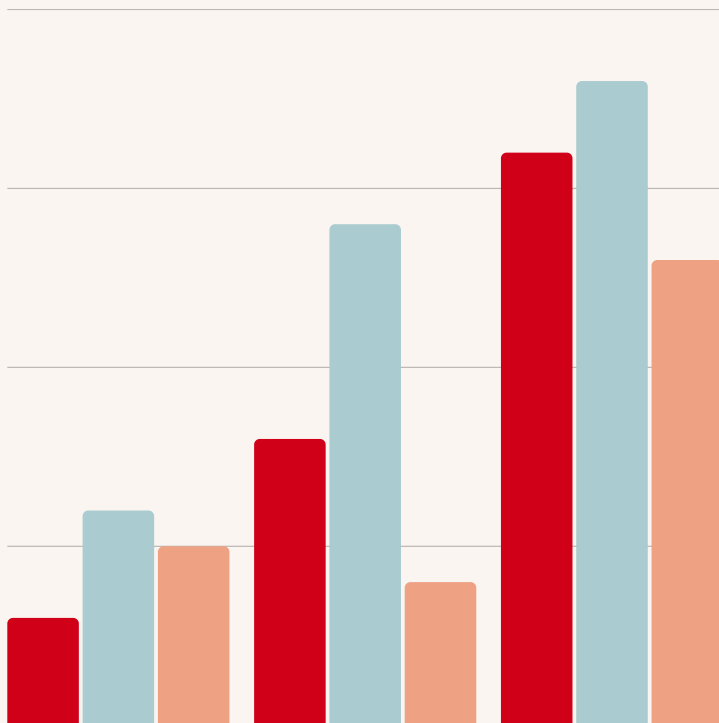KONKURRANSE·
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# AD INTERMEDIARIES AND JOINT OWNERSHIP IN MEDIA MARKETS

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# Ad intermediaries and joint ownership in media markets

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**Abstract**

We study how common ownership of advertising intermediaries affects competition in media markets. Using a two-sided market model, we add an advertising intermediary that can be (or not) commonly owned by two media platforms. An independent intermediary can soften platform competition when network effects outweigh platform differentiation, shifting costs to consumers through higher prices. Joint ownership further relaxes competition on the advertising side because platforms internalize intermediary profits, increasing advertiser prices. Even loss-making intermediaries may operate under joint ownership. We discuss managerial and competition policy implications.

# 1 Introduction

Common ownership and cross-ownership have received particular attention in the recent past (e.g., Azar, Schmalz and Tecu, 2018; He and Huang, 2017; Elhauge, 2020; Bai and Matsumura, 2023; Stenbacka and Van Moer, 2023; Pi and Zhang, 2024). The key revelation of this literature is that common ownership softens the extent of competition (e.g., through pricing or less innovation)—leading to higher prices and profits at the expense of the consumers (see e.g., Farrell and Shapiro 1990; Gilo, Moshe and Spiegel, 2006; Brito, Ribeiro and Vasconcelos, 2019; López and Vives, 2019).[1][2]

Media markets have so far not been at the center of this discussion. We fill this gap by analyzing another recent trend in the industry—the emergence of advertising intermediaries (see D'Annunzio and Russo, 2024). Whereas media companies may sell advertising directly to advertisers, advertising intermediaries may decrease transaction costs and potentially improve efficiencies. However, there is an obvious counter-argument to these potential efficiency gains: their effect on competition between media platforms.

Intermediaries are often formed as joint ventures between competitors. There are a number of such examples of common ownership in ad intermediaries in media markets. The Guardian, Financial Times, CNN International and Reuters formed in 2015 a joint programmatic advertising alliance, Pangea.[3] In Germany, Bertelsmann, Mediengruppe RTL Deutschland, the Spiegel Group and Axel Springer, jointly formed Ad Alliance in 2017,[4] and in Norway, the media conglomerates Aller Media and Amedia formed Diar in 2019, a joint venture selling ad space on behalf of almost 150 newspapers.[5] Against this background, our analysis focuses on analyzing the effect of these intermediaries for the competitive situation in a two-sided market.

