1 if $C > \underline{C}$. Note that the requirement for $C > \underline{C}$ is less binding with an increase in μ . Thus, an exclusive deal is more attractive when the content asset is larger and the network effect is stronger.

Whether and how the CMO can achieve this outcome depends on the bargaining protocol of the game. Instead of going into the details of different bargaining protocols, we want to emphasize the role of the MFC provision.²² The MFC provision enables the CMO credibly to commit to an offer that will be accepted by the large platform, correctly anticipating a *de facto* exclusive deal, but rejected by the small platform.

In particular, suppose that the CMO wants to have an agreement with platform 1. On the one hand, with a binding MFC provision, if the CMO wants to include platform 2 as well, it will receive a maximum revenue of $\pi_2^*(C, C) - \pi_2^*(C, 0)$ from platform 2 and would have to offer the same deal to platform 1. Hence the maximum revenue of the CMO is given by $2[\pi_2^*(C, C) - \pi_2^*(C, 0)]$ if it were to license to both platforms under the MFC provision.

On the other hand, any larger revenue that it can get from platform 1 exclusively will make the CMO prefer an exclusive licensing agreement with platform 1. Since the license fee must be larger than $2[\pi_2^*(C, C) - \pi_2^*(C, 0)]$, platform 2 will find accepting the same agreement unprofitable. Thus, we find:

Lemma 1 *If (i) $C > \underline{C}$, (ii) an MFC provision applies, and (iii) the bargaining protocol implies that the CMO realizes a revenue that is not smaller than $2[\pi_2^*(C, C) - \pi_2^*(C, 0)]$ in a licensing agreement with platform 1, then platform 1 will be the sole license holder.*

Note carefully that Lemma 1 gives a sufficient condition as it assumes that the CMO could get the maximum surplus when it deals with both platforms. Furthermore, if the CMO realizes a revenue larger than $2[\pi_2^*(C, C) - \pi_2^*(C, 0)]$, it can still claim that it does not refuse to license as it offers the same license agreement to both platforms; but the license agreement is *de facto* exclusive as the agreement is not profitable for the smaller platform to accept. Platform 1 will benefit from such a deal as $2[\pi_2^*(C, C) - \pi_2^*(C, 0)] < [\pi_1^*(C, C) - \pi_1^*(0, C)] + [\pi_2^*(C, C) - \pi_2^*(C, 0)] < \pi_1^*(C, 0) - \pi_1^*(0, 0)$ (see Proposition 1).

Excluding platform 2 can be done in different ways that are not confined to a fixed fee. It could also be done by a more complex fee structure – for example, based on platform traffic – as long as the best offer for platform 1 implies a CMO revenue that is not smaller than $2[\pi_2^*(C, C) - \pi_2^*(C, 0)]$ and the best offer for platform 2 is still unacceptable for this platform.

²² One simple bargaining protocol could be that the CMO makes a take-it-or-leave-it-offer to both platforms, but this not the only bargaining protocol that may lead to *de facto* exclusion.

4 Welfare effects

What are the welfare implications of a potential shift in market power? In symmetric Hotelling models, all users are served, and prices do not distort demand but shift profits from users to firms. Furthermore, the indifferent user is located exactly in the middle in equilibrium and thus the aggregate match incompatibility costs are minimized. Therefore, these standard symmetric models are Pareto-optimal, but we now show that this is not true in our asymmetric model.

Aggregate welfare is the sum of the user payoffs, of the two platform profits, and of the CMO revenue.²³ Due to a competitive ad market, we do not need to include any welfare effects on advertisers and consumers. Since we assume that marginal costs are zero, revenues are equal to profits; and since revenues are equal to user nuisance costs, they cancel out when computing aggregate welfare. Consequently, aggregate welfare is given by

$$W(C_1, C_2, y(C_1, C_2)) = v + \int_0^{y(C_1, C_2)} \left(\theta C_1 - t_1 x + \mu y - \frac{\mu y^2}{2} \right) dx + \int_{y(C_1, C_2)}^1 \left(\theta C_2 - t_2(1-x) + \mu(1-y) - \frac{\mu(1-y)^2}{2} \right) dx,$$

where $y(C_1, C_2)$ denotes the demand for platform 1 that depends on the content assets that both platforms are allowed to use under platform competition. The first-best outcome requires that all users are able to use the CMO asset, so $C_1 = C_2 = C$ must hold. We can write

$$\Omega(y) = W(C, C, y(C, C)) = v + \frac{1}{6} (6\theta C - 3t_1 y^2 - 3t_2(y-1)^2 + \mu(9(y-1)y + 5))$$

for aggregate welfare as a function of the market share of platform 1 if $C_1 = C_2 = C$. Differentiation yields

$$\frac{d\Omega(y)}{dy} = -\frac{3\mu}{2} - (t_1 + t_2)y + t_2 + 3\mu y, \quad \frac{d^2\Omega(y)}{dy^2} = -(t_1 + t_2 - 3\mu) < 0$$

such that the socially optimal market share, denoted by \tilde{y} , is given by

$$\tilde{y} = \frac{2t_2 - 3\mu}{3(t_1 + t_2 - 3\mu)} \geq y^*(C, C) = \frac{1}{2} + \frac{t_2 - t_1}{6(t_1 + t_2 - \mu)}. \tag{11}$$

The socially optimal market share is larger than $y^*(C, C)$ because

²³ As was outlined in section 2, all users do not know their locations before the game starts; and since the size of users is normalized to unity, their *ex ante* expected payoff is equal to the sum of the user payoffs.

$$\tilde{y} - y^*(C, C) = \frac{t_2^2 - t_1^2}{3(t_1 + t_2 - \mu)(t_1 + t_2 - 3\mu)} \geq 0. \quad (12)$$

Thus, Eq. (11) shows that the socially optimal market share of platform 1 is larger than the one under platform competition if $C_1 = C_2 = C$. The reason is that platform 2 has an incentive to make up for its match disadvantage by reducing its ad level a_2 substantially, and this effect leads to a socially excessive market share of platform 2. The incentive to reduce a_2 increases with the importance of network externalities as (12) increases with μ . Thus, when considering the potential welfare effects of the CDSM Directive, we compare two distorted outcomes with each other.

We now compare aggregate welfare under the alternative licensing environments that are given by (5) and (6) for $C_2 = C$ or $C_2 = 0$, respectively, when $C_1 = C$. If the CMO has an agreement with both platforms – $C_2 = C$ – welfare is equal to

$$W(C, C, y^*(C, C)) = v + \frac{1}{72} \left(8(9C\theta + 4\mu - 3t_1) + \frac{5(2t_1 - \mu)^2}{t_1 + t_2 - \mu} - 4t_2 \right),$$

and if it has an agreement only with platform 1 – $C_2 = 0$ – welfare is given by

$$W(C, 0, y^*(C, 0)) = v + \frac{1}{72} \left(8(7C\theta + 4\mu - 3t_1) + \frac{5(2C\theta + \mu - 2t_1)^2}{t_1 + t_2 - \mu} - 4t_2 \right).$$

Taking the difference yields

$$W(C, C, y^*(C, C)) - W(C, 0, y^*(C, 0)) = \frac{\theta C(14t_1 + 4t_2 - 5\theta C - 9\mu)}{18(t_1 + t_2 - \mu)},$$

which is positive if

$$C \leq C' = \frac{14t_1 + 4t_2 - 9\mu}{5\theta}.$$

Thus, if $\bar{C} \leq C'$, welfare will unambiguously decline with exclusion. $\bar{C} \leq C'$ if $4t_1 - t_2 - 3\mu/2 \geq 0$. We summarize this finding in

Proposition 2 *Assume that $v > 0$ and both platforms are active: If $t_2 < 4t_1 - 3\mu/2$, aggregate welfare declines if only platform 1 has an agreement with the CMO. If $t_2 > 4t_1 - 3\mu/2$, a critical*

$$C' = \frac{14t_1 + 4t_2 - 9\mu}{5\theta} \in [\underline{C}, \bar{C}]$$

exists such that aggregate welfare decreases (increases) if only platform 1 has an agreement with the CMO if $C < (>)C'$.

The intuition that underlies Proposition 2 is the following: If both platforms acquire a blanket license, their policies do not change, users are unaffected and only the surplus division between the CMO and the platforms is affected. If only the large platform 1 acquires a blanket license, the distortion of the too-small market share of platform 1 is eliminated. But for t_2 that is not too large compared to t_1 and $C_2 = 0$, the market share of platform 1 is now excessively large, and platform 2 users no longer have access to C .

Welfare may increase if and only if C is large and t_2 is very large compared to t_1 . The reason is that the large platform can host most users more efficiently if the content asset is large and if the mismatch costs of platform 2 are substantially larger than those of platform 1.

What about the licensing incentives if $\nu = 0$? Not surprisingly and due to monopolization, the maximized profit of platform 1 is larger compared to the case of competition. Thus, the incentive to have an exclusive deal with the CMO is even stronger for both platform 1 and the CMO compared to the case of a large ν . Furthermore, aggregate welfare declines if t_2 is not too large, even if platform 1 serves all users (for an explicit derivation of these results, see Stähler and Stähler 2022).

Our analysis has taken the size of the content asset that is controlled by the CMO as given. A common case for IPR protection is that it may incentivize right-holders to increase content. The effect of this will depend on how the CMO will redistribute its revenue to individual rightholders and how strong the incentive will thus be for each rightholder to increase C .

We do not explicitly model this effect, but it should be clear that an increase of C will also come with a cost to be carried by rightholders. If C increases as a consequence and both platforms have an agreement, aggregate welfare will increase because C will increase only if the additional cost is smaller than the additional CMO revenue.

However, if $C > \underline{C}$ or may even be lifted beyond \underline{C} and t_2 is not too large compared to t_1 , only platform 1 users will benefit from the content increase. Let $C^0(C^1)$ denote the content size before (after) the CDSM Directive. We find:

Proposition 3 *If $\underline{C} < C^0 < C^1 < \bar{C}$, an aggregate welfare improvement requires*

$$\frac{C^1}{C^0} > \frac{36(t_1 + t_2 - \mu)}{33(t_1 + t_2 - \mu) - 5(t_1 - t_2)}.$$

Proof

$$W(C^1, 0, y^*(C^1, 0)) - W(C^0, C^0, y^*(C^0, C^0)) = \frac{\theta C^1 (14t_1 + 4t_2 + 5\theta C^1 - 9\mu)}{18(t_1 + t_2 - \mu)} - \theta C^0,$$

which is positive if

$$\frac{C^1}{C^0} > \frac{18(t_1 + t_2 - \mu)}{14t_1 + 4t_2 + 5\theta C^1 - 9\mu} > \frac{36(t_1 + t_2 - \mu)}{33(t_1 + t_2 - \mu) - 5(t_1 - t_2)},$$

where the last inequality follows from the requirement that $C^1 < \bar{C} = (4t_1 + 2t_2 - 3\mu)/(2\theta)$ in order to avoid welfare-reducing monopolization. \square

Proposition 3 defines a necessary condition as it assumes zero additional costs of the increase from C^0 to C^1 . In particular, the requirement is even substantial if $t_1 = t_2$ which warrants $C^1/C^0 > 36/33 = 1.091$. Thus, in order to improve aggregate welfare, the CMO has to incentivize rightholders such that the content size will increase at least by 9.1 %. As rightholders have been active before the CDSM Directive, we may not expect that their share of the CMO revenue will become the main source of income, so this is a substantial requirement.

This leaves us with the question of why the CDSM Directive has given CMOs as representatives of rightholders so much market power. First, it is clear that many platforms are not located within Europe and thus their profit is not relevant for European welfare. Second, European users who may be negatively affected are only a certain fraction of all users. At the same time, however, small local platforms may be marginalized or may even have to leave the market. Thus, it is not clear whether the CDSM Directive will increase even European welfare without *ex post* intervention by competition policies.

5 Concluding remarks

While former EU Commission President Juncker claimed: “With today’s agreement, we are making copyright rules fit for the digital age (...)”,²⁴ this paper has shown that the European Directive on Copyright in the Digital Single Market may lead to more industry concentration in digital platform markets. This may even imply an aggregate welfare loss if the increase in content as a response to the Directive is not substantial. Our analysis confirms concerns that smaller platforms may be marginalized.

It is thus not true that this directive will imply only a “fair” redistribution from platforms to content producers. In particular, if the content is sufficiently valuable for users and if the network effects are strong, a welfare loss is more likely. Our analysis also shows that the case for European competition policies has become more complex, and the Commission will need to monitor the behavior of CMOs carefully.

One CMO has already attempted to break new ground on this frontier. Germany-based Corint Media (the former VG Media) has suggested an agreement with Google that would imply an annual license fee of € 420 million for using press content.²⁵ These cases have yet to fully develop, but they raise questions that are at the

²⁴ European Commission Press Release, ‘Copyright reform clears final hurdle: Commission welcomes approval of modernised rules fit for digital age’ (Luxembourg, 15 April 2019).

²⁵ See ‘Corint Media offers Google a licence agreement,’ Corint Media press release, October 20, 2021. Furthermore, France has already transposed the CDSM Directive into national law, and French competition authorities have fined Google € 500 million for failing to negotiate a deal with French publishers; see *New York Times*, ‘France fines Google \$593 million for not negotiating ‘in good faith’ with news publishers.’, July 13, 2021.

core of this discussion: If Google agreed to these terms, would this constitute a new precedent for “objective and non-discriminatory criteria” that are observable by content platforms of all sizes?

Some have argued that content platforms of greater means will be able to “quietly consolidate their position through a *de facto* alliance with rightholders rather than fearing entrepreneurs”.²⁶ If other and smaller content platforms find these or similar terms unacceptable, would a refusal to license under different conditions by Corint Media constitute an abuse of its dominant position? Would smaller content platforms have failed the “best effort” criterion by finding the terms proposed by Corint Media objectionable?

Our analysis has shown that MFC provisions can have strong anti-competitive effects by marginalizing small platforms. The Commission is charged with reviewing the impact of Article 17 on content platforms with a turnover below € 10 million by five years after the CDSM Directive’s entry into force. This review seems to be of utmost importance given our findings.

With this stipulation, it is clear that the Commission must take the lead in the next formative developments of the CDSM Directive in this context, as our economic analysis has shown very clearly that more guidance is needed, so as to avoid further industry concentration in media markets. At a minimum, the new directive is likely to require an active competition policy.

Appendix

A.1 User prices, monopolization, and multi-homing

We assume now that the platforms can also charge user prices in addition to selling ads. In this case, a user at location x who uses platform 1 enjoys a net payoff of

$$u_1(x) = v + \theta C_1 - a_1 - p_1 - t_1 x + \mu y - \frac{\mu y^2}{2},$$

and for using platform 2 enjoys a net payoff of

$$u_2(x) = v + \theta C_2 - a_2 - p_2 - t_2(1 - x) + \mu(1 - y) - \frac{\mu(1 - y)^2}{2}.$$

Since

$$y = \frac{2\theta(C_1 - C_2) - 2(p_1 - p_2) - 2(a_1 - a_2) + 2t_2 - \mu}{2(t_1 + t_2 - \mu)},$$

this model can explain when platforms will offer their services for free, but sell ads to firms or compete by user prices only. Let $\beta > 0$ denote the sales price of an ad per

²⁶ See Nicolas Colin, ‘The EU Copyright Directive Won’t Kill The Internet But It Will Kill Startups’, Forbes, September 17, 2018.

user and unit of a_i . In the main body of the paper, $\beta = 1$. Since $\partial y/\partial p_i = \partial y/\partial a_i$, the size of β determines which business model each platform chooses.

For example, the profit of platform 1 is now given by $\pi_1 = yp_1 + y\beta a_1$, and if $\beta > (<)$ 1, platform 1 is better off by running a two-sided (one-sided) platform that sells ads (charges a user price) because $\partial\pi_1/\partial p_1 < (>)\partial\pi_1/\partial a_1$ for all $p_1 = a_1$. In general,

$$\beta > (<)1 \implies p_i = (>)<0, a_i > (=)0.$$

Our model is thus strategically equivalent to a model in which one-sided platforms charge user prices.

These models and our model in the main body of the paper in which v is sufficiently large assume that both platforms are active irrespective of the CMO policy. If $C > \bar{C}$, platform 2 will leave the market in case of an exclusive deal of the CMO with platform 1 because it cannot even attract users if it does not sell ads (or charges a zero price in case of a one-sided platform).

In this case, the optimal ad level is no longer given by (5) for platform 1. Platform 1 will set a_1 such that platform 2 is kept out of the market: $y = 1$ holds for $a_2 = 0$, which implies

$$a_1^{**} = \pi_1^{**} = \theta C + \mu/2 - t_1 > a_1^* + a_2^* = t_1 + t_2 - \mu$$

because $C > \bar{C}$. We know from Proposition 2 that welfare decreases with an exclusive deal between the CMO and platform 1 if $4t_1 - t_2 - 3\mu/2 > 0$. Welfare will not change if C increases beyond \bar{C} : All users will be served by platform 1, and the increase in ads that is due to an increase in C is a redistribution from users to platform 1. Consequently, it should be clear that monopolization can never be welfare-improving if t_2 is not too large.

The case of monopolization can be extended to allow for multi-homing: Suppose that some users are willing to accept ads (or to pay) also from (for) the small platform 2 in addition to platform 1. In this case, the two platforms are not substitutes, but the small platform 2 complements platform 1 for some users. For this case, the network externality is already maximized by platform 1, so that a user of only platform 1 at location x realizes

$$u_1(x) = v + \theta C_1 - a_1 - t_1 x + \frac{\mu}{2}.$$

Platform 2's additional services have a value of $\gamma v, 0 < \gamma < 1$, as a similar service is already offered to all users by platform 1 (which will materialize only if $v > 0$: if both platforms offer some stand-alone value to consumers). Thus, a user who subscribes to both platforms and is located at x realizes a payoff

$$u_{12}(x) = (1 + \gamma)v + \theta C_1 - a_1 - a_2 - t_1 x - t_2(1 - x) + \frac{\mu}{2}.$$

Now the indifferent user is the one that is indifferent between using both platforms or only platform 1, and this indifference position is given by \tilde{y} such that

$$\gamma v - t_2(1 - \tilde{y}) - a_2 = 0 \Leftrightarrow 1 - \tilde{y} = \frac{\gamma v - a_2}{t_2},$$

if $v > 0$. As is well-known from the literature (Anderson et al. 2017; Foros et al. 2019), multi-homing implies that the small platform’s demand depends only on its strategic variable a_2 but not on a_1 . The reason is that a user who considers using the complementary small platform 2 in addition to the large platform 1 will consider only the additional ad level a_2 that she has to bear. Thus, platform 2 maximizes $(1 - \tilde{y})a_2$ w.r.t. a_2 which implies $a_2^{***} = \gamma v/2$.

Multi-homing implies that the dominant platform 1 can even increase ad levels if $v > 0$: It has to set a_1 such that platform 2 only complements platform 1, and does not substitute for it. Setting a_1 such that platform 2 does not replace platform 1 – that $y = 1$ holds for $a_2^{***} = \gamma v/2$ – implies

$$a_1^{***} = \pi_1^{***} = \theta C + \frac{\mu}{2} - t_1 + \frac{\gamma v}{2} > a_1^{**} = \pi_1^{**}.$$

Consequently, multi-homing makes the incentive to monopolize the market through an exclusive deal with the CMO stronger.

A.2 Flexible pricing in the advertising markets

Suppose that each two-sided platform faces flexible ad prices such that the revenue per user depends on the level of advertising. Similar to Anderson and Coate (2005) and Peitz and Valletti (2008), we assume a downward-sloping demand curve for advertising per user. In particular, the advertisers’ willingness-to-pay per user is given by $\omega_i(a_i) = Aa_i^\epsilon$ where $0 \leq \epsilon < 1$. In the main body of the paper, we assume $A = 1$ and $\epsilon = 0$. Each platform maximizes $y_i(a_i, \cdot)\omega_i(a_i)a_i$, which implies the first-order conditions

$$\begin{aligned} y_i(a_i^*, \cdot) [\omega'_i(a_i^*)a_i^* + \omega_i(a_i^*)] + \frac{\partial y_i(a_i^*, \cdot)}{\partial a_i} \omega_i(a_i^*)a_i^* &= 0 \\ \Leftrightarrow \frac{\partial y_i(a_i^*, \cdot)}{\partial a_i} a_i^* + (1 - \epsilon)y_i &= 0, \end{aligned}$$

where $y_i(a_i, \cdot)$ denotes the market share of platform i . The first-order conditions imply equilibrium ad levels

$$a_i^* = \frac{(1 - \epsilon)[2\theta(C_i - C_j) + 2(1 - \epsilon)t_i + 2(2 - \epsilon)t_j - \mu(3 - 2\epsilon)]}{2(3 - 2\epsilon)}$$

and an equilibrium market share

$$y_i^*(C_i, C_j) = \frac{1}{2} + \frac{2\theta(C_i - C_j) - (t_i - t_j)}{2(3 - 2\epsilon)(t_i + t_j - \mu)}$$

of firm i . Both expressions converge to (5) and (6) for $\epsilon = 0$, respectively. $y_1^*(C_1, C_j)$ increases with ϵ (unless $C_1 < C_2$), which shows that flexible pricing on ad markets makes the large platform relatively stronger compared to the small platform.

More importantly, a_i^* decreases with ϵ :

$$\frac{\partial a_i^*}{\partial \epsilon} = -\frac{(1 - \epsilon)2(t_1 + t_2 - \mu)}{2(3 - 2\epsilon)} - \frac{2\theta(C_i - C_j) + 2(1 - \epsilon)t_i + 2(2 - \epsilon)t_j - (\mu(3 - 2\epsilon))}{2(3 - 2\epsilon)^2} < 0.$$

Platforms now also face a substantial decline in ad prices if their ad level is too large. When demand becomes very flexible such that $\epsilon \rightarrow 1$, then $a_i^* \rightarrow 0$. In this case, platforms would realize only a small or zero revenue as they can attract users away from the rival only with small ad levels, and thus also the CMO will receive only some share of this very small revenue. Eq. (7) generalizes to

$$C \leq \bar{C} = \frac{2t_1(2 - \epsilon) + 2t_2(1 - \epsilon) - (\mu(3 - 2\epsilon))}{2\theta} \geq 0.$$

Note carefully that $\partial \bar{C} / \partial \epsilon = -(t_1 + t_2 - \mu) / \mu < 0$: A larger ϵ makes monopolization more likely. We now define

$$B_1 = \frac{2t_1(1 - \epsilon) + 2t_2(2 - \epsilon) - (\mu(3 - 2\epsilon))}{2\theta} = \bar{C},$$

$$B_2 = \frac{2t_1(2 - \epsilon) + 2t_2(1 - \epsilon) - (\mu(3 - 2\epsilon))}{2\theta},$$

where $B_1 \geq B_2$ because $t_1(1 - \epsilon) + 2t_2(2 - \epsilon) \geq 2t_1(2 - \epsilon) + 2t_2(1 - \epsilon)$, which also allows us to write equilibrium profits as

$$\pi_i^*(C_i, C_j) = \frac{A(1 - \epsilon)^{1-\epsilon}(2\theta)^{2-\epsilon}}{(2(3 - 2\epsilon))^{2-\epsilon}(t_i + t_j - \mu)} [B_i + (C_i - C_j)]^{2-\epsilon}.$$

The first term is a constant and does not depend on C_1 and C_2 . As was detailed in Proposition 1, an exclusive deal with platform 1 yields a larger profits than a deal with both platforms only if $\pi_1^*(C, 0) - \pi_1^*(0, 0) - [\pi_1^*(C, C) - \pi_1^*(0, C)] - [\pi_2^*(C, C) - \pi_2^*(C, 0)] > 0$, which is equivalent to

$$\Delta = (B_1 + C)^{2-\epsilon} - B_1^{2-\epsilon} - [B_1^{2-\epsilon} - (B_1 - C)^{2-\epsilon}] - [B_2^{2-\epsilon} - (B_2 - C)^{2-\epsilon}] > 0.$$

If $\epsilon = 0$, $\Delta > 0$ requires $C(3C - 2B_2) > 0$ which implies $C > 3B_2/3 = (2t_2 + 4t_2)/(3\theta)$ and confirms Proposition 1. For large elasticities, firms set low ad levels and cannot cash in much on content, and thus exclusion becomes less profitable.

In particular, suppose that both platforms are symmetric such that $B = B_1 = B_2$ and $B = C = \bar{C}$ holds: C is so large that a marginally larger C implies monopolization. In this case $\Delta = 2^{-\epsilon}(4 - 3 \times 2^\epsilon)B^{2-\epsilon}$, which is positive if $4 - 3 \times 2^\epsilon > 0$ or $\epsilon > 0.415037$.

Thus, $\epsilon > 0.415037$ is a sufficient condition for a range of C to exist for an exclusive deal with platform 1. If $\epsilon < 0.415037$, the market is monopolized by platform 1 to begin with or ad revenues are so small that exclusion does not pay off. The last case is uninteresting for our analysis.

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