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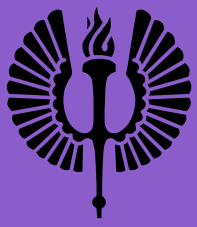

TURUN YLIOPISTO

MEASURING CROSS-OWNERSHIP AND ITS EFFECTS IN NEWSPAPER PUBLISHING INDUSTRY

Tom Björkroth & Mikko Grönlund

TURUN YLIOPISTON BRAHEA-KESKUKSEN JULKAISUJA 2021, 2

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ABSTRACT

Cross-ownership has gained more attention since the Millennium. The effects of cross-ownership have been incorporated into standard game theoretical models, altering the traditional concentration measures and hence also the relationship between concentration and profitability. Empirical research on the effects of cross-ownership on concentration and profitability is limited. This article compares the traditional concentration index with the one modified for cross-ownership in the Finnish newspaper publishing industry. With a dataset that covers all daily newspaper publishers between years 1950 and 2016, we show that cross-ownership is reflected in the modified empirical concentration measures. We also show how acknowledging the two-sidedness of a market affects the profitability measures originally developed for traditional markets.

KEYWORDS: Newspapers, cross-ownership, market concentration, profitability, two-sided markets

ABSTRAKTI

Kiinnostus ristiinomistusta ja sen vaikutuksia kohtaan on lisääntynyt vuosituhannen vaihteen jälkeen. Sisällytettäessä ristiinomistuksen vaikutukset yleisesti käytettyihin peliteoreettisiin malleihin, muuttavat ne sekä perinteisiä keskittymismittareita että keskittymisen ja kannattavuuden suhdetta. Ristiinomistuksen vaikutuksista keskittymiseen ja kannattavuuteen tehdyn empiirisen tutkimuksen määrä on kuitenkin rajallinen. Tässä artikkelissa tarkastellaan suomalaisen sanomalehtikentän keskittymistä sekä perinteisellä että ristiinomistuksen huomioivalla muokatulla keskittymisindeksillä. Aineistolla, joka koostuu kattavasti suomalaisista sanomalehdistä vuosien 1950 ja 2016 väliseltä ajanjaksolta, osoitamme muutamilla esimerkeillä, kuinka yritysten välinen ristiinomistus heijastuu muokattuihin keskittymismittareihin. Osoitamme myös, kuinka markkinoiden kaksipuolisuuden huomioiminen vaikuttaa alun perin perinteisille yksipuolisille markkinoille kehitettyihin kannattavuusmittareihin.

AVAINSANAT: Sanomalehdet, ristiinomistus, markkinoiden keskittyminen, kannattavuus, kaksipuoliset markkinat

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1 Introduction

Digitalization of content challenges traditional media products such as newspapers and contributes to market exit and consolidation in several countries, including Finland. Competition policy in media markets is not only concerned with this trend because of reduced economic competition, but also because of potentially reduced pluralism (Stühmeier, 2016). Media market structures change continuously and the observation of increasing market concentration in newspaper publishing is not a new one. For example, Picard (1988) examined the concentration in the U.S. newspaper industry using daily papers in local markets and Dertouzos and Trautman (1990) studied economic effects of media concentration in the U.S. newspaper industry, while Artero & Sánchez-Tabernero (2015) provide more recent results on increasing newspaper market concentration in Spain.

The study of market concentration and its effects on market competition dates to Mason (1939) and Bain (1951), who identified the positive relationship between market concentration and profitability. Subsequently a vast number of studies have been conducted on the topic, (for a survey c.f. Gilbert, 1984). The early studies did not consider the issue of cross-ownership. Some later studies (e.g. Ferguson, 1983) have focused on its effects, but with cross-ownership referring to same owners controlling different media. In what follows, cross-ownership refers to horizontal cross-ownership within the same media, i.e. between firms in the newspaper publishing industry.

Depending on its extent and nature, cross-ownership can affect firms' profit maximization; in that, it considers the effects of its own actions on the partly owned rivals' or on its main owners' profitability. Consequently, mutual cross-ownership alters the nature of interdependence between oligopolistic firms more than simple, one-way horizontal cross-holdings. Reynolds and Snapp (1986) pioneered in incorporating the effect of cross-ownership into Cournot models. They make a distinction between a firm's operating and aggregated profit, the latter of which includes firms own profits and the profits from its stakes in the rivals. Bresnahan & Salop (1986)

extended this approach by maintaining the focus on direct interests, but introduced a distinction between financial and corporate control interests. Our paper adheres to this direction of development. We note that Flath (1992) represents an alternative direction, by maintaining the focus of Reynolds and Snapp (1986) on financial interests, but adds the distinction between direct and indirect interests. Maxwell, Salop & Parsons (1999) complements the theory by focusing on effects of common ownership, i.e. external investors holding stakes in a number of rivals. Salop & O'Brien (2000) extended the Cournot model to consider partial ownership interests under different assumptions regarding financial interests and corporate control. These extensions maintain the traditional relation between market power and concentration. This article does not consider these alternative directions, leaving them as potential future avenues of research.

With horizontal cross-ownership, the market concentration is measured by a modified Herfindahl-Hirschman index (MHHI), which adds a factor to the traditional Herfindahl-Hirschman index (HHI) to account for the degree of cross-ownership and the extent of control that such ownership allows the firms to exert on each other.

Because cross-ownership is likely to influence firms' incentives to compete, the MHHI serves as a rough gauge of these partial ownerships' effects on competition.