Media platforms offer a media product (be it newspapers, television, or radio) to con-

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[1]See also Elhauge, Majumdar and Schmalz (2021) for an overview and literature review of the effects of horizontal common ownership.

[2]As an immediate consequence of these analyses, several European competition authorities have implemented the modified Herfindahl-Hirschman Index (MHHI), as proposed by Azar, Schmalz and Tecu's (2018), taking into account the effect of common ownership (O'Brien and Waehrer, 2017; Rock and Rubinfeld, 2020).

[3]Source: https://www.theguardian.com/gnm-press-office/2015/mar/18/worlds-leading-digital-publishers-launch-new-programmatic-advertising-alliance-pangaea (accessed: September 3, 2025).

[4]Source: https://www.bertelsmann.com/company/alliances/advertising/ (accessed: September 3, 2025).

[5]Source (in Norwegian): https://kommunikasjon.ntb.no/pressemelding/17866750/aller-media-og-amedia-lanserer-diar?publisherId=11014241 (accessed: September 3, 2025).

sumers and consumers' eyeballs to advertisers. The two-sided nature of the market is important, as the advertising side subsidizes the subscription price for readers, viewers, or listeners, taking advantage of network benefits across the two sides of the market. This makes platform markets distinctively different from traditional ("one-sided") markets. And consequently, the effects of intermediaries and ownership may become quite different.

We use Armstrong's (2006) model on two-sided markets as a workhorse model and introduce an advertising intermediary into the model. First, we study the strategic effect of the intermediary. Disregarding any productive function of the intermediary, we find that the mere presence of an advertising intermediary itself may relax competition if network effects (i.e., advertisers' benefit of readers) are sufficiently large, and greater than advertisers' perception of platform differentiation. Second, we let the platforms jointly own the intermediary. We find that ownership further relaxes the competition among platforms, since the platforms regain half of the intermediary's profits, although the strategic intermediary effect is somewhat smaller. Interestingly, we find that even if the advertising intermediary itself is unprofitable, the platforms might find it optimal to establish the intermediary, as the intermediary serves as a commitment device for collusion among the platforms.

## 2 The model

We follow the seminal model of Armstrong (2006) on two-sided markets to derive the advertisers' and readers' demand functions. Two platforms, $\{i, j\} = \{A, B\}$, are located on both ends of a line of length one, and serve two distinct customer groups, $\{k, l\} = \{1, 2\}$, more precisely, advertisers ($k = 1$) and readers ($k = 2$). Figure 1 illustrates the model set-up.

**Advertisers and readers.** Both advertisers and readers are uniformly distributed on a Hotelling line each. Advertisers face transportation costs of $t_1$ for each unit of distance to either platform, whereas readers face transportation costs $t_2$. The advertisers buy ad space for price $p_1^i$ and readers buy access to only one platform for the price $p_2^i$.

The utility for advertisers ($k = 1$) and readers ($k = 2$) of being served by the platform
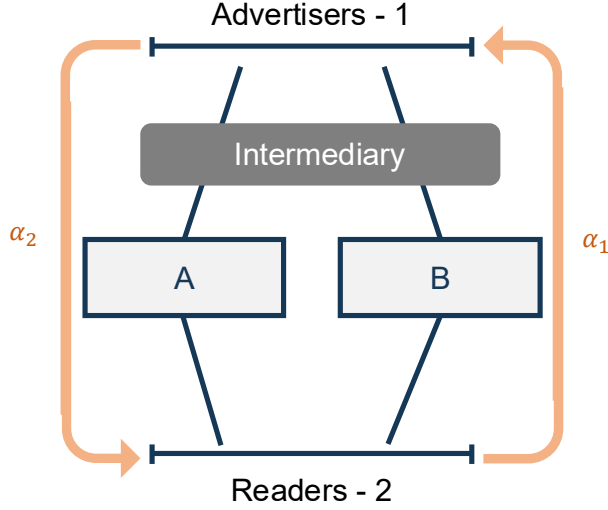
Figure 1: The model set-up.

$A$ and $B$, respectively, is given by:

$$u_k^A = v_k + \alpha_k n_l^A - t_k n_k^A - p_k^A \quad \text{and} \quad u_k^B = v_k + \alpha_k n_l^B - t_k n_k^B - p_k^B, \tag{1}$$

where $v_k$ is gross utility, $\{p_k^A, p_k^B\}$ are the respective prices charged by each of the two platforms, $\{i, j\} = \{A, B\}$, to advertisers and readers, $\{k, l\} = \{1, 2\}$, and $\alpha_k$ is the network benefit that a side-$k$ agent exerts on a side-$l$ agent (e.g., the benefit an advertiser/reader enjoys from interacting with a reader/advertiser on the other side). From this, we can generally (and safely) assume that $\alpha_1 > 0$ (i.e., advertisers always value readers), whereas the sign of $\alpha_2$ (i.e., whether readers like or dislike advertisers) is an empirical question in each specific case.

The two customer groups observe the prices offered by the platforms and form expectations about the size of each customer group on each platform based on these prices. Assuming $v_k$ to be high enough to ensure that the markets on each of the sides are covered, we can derive the indifferent customers on both sides of the market. The demand for the platform $i$ of customers of type $k$ is as follows:

$$n_k^i = \frac{1}{2} + \frac{1}{2} \frac{\alpha_k(p_l^j - p_l^i) + t_l(p_k^j - p_k^i)}{t_1 t_2 - \alpha_1 \alpha_2}. \tag{2}$$

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**Advertising intermediary.** All advertisers buy advertising space on the platforms through an advertising intermediary (I). For that service, the intermediary charges a fee $r$ for advertising sales on both platforms. The intermediary channels the advertisers to the platforms based on their preferences—the advertisers single-home. The advertising intermediary's profit is given by:

$$\pi^I = r(p_1^A n_1^A + p_1^B n_1^B), \tag{3}$$

where $p_1^i$ is the price that advertisers pay on platform $i$ and $n_1^i$ is the number of advertisers selecting platform $i$, i.e., the demand or the market share.

**Platforms.** Platform $i$ sells advertising space on its platform to advertisers, through the advertising intermediary, at price $p_1^i$. Part $r$ of these prices are paid to the advertising intermediary. Moreover, the platform sells news to readers at price $p_2^i$.

In the following, we differentiate two cases. First, the intermediary is independent of the platforms, and, second, the intermediary is jointly owned by the two platforms. For simplicity, we further assume the operating costs to be zero.

# 3   Case 1: Independent intermediary

With no platform ownership in the intermediary, the platforms' profits are given by:

$$\pi^i = (1-r)p_1^i n_1^i + p_2^i n_2^i. \tag{4}$$

Platform $i$ maximizes profit with respect to the price for each side of the platform. Solving for the symmetric equilibrium where each platform offers the same price pair $(p_1, p_2)$ to consumers, the first-order conditions for equilibrium prices yield:

$$p_1(p_2) = t_1 - \frac{\alpha_2}{t_2}\left(p_2 + \alpha_1 + \frac{r}{1-r}p_2\right) \tag{5}$$

and

$$p_2(p_1) = t_2 - \frac{\alpha_1}{t_1}((1-r)p_1 + \alpha_2). \tag{6}$$

Solving the equations in (5) and (6), simultaneously, yields the equilibrium prices and equilibrium profit.

The equilibrium profit equals:

$$\pi^i = \underbrace{\frac{t_1 + t_2}{2}}_{\text{Hotelling}} - \underbrace{\frac{\alpha_1 + \alpha_2}{2}}_{\text{two-sided}} - \underbrace{\frac{r}{2}(t_1 - \alpha_1)}_{\text{direct vs strategic}}. \tag{7}$$

That allows us to analyze the effect of $r$ on the equilibrium profit and to formulate:

**Proposition 1** *The platforms' equilibrium profits decrease in $r$ if $\alpha_1 < t_1$ and increase in $r$ if $\alpha_1 > t_1$.*

There are two effects on the equilibrium profit. First, paying a fee to the intermediary decreases the platforms' profits, i.e., if $r$ increases, the platforms get less of the revenue generated on side 1 ($(1 - r)(p_1^i n_1^i)$ decreases).

Second, there is a strategic effect through the price. This becomes visible in the equilibrium prices:

$$p_1^* = t_1 - \frac{1}{1 - r}\alpha_2 \tag{8}$$

$$p_2^* = t_2 - \alpha_1(1 - r). \tag{9}$$

The direct effect of the intermediary becomes visible in Eq. (8). The intermediary increases the revenues from side 1 by $\frac{r}{2}t_1$. The strategic effect becomes visible in Eq. (9). The intermediary changes the revenues from side 2 by $\frac{r}{2}\alpha_1$. Consequently, the effect on the profits depends on the size of the two effects.

If $\alpha_1 > t_1$, the strategic effect dominates the direct effect. In that case, by both platforms giving away revenues from side 1, the platforms can increase their profits. The symmetric intermediary works as a commitment device to compete less for readers. Consequently, the platforms profit from the intermediary even though it has no productive function.

Note that this positive effect has a limit as this setting requires an intermediary that is willing to operate, i.e., the intermediary has to break even. This is the case if $r \leq 1 - \frac{\alpha_2}{t_1}$.[6]

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[6]To see this: $\pi^{I*} = r(t_1 - \frac{1}{1-r}\alpha_2) \geq 0$.

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# 4 Case 2: Joint ownership of the intermediary

The previous section shows that platforms may profit from introducing a joint intermediary on the advertiser side even if the platforms do not profit from the payment to the intermediary directly at all. In this section, we extend this analysis and turn now to the case of the platforms jointly owning the intermediary. This adds the element of cross-ownership to the analysis. The platforms own a share of the competitor's cash flow generated on the advertiser side.

When the platforms jointly own the intermediary, the platforms' profits follow as:

$$\pi^i = (1-r)(p_1^i n_1^i) + p_2^i n_2^i + \tfrac{1}{2}r(p_1^A n_1^A + p_1^B n_1^B). \tag{10}$$

After maximizing the profits and solving for the symmetric equilibrium, we can summarize the equilibrium profits as:

$$\pi^{i,owner} = \pi^{i,indep} + \underbrace{\frac{r}{2(1-r)}\left(t_1 - \alpha_2 - \tfrac{1}{2}rt_1\right)}_{\text{profit share from intermediary}} + \underbrace{\frac{r}{4}\left(t_1 - \alpha_1\right)}_{\text{add. strategic intermediary effect}} \tag{11}$$

$$= \underbrace{\frac{t_1 + t_2}{2}}_{\text{Hotelling}} - \underbrace{\frac{\alpha_1 + \alpha_2}{2}}_{\text{two-sided}} - \underbrace{\frac{r}{4}(t_1 - \alpha_1)}_{\text{direct vs strategic effect}} + \underbrace{\frac{r}{2}\left(t_1 - \frac{\alpha_2}{1-r} + \frac{r}{2(1-r)}t_1\right)}_{\text{common ownership effect}}. \tag{12}$$

This result allows us to formulate:

**Proposition 2** .

(a) *Joint ownership decreases the strategic intermediary effect in absolute terms.*

(b) *If the intermediary is profitable, the platforms profit even more from the intermediary.*

(c) *If the intermediary is unprofitable, joint ownership may nonetheless be profitable.*

Comparing Eq. (11) and Eq. (7) shows at least three observations. First, the direct and strategic intermediary effects from the previous section become less pronounced. This is straightforward as the platforms get half of their payment from the intermediary back. Second, the platforms benefit from the profit of the intermediary. Not paying to an external intermediary increases the profit. Third and more importantly, common ownership of the intermediary changes the equilibrium prices. Through the ownership of the intermediary,

the platforms value the profits of their competitor - calming the level of competition between the platforms on side 1.

This can be best seen through the equilibrium prices:

$$p_1^* = t_1 - \frac{1}{1-r}\alpha_2 + \frac{r}{2(1-r)}t_1 \tag{13}$$

$$p_2^* = t_2 - \alpha_1(1-r) - \tfrac{1}{2}r\alpha_1 \tag{14}$$

Comparing Equation (13) with (8) shows that joint ownership increases the price $p_1^*$. The larger $r$, the stronger is the effect on the competition between the platforms, and the higher is $p_1^*$.

This common ownership effect on the prices implies that the platforms can profitably operate an intermediary that would be unprofitable if it operated independently. This becomes obvious when comparing the profits of the intermediary between or two cases. The intermediary's profit when owned by the platforms exceeds the profit of an independent intermediary by $\frac{r}{2(1-r)}t_1$.

# 5 Discussion: Policy implications

In the last years, we have observed a growing number of advertising intermediaries, often in the form of joint ventures between competing media companies. As a result, competition authorities around the world started to evaluate these agreements in the light of competition law.

We show that common ownership of advertising intermediaries can have adverse effects on competition. When there is an independent intermediary, we observe two effects. On the one hand, the intermediary decreases the platforms' profits (direct effect), since the intermediary takes a share of the income of platforms that come from advertisers. This promotes platforms to increase prices for consumers, reducing competition on this side of the market (strategic effect). In other words, consumers bear the costs of the intermediary. This effect is positive for the platforms' profits. If the reader side of the market is very important for platforms, the strategic effect tends to dominate the direct effect, which means that platforms can gain with an independent intermediary.

When there is an advertising intermediary which is owned by the platforms, the profits

of the intermediary are shared between the platforms (common ownership effect). This reduces the competition for advertisers as the platforms start valuing their competitor's profit. As a result, advertisers must bear higher prices, and the platforms reap higher profits. Common ownership of an advertising intermediary works as a commitment device to raise prices, leading platforms to align their interests to soften competition in the advertising side of the market (anti-competitive effect). In other words, with common ownership of an advertising intermediary, advertisers bear these additional costs of the intermediary.

We made a number of simplifying assumptions in our analysis. In our set-up, the advertising intermediary has no productive effect (for example, there are no synergies of pooling resources to serve the advertising market). In the real world, intermediaries have also a productive function, for example, by sharing consumer data, they can help advertisers to better target their customers. These effects then have to be weighed against the costs of lower competition.

Another benefit of jointly owned advertising intermediaries is that they can help media firms to face competition in the advertising market with the tech giants (e.g., Facebook and Google) that nowadays have a major share of the advertising market. This also must be considered when considering the anti-competitive effects of common ownership.

Finally, our model does not take into consideration multi-homing on the consumer side (see, for instance, Anderson et al. 2017; 2018; 2019). Multi-homing is known to reduce competition for consumers. Accordingly, if there are two media firms in the market, and all or many consumers buy from both media firms, this reduces competition for the consumers that multi-home, allowing firms to increase price for these consumers. The presence of multi-homing can then worsen the potential negative effects of cross-ownership, because with multi-homing and common ownership, media firms will be able to exploit both the advertiser and the consumer side of the market.

The introduction of a productive intermediary and of multi-homing will then make the welfare effects of common ownership of advertising intermediaries much more complex. On the one hand, there are positive externalities by sharing resources and data. On the other hand, media firms hold great market power on both the advertising side and the consumer side of the market. In turn, the introduction of platforms with a dominant position in the market (like Google and Facebook) will reduce the anti-competitive effects of common ownership of advertising intermediaries. Regulators then have to consider

all these (pro- and anti-) competitive effects when evaluating the common ownership of advertising intermediary by rival platforms.

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