Empirical studies show mixed results on whether cross-ownership or related concentration measures matter for pricing or output (c.f. Newmark, 2004). However, recent contributions point to that, the issue of increased firm interdependency warrants attention. In studying the effect of common ownership in the airline industry on pricing, Azar, Schmalz and Tecu (2018) find based on a fixed-effect panel regressions that ticket prices are approximately 3-7% higher on the average US airline route than would be the case under separate ownership. They conclude that there are indications of a causal link between common ownership and higher product prices. According to Elhauge (2016), horizontal shareholdings can also help to explain other economic phenomena such as the use of "seemingly perverse" schemes of executive compensation that corporations fail to expand output and employment despite high profits, and the rise in economic inequality. He argues that such harmful economic consequences can and should be mitigated by enforcement of antitrust law to challenge stock acquisitions resulting in anticompetitive horizontal shareholdings.

Apart from the contribution of Azar et al (2018), empirical studies are still quite limited. Campos and Vega (2002) studied to what extent common ownership amplifies the traditional concentrations measures in the Spanish

electricity generating industry. Azar (2012) estimates the effects of common ownership of U.S. stocks over time with cross industry panel regressions. He finds a positive relationship between the degree of cross-ownership and profit margins, concluding that the full ownership structure of the firms, including institutional shareholders with passive portfolio strategies, should be used when calculating the modified indices of market concentration.

In the empirical literature we have reviewed, the effects of horizontal cross-ownership have not been analysed in the newspaper publishing industry. This article will do that by investigating to what extent the cross-ownership affects the traditional concentration indices in the Finnish market for newspaper publishing. The analysis is extended to consider the recent advances in theory of two-sided markets by Correia-da-Silva, Jullien, Lefouili & Pinho (2018), which establishes a connection between market concentration and profitability in the context of platforms. This complements our earlier studies on regional and national market concentration in newspaper publishing.

The structure of the article is as follows. Chapter 2 restates the basic model and recent modifications of how cross-ownership alters a quantity competition framework and how the modified concentration index is derived and related to average industry profitability. Chapter 3 describes the data used in this paper together with an outlook of development of market concentration in Finnish newspaper publishing. It also reports the effects of cross-ownership on concentration levels. Chapter 4 analyses the implications of cross-ownership and increased concentration on the profitability of the industry. We calculate the weighing matrix and analyse to what extent the cross-ownership has caused the HHI and the MHHI to diverge.

Chapter 5 concludes and discusses future avenues of research.

2 Method - Cross-ownership and concentration

2.1 Theory behind measures derived

Our approach builds on the familiar relation between HHI and intensity of competition when firms are Cournot competitors, i.e. compete in homogenous products with quantities or capacity as strategic variables.[1] Let the cross-ownership be reflected in β_{ij} that denotes the degree to which firm i holds a stake in firm j, or the weight that manager of firm j places on owner i's profits.[2] The shareholding may (but does not have to) reflect the degree of control that owner i has over firm j, the γ_{ij}. The degree of ownership and the degree of control can coincide, which means that $\beta_{ij} = \gamma_{ij}$. The manager of firm j maximizes the profit (Π_j) taking into account the cross-ownership, maximizing the weighted profit[3] of its i ($i=1,...N$) owners and a total of k ($k=1,..,M$) firms and solves:

$$\max_{q_j} \Pi_j = \max_{q_j} \gamma_{ij}\pi^i = \max_{q_j} \sum_i \gamma_{ij} \sum_k \beta_{ik}\,\pi_k$$

$$= \max_{q_j} \sum_i \gamma_{ij} \sum_k \beta_{ik}\,[P(Q)q_k - C_k(q_k)]$$

The first order condition is:

[1] The model is based on O'Brien & Salop (2000, 608-614). The assumption of homogeneous goods is a simplification, since newspapers can be thought of as differentiated products.
[2] There is a total of i firms whose interests are considered by the manager.
[3] Profit is defined, as usual, as a difference between revenues $P(Q)q_k$ and costs $C_k(q_k)$.

$$\frac{\partial \Pi_j}{\partial q_j} = \sum_{1=1}^{M} \gamma_{ij} \left\{ \beta_{ij}[p' - c'(q)] + \sum_{k=1}^{N} \beta_{ij} p'(Q)\, q_k \right\} = 0$$

As Campos and Vega (2002) note, when comparing this first order condition to the standard first order condition of a Cournot model, it is obvious that cross-ownership alters the effective market concentration and alters the market equilibrium in terms of output. Consequently, cross-ownership also alters the traditional relationship with the concentration measure HHI and the relative price-cost margin (the Lerner index).

By multiplying the first order condition through with *Q/Q* and with *1/p* and rearranging, the Lerner index can be expressed as:

$$L_j = \frac{p - c_j'(q_j)}{p} = \frac{1}{\eta} \sum_{k=1}^{N} \frac{\sum_{i=1}^{M} \gamma_{ij} \beta_{ik}}{\sum_{i=1}^{M} \gamma_{ij} \beta_{ij}} s_k$$

, where η denotes the absolute value of elasticity of demand. Multiplying this by s_j and summing over all j yields the weighted industry average Lerner index (L)

$$L = s_j L_j = \frac{p - c_j'(q_j)}{p} s_j = \frac{1}{\eta} \sum_{k=1}^{N} \frac{\sum_{i=1}^{M} \gamma_{ij} \beta_{ik}}{\sum_{i=1}^{M} \gamma_{ij} \beta_{ij}} s_k s_j$$

Since the summation term is the modified Herfindahl-Hirschman index (MHHI), we get:

$$L = s_j L_j = \frac{1}{\eta} MHHI$$

To elaborate how cross-ownership modifies the traditional relationship $L = (HHI/\eta)$, we can express the MHHI as:

$$MHHI = HHI + \sum_j \sum_{k \neq j} \left(\frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}} \right) s_k s_j$$

, where we can denote the summation term as ΔMHHI.

With cross-ownership, the summation term exceeds zero, which means MHHI>HHI. Consequently, using the MHHI instead of HHI in calculating the Lerner index means that the weighted industry price cost margin (or degree of market power) is larger in equilibrium with cross-ownership and when the degree of control in and by horizontal rivals increases.

Since the standard HHI is straightforward to calculate, we need to calculate the summation term in order to derive the MHHI. The MHHI has been simplified to a matrix notation:

$$MHHI = s' \Phi s$$

, where *s'* is a transpose of the vector of firms market shares *s*, while Φ denotes the weighting matrix, containing not only the degrees of cross-ownership, but the weight firm *j* places on its rival owners' profits in relation to its own. *s* denotes the vector of market shares. The weighted matrix Φ is of the form:

$$\Phi = \begin{matrix} \phi_{11} & \cdots & \phi_{1N} \\ \vdots & \ddots & \vdots \\ \phi_{N1} & \cdots & \phi_{NN} \end{matrix}, \text{where } \phi_{kj} = \frac{\sum_{i=1}^{M} \gamma_{ij} \beta_{ik}}{\sum_{i=1}^{M} \gamma_{ij} \beta_{ij}}$$

An alternative to the derivation above is to follow the approach by Gramlich & Grundl (2017) and divide the manager's maximization problem by $\sum_i \gamma_{ij} \beta_{ij}$ in order to get the profits notation as:

$$\pi_j + \sum_{k \neq j} \frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}}$$

which is equal to

$$= w_{jj}\pi_j + \sum_{k \neq j} \widetilde{w}_{jk}\pi_k$$

The weight $\widetilde{w}_{jk}$ includes the weight that firm *j* places on the profits of the rival *k*, relative to the weight w_{jj} it places on its own profits. These profit weights are collected in a matrix $\widetilde{W}$ that can be used to calculate the MHHI. The *NxN* weight matrix is multiplied with the column and row vectors of N firms' market shares, i.e.:

$$MHHI = s'\widetilde{W}s$$

The degree of cross-ownership between a pair of firms can be approximated by the number of dividend-earning shares held in and by a rival firm. The degree of control depends on the specific voting rights conferred to those shares. With proportional control right $\gamma_{ij} = \beta_{ij}$, which means that absent any other cross-ownerships a rival *i*'s stake of 20 percent yields it a 20 percent control, and has a weight of about 0.0625 in firm *j*:s profit maximization. This is probably a simplification of the reality, but it serves as a benchmark against which to discuss the effect on results of alternative modes of control.

Minority shareholdings can result in common board members between actual and potential competitors, i.e. horizontal interlocking directorates (Petersen, 2016). Interlocking directorates can influence, just as cross-ownership per se, competition negatively in two ways. First, they can reinforce the reduction from the minority shareholding on incentives to compete (unilateral effects). Secondly, they may facilitate collusion between the firms (coordinated effects) due to the increased transparency (Gabrielsen, Hjelmeng & Sørgard, 2011; Petersen, 2016; OECD, 2008).

We know that the cross-ownership between Finnish newspaper publishers has resulted in interlocking directorates, but with limited affects at the regional level. However, it is beyond the scope of this paper to analyse whether this plays a role for incentives for coordination in terms of geographical market segmentation, for example.

After a brief industry description, we will analyse the development of market concentration and the extent of cross-ownership in the Finnish newspaper publishing industry.

3 Market concentration and cross-ownership in Finnish newspaper publishing industry

3.1 Description of the current newspaper markets

According to Lehtisaari and Grönlund (2015), Finland has been an exceptional market for newspapers because subscriptions have such a solid foothold. In addition, an encompassing and effective home delivery system has enabled newspapers to function as an efficient marketing channel. Therefore, newspapers retained their position as the largest advertising medium until recently. During the recent years, the Finnish newspaper publishing industry has experienced substantial changes both in the business environment and in terms of technological development. Fast spread of ICT, and according to Lehtisaari & al. (2012) the rise of the Internet, the digitalisation of information and the dissipation of boundaries between media platforms, convergence changes the socioeconomic field in which newspaper publishers operate. Ala-Fossi & al. (2020) have stated that in Finland digital distribution platforms have gained popularity while traditional distribution channels have lost ground. This change in consumer media usage has influenced and reallocated advertisers' investments and, consequently, the media business environment. Concurrently, the Internet and the emergence of free-of-charge online news have affected people's willingness to pay for journalistic contents (Grönlund & Björkroth, 2011). According to the Reuters Institute Digital News Report (2019) even though the proportion of people who pay for online news is somewhat higher than average internationally, less than 20% of Finns pay for online news.

Finnish newspaper publishing markets are divided to several regional markets[4] that are characterized by relatively large enterprises publishing one

[4] Finland is divided into 19 regions, called maakunta in Finnish. The regions are governed by regional councils, which serve as forums of cooperation for the municipalities of a region.

or several newspapers with predominantly regional circulation. Only a few newspaper titles, including tabloids, which can be classified as national. A primary indicator of industry change involves the number of entities active in the field, because it reveals whether the industry is expanding or decreasing. The total number of newspapers reached its height in 1990, but the economic depression of the early 1990s led to closures and mergers of many economically non-viable newspapers, primarily non-daily newspapers.

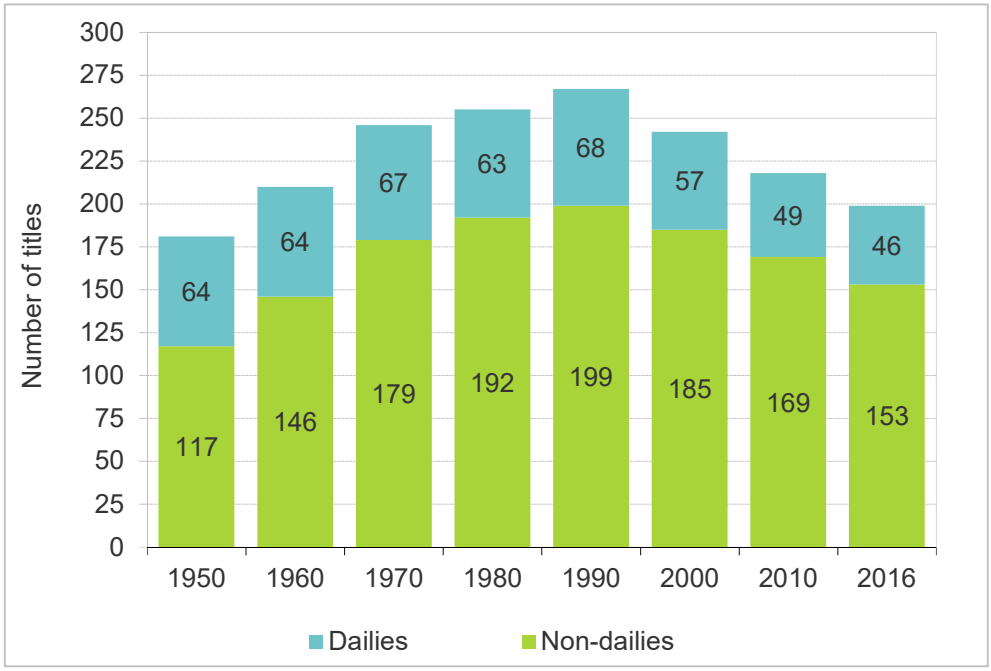

Figure 1. Total number of paid-for newspaper titles 1950-2016 (Source: modified from Björkroth & Grönlund, 2015)

According to Björkroth & Grönlund (2015), between 1950 and 2010, the Finnish newspaper industry faced a total of 240 newspaper entries and 197 exits. After 2010, there has been approximately twenty newspaper exits and by the year 2016, the total number of paid-for newspaper titles had declined

The main tasks of the regions are regional planning and development of enterprise and education. In addition, the public health services are usually organized regionally.

to approximately two hundred[5]. Total print circulation of newspapers has declined for almost three decades and it was estimated[6] to have fallen well below 2.5 million around mid of 2010's. The continued decline is a serious problem for the newspapers because most of their revenue, excluding some exceptions, still comes from print. However, Finnish newspaper publishers have smoothed their print-readers' way into digital by offering bundled subscriptions at a similar price – or slightly higher – as print-only subscriptions. The government's decision[7] to decrease VAT for digital media from 24% to 10% (the same as for subscribed print media) entered into force on 1 July 2019. This tax reduction will probably accelerate the change from print to digital and make investing in online services more attractive for publishers.

In competition for the readers and advertisers, the pressure on newspapers has been shown to stem from intra- (between newspapers) and inter-media (newspapers vs. other media) competition (Grönlund & Björkroth, 2011). To succeed, major Finnish newspaper publishing companies have responded to the challenges posted by the changing business environment by expanding into other media or new business areas. Concurrently, the concentration and chaining of newspaper titles and companies has continued, and significant acquisitions have continued in the 2010s. This has increased market concentration and market position of the major newspaper companies compared to their competitors, especially in the regional markets, has strengthened. In addition, newspaper companies have increased editorial and marketing co-operation, both within and between different newspaper chains. Therefore, the current Finnish media landscape is to an increasing degree both vertically and horizontally clustered and integrated, shaping the landscape of Finnish news media into an even more complex network. For example, towards the end of 2019, *Keskisuomalainen Oyj* owned over a quarter (28%) of all member titles[8] of the Finnish Newspapers Association. The five largest groups measured with number of

[5] A quarter of all paid-for newspaper titles are dailies (4-7 times a week) and the remaining three quarters are non-dailies (1 to 3 times a week).

[6] Total circulation data is based on verified audits by Media Audit Finland. However, a growing number of newspapers have been excluded from circulation auditing. Therefore, it has become increasingly difficult to calculate or estimate total circulation of newspapers.

[7] HE 303/2018 vp
https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Documents/HE_303+2018.pdf

[8] The association's members publish 170 newspapers, 59 free newspapers, two web publications and four other newspapers.

titles[9] accounted for half (51%) of all member titles. The aggregated share of the ten largest newspaper-publishing groups in terms of titles is already two-thirds (67%).

3.2 Concentration of the newspaper markets

If we calculate the HHI-index, scaled from zero to 10,000, for the entire Finland we get for ownership HHI_O=955.9 and for newspaper circulation HHI_N= 321.9, indicating a low degree of concentration. However, the average concentration and the market share mobility of ownership at the regional level has been increasing since the 1950s, while this is less clear for the level of circulation. (Björkroth & Grönlund, 2015)

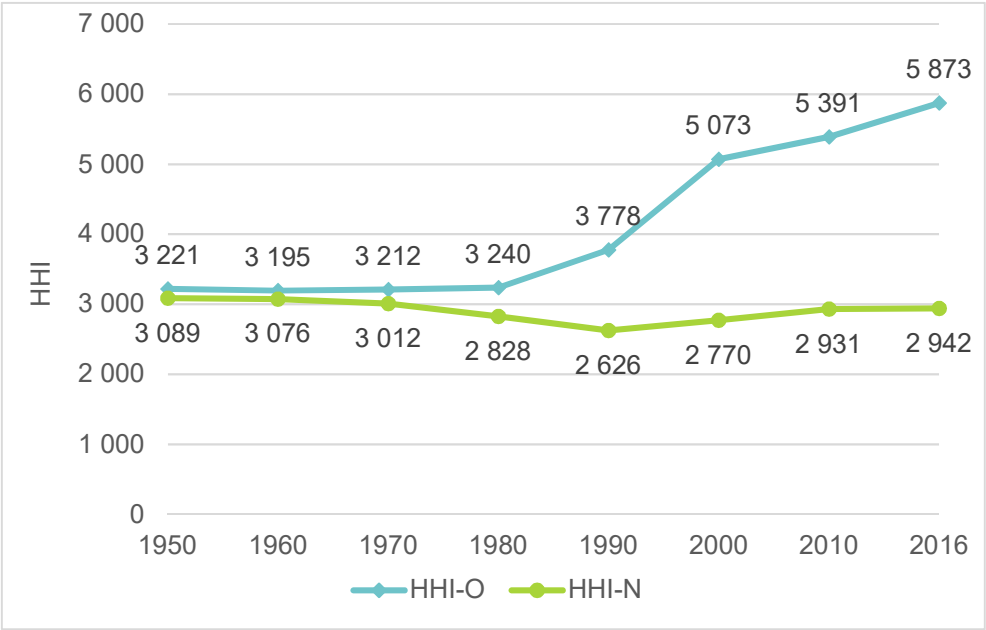

Figure 1. Development of average regional concentration level of ownership and circulation in Finland for 1950-2016

[9] Keskisuomalainen Oyj, Alma Media Oyj, Suomalainen Lehtipaino Oy, Kaleva Oy ja KPK Yhtiöt Oyj (until 2019 Keski-Pohjanmaan Kirjapaino Oyj).

Data on circulation of individual newspapers indicates that a nationwide market is too broad a definition of relevant markets, as the circulation of newspapers being predominantly regional.[10] Hence, it makes more sense to analyse how the average regional concentration has developed over time. In Figure 2, we have illustrated the arithmetic mean of regional concentration in terms of HHI_O and HHI_N in Finland from 1950 to 2016.

The figure confirms that at a regional level, the ownership is quite concentrated. Previous research shows that the dynamics in these markets stems mainly from exits of newspapers due to mergers or ceased operations. (c.f. Björkroth & Grönlund, 2015).

From Figure 3 it is evident that the average degree of ownership concentration, measured with HHI-index, has increased since 1970. By weighing the regional concentration indices with each region's share of total circulation, we got a weighted average degree of concentration for the period. This too showed a continuous increase since the 1970s, although from 2000 onwards the pace of the increase is lower than in the unweighted series. This suggests that ownership concentration is increasing faster in regions with smaller circulation numbers.

[10] According to Björkroth & Grönlund (2015), the audited circulation figures showed for year that on average 92% (median 95%) of the circulation of the regional 7 days a week newspapers comes from their home province. There were only three newspapers with less than 85% of their circulation coming from their home province. For four of five 7-day newspapers, the share of home province circulation exceeds 90%.

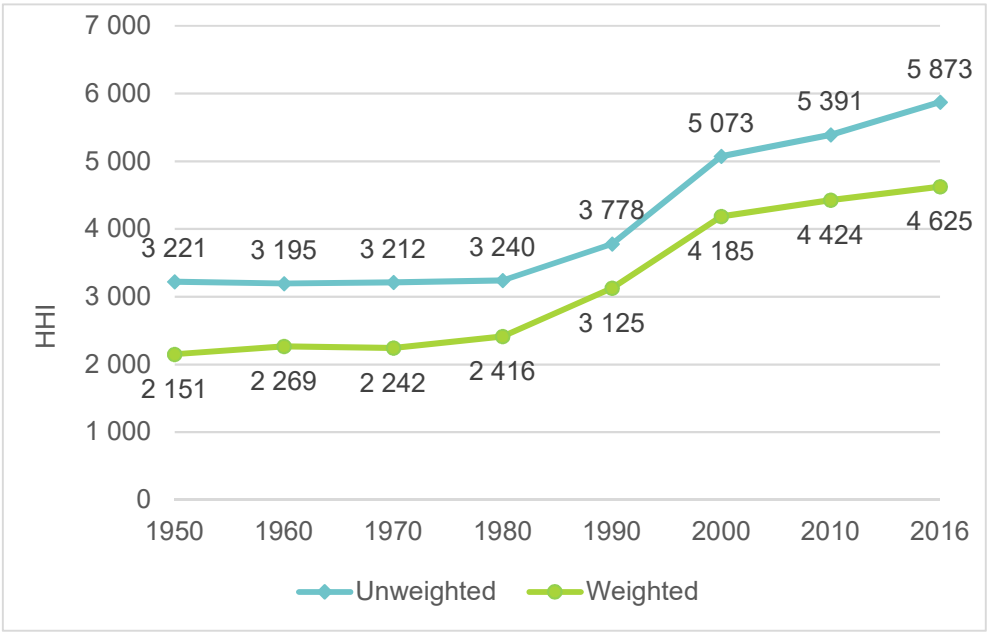

Figure 3. Average regional HHI of ownership in newspaper publishing 1950-2016

The average figures effectively conceal the differences between regions as to what extent the measures HHI_O and HHI_N correlate over time. In most of the regions, we found a positive correlation between the newspaper-level and ownership-level concentrations (Figure 4). In terms of equivalents[11], this suggests that since 1990, fewer newspapers are concentrated in the hands of fewer owners.

[11] Theoretical number of firms when the maximal HHI is divided by the actual size of the HHI. This yields the (theoretical) number of firms with equal market shares.

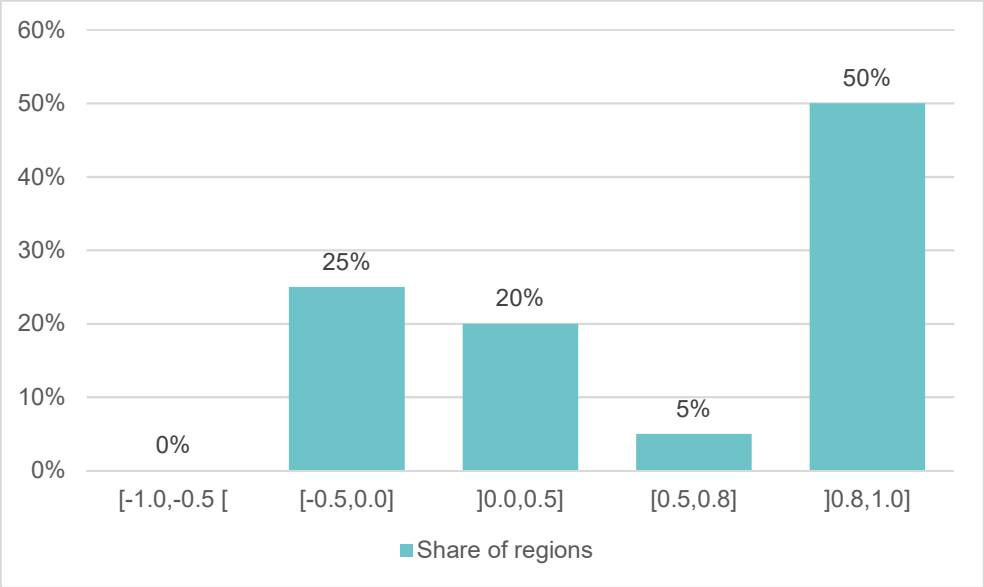

Figure 4. Distribution of regions according to the correlation between HHI-O and HHI-N

The negative correlation, i.e. growing ownership concentration is combined with a decreasing concentration on newspaper level, can be explained by the leading regional newspaper having lost market shares in circulation to other, or relatively more, newspapers in the industry, although they might be owned by the same firm.

3.3 Type and degree of cross-ownership

From the data on direct horizontal shareholdings in the Finnish newspaper industry, we identified some substantial degrees of cross-ownership between the major newspaper publishing companies. In some cases, the degree of cross-ownership implies that our assumption of the cross-ownership reflecting only a passive interest in rivals' profits may be a simplification. We also observed interlocking directorates between the firms, i.e. the stakes in rivals have resulted in rivals having common board members as well.

Additional features that could affect the effective concentration are the existence of joint ventures, the indirect ownership of several rivals and that some newspapers have common institutional shareholders.

We will, for the sake of simplicity and in order to construct a benchmark for the cross-ownership and the degree of effective concentration, analyse the effect of cross-ownership in isolation. This should yield a minimum effect of cross-ownership. The features mentioned above enhance the effective concentration levels, but this will be addressed in the discussion of the results.

Table 1 below summarizes the direct horizontal cross-ownership between the 82 newspaper publishers in 2016. It reveals that the degree of cross-ownership exceed 20 per cent in two occasions: *Ilkka-Yhtymä Oyj*[12] holds a 27.3 per cent stake in *Alma Media Oyj* and *KSF Media Ab* owns 21 per cent of *Nya Ålands Tidningsaktiebolag*. Other stakes that exceed the 10 per cent level are *Ilkka-Yhtymä Oyj*'s stake of 15.4 per cent in *Keski-Pohjanmaan Kirjapaino Oyj* and *Keskisuomalainen Oyj*'s share of 11.3 per cent in *Kustannus Oy Demokraatti*.

[12] Oyj is Finnish acronym for publicly listed company (Plc). Oy is Finnish language acronym for limited company (Ltd). Ab is Swedish language acronym for limited company (Ltd).

Table 1. Percentage of shares held by and in rival undertakings in 2016

Firms i (Holding shares in firms i)	Firms i (Percent of shares in)											
		Alma Media Oyj	Förlags Ab Sydvästkusten	Ilkka-Yhtymä Oyj	Keski-Pohjanmaan Kirjapaino Oyj	Keskisuomalainen Oyj	KSF Media Ab	Nya Ålands Tidningsaktiebolag	Pohjois-Karjalan Kirjapaino Oyj	Sanoma Oyj	Kustannus Oy Demokraatti	+ 72 other publishers
	Alma Media Oyj				5.6 %							
	Förlags Ab Sydväst-kusten											
	Ilkka-Yhtymä Oyj	27,3 %			15.4 %							
	Keski-Pohjan-maan Kirjapaino Oyj			4.1%								
	Keskisuo-malainen Oyj	1.0%		1.4%	2.0 %						11.3 %	
	KSF Media Ab		2.0%					21.0 %				
	Nya Ålands Tidnings-aktiebolag											
	Pohjois-Karjalan Kirjapaino Oyj			2.4%		0.2%						
	Sanoma Oyj		9.7%									
	Kustannus Oy Demo-kraatti											
	+ 72 other publishers	*No cross ownership*										

No cross ownership

Table 1. Paid-for newspaper titles per company and region in 2016

	Alma Media Oyj	Förlags Ab Sydvästkusten	Ilkka-Yhtymä Oyj	Keski-Pohjanmaan Kirjapaino Oyj	Keskisuomalainen Oyj	KSF Media Ab	Nya Ålands Tidningsaktiebolag	Pohjois-Karjalan Kirjapaino Oyj	Sanoma Oyj	Kustannus Oy Demokraatti
Uusimaa	2*				5	1* + 4			2*	1*
Southwest Finland	1	2								
Satakunta	5									
Kanta-Häme	1				2					
Pirkanmaa	5									
Päijät-Häme										
Kymenlaakso										
South Karelia								1		
South Savo					3					
North Savo					11					
North Karelia								6		
Central Finland	2				7					
South Ostrobothnia			5							
Ostrobothnia				1						
Central Ostrobothnia				3						
North Ostobothnia	2		2	4						
Kainuu										
Lapland	2									
Åland							1			

* National newspaper title. Dark grey colour of the box indicates the location of headquarters of the company.

The total stake held by rivals exceeded one-fifth in the case of *Alma Media Oyj* (28.3%), *Keski-Pohjanmaan Kirjapaino Oyj* (23 %) and *Nya Ålands*

Tidningsaktiebolag (21 %). No (significant) cross-ownership is reported for 72 newspaper-publishing companies, of which some held significant national and regional market shares.

The calculation of the weighing matrix $\widetilde{W}$ is rather straightforward as there is a mutual cross-ownership only in the case of *Ilkka-Yhtymä Oyj* and *Keski-Pohjanmaan Kirjapaino Oyj*. Assuming proportional control, the weighing matrix for MHHI will be as follows.

$$\widetilde{W} = \begin{bmatrix} 1 & 0 & 0 & 0.0053 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & \phi_{1,82} \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & \phi_{2,82} \\ 0{,}1448 & 0 & 1 & 0{,}0128 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & \phi_{3,82} \\ 0 & 0 & 0{,}009 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & \phi_{4,82} \\ 0{,}0002 & 0 & 0{,}0002 & 0{,}0007 & 1 & 0 & 0 & 0 & 0 & 0 & \cdots & \phi_{5,82} \\ 0 & 0{,}009 & 0 & 0 & 0 & 1 & 0{,}0707 & 0 & 0 & 0{,}0162 & \cdots & \phi_{6,82} \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & \cdots & \phi_{7,82} \\ 0 & 0 & 0{,}0007 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & \cdots & \phi_{8,82} \\ 0 & 0{,}0122 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & \cdots & \phi_{9,82} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & \cdots & \phi_{10,82} \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ \phi_{82,1} & \phi_{82,2} & \phi_{82,3} & \phi_{82,4} & \phi_{82,5} & \phi_{82,6} & \phi_{82,7} & \phi_{82,8} & \phi_{82,9} & \phi_{82,10} & \cdots & 1 \end{bmatrix}$$

In order to calculate the *MHHI* we will multiply the 82x82 weighing matrix with the vector and transpose of market shares for each publisher.[13] This yields a *MHHI* of 965.7, leaving the *ΔMHHI* at 9.81 or to 1 percent of the *HHI*. This is in line with the results in Campos & Vega (2002), who also report quite a small difference between *HHI* and the *GHHI*, although our results depended on the assumptions regarding the degree of control in the owned firm.

[13] This weighing matrix can be used for the calculation of regional *MHHI*s, since if firm *i* or *j*, or either, is not present in a region, the market share will be zero and the weight for a particular cross-ownership will affect the *MHHI* of that region.

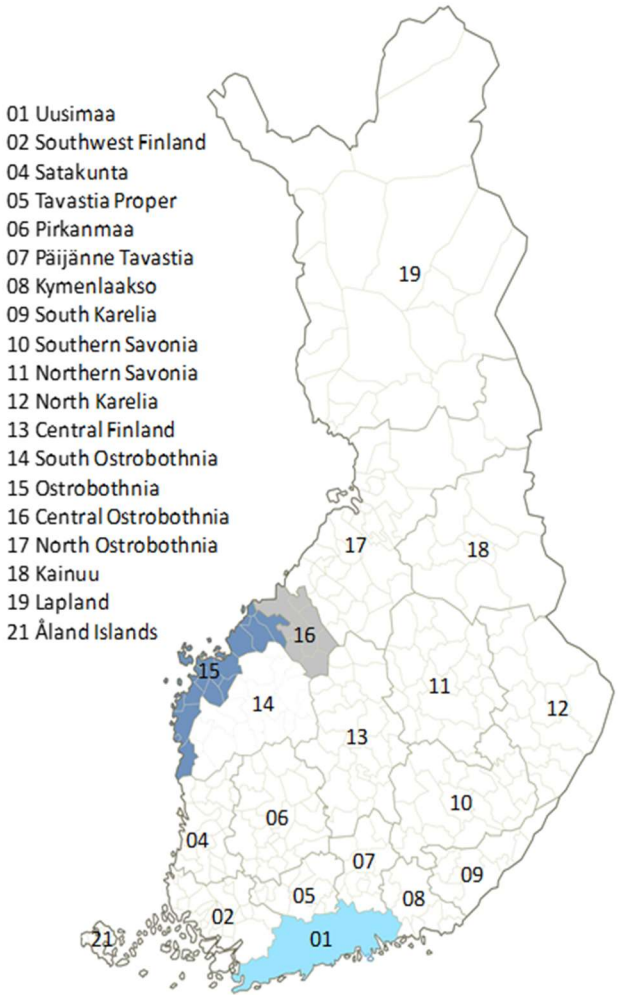

Figure 5. Finland's 19 regions

In the Table 3 below, we have summarized the results for entire Finland together with the regions of Uusimaa and Ostrobothnia, where the effect of cross-ownership is potentially largest due to cross-ownership.

In Uusimaa and Ostrobothnia, the *ΔMHHI* was 0.07 and 3.40 respectively, which is modest, being less than 0.01 percent of *HHI*.

Table 3 includes an analysis where we have artificially merged the regions Ostrobothnia and Central Ostrobothnia, to form one hypothetical

geographical market with about a quarter of Million inhabitants.[14] The result was that the cross-ownership yielded a *ΔMHHI* of 27.7 points, which is 0.92 percent of the *HHI,* which is a rather modest increase. We will see below that assuming a one-sided market and Cournot competition, the relative percentage change in effective concentration coincides with the relative percentage change in profitability.

Table 3. HHI, MHHI and ΔMHHI in year 2016 for selected geographical regions

REGION OR AREA	CIRCULATION / INHABITANTS (000'S)	HHI	MHHI	ΔMHHI
FINLAND	2.389/5.503	955.9	965.7	9.81
UUSIMAA	880.0/1.638	2942.37	2942.45	0.07
OSTROBOTHNIA	65.8/181.4	3992.71	3996.11	3.40
OSTROBOTHNIA + CENTRAL OSTROBOTHNIA	97.4/250.4	2998.78	3026.49	27.70

[14] Merging these geographical areas are surely hypothetical and does not here consider that firm strategies and market structure may be endogenous to the size of the geographical market. It only serves as an example to illustrate the effect of mutual cross-ownership.

4 Effect of cross-ownership on profitability and the potential fallacy in omitting two-sidedness

4.1 Assessment with measures developed for one-sided markets

For a traditional single-sided business, profit maximization occurs when it produces at a level output at which marginal revenue equals marginal cost. This yields the familiar equilibrium result for oligopoly stating that the relative price marginal-cost margin equals the ratio of market concentration (HHI) to the absolute value of the own-price elasticity of demand.

Our results indicate that under assumption of proportional control, the cross-ownership between newspaper publishers do not seem to raise any concerns regarding its possibilities to strengthen the market power of the firms. The regional markets are quite concentrated already and the cross-ownership is less apparent between firms active in the same region.

What this degree of concentration means for weighed industry profitability depends on the price elasticity of demand. Nikali (2014) reported a price elasticity of demand (η) at national level of -.58 for printed newspapers, while Luostarinen (2015) indicated a demand elasticity of -.37. [15]

If we assume that η=-.58 the national level HHI of 955.9 and MHHI of 965.7 would suggest that the effect of cross-ownership is to increase the weighted relative price cost margin from 0.165 to 0.1665, i.e. with 0.9%. For the regions of Uusimaa and Ostrobothnia, the cross-ownership does not materially alter the industry Lerner index of 0.507 and 0.69, respectively.

[15] Nikali (2014) used a macroeconomic model with times series from 1990-2013, while Luostarinen (2015) used data from years 2006-2013 to estimate the effect of the introduction of VAT on newspaper demand and obtained the relation between the changed quantity and price change from this.

Assuming inelastic demand η=-0.58 and accounting for (proportional control) cross-ownership in the combined region of Ostrobothnia and Central Ostrobothnia implies an increase of the industry Lerner index from 0,517 to 0.522, i.e. also with 0.9 per cent. Assuming η=-.38 does not materially alter the effect, since an increase of the industry Lerner index in this hypothetically combined region would then be from 0.789 to 0.796, i.e. with 0.9 per cent.
How about the advertising side? We calculated the HHI, MHHI and ΔMHHI for newspaper advertising revenues for the combined region of Ostrobothnia and Central Ostrobothnia. In the calculation of MHHI, we used the same weighing matrix as for the circulation side of the market. The obtained values were HHI=3379.3, MHHI=3404, which yields ΔMHHI=24.7. Consequently, the concentration indexes are significantly higher on the advertising side of the market. This is in line with earlier results of the Finnish market (Björkroth & Grönlund, 2011, 47), but differs from observations by Filistrucchi et al.(2012) in that in the Dutch newspaper market the HHI on advertising side was 15 to 23% lower than on the circulation side.

Table 4 reports the values of the concentration index, and what accounting for cross-ownership would imply for the relative price cost margin L and changes therein (ΔL, in percent) with arbitrarily chosen absolute values of demand elasticities of 0.5, 0.1 and 1.5 and 2.0 if the market for advertising is treated as a one-sided market.

Table 4. Concentration indexes and price-cost margins for newspaper advertising in the combined region of Ostrobothnia and Central Ostrobothnia in 2016.

	$L_{\|\eta_A=0.5}$	$L_{\|\eta_A=1.0}$	$L_{\|\eta_A=1.5}$	$L_{\|\eta_A=2.0}$
HHI=3379.3	0.676	0.338	0.225	0.169
MHHI=3404	0.681	0.340	0.227	0.170
ΔL (%)	0.73 %	0.73 %	0.73 %	0.73 %

Table 4 shows that, assuming a one-sided market with strategies in quantities; price cost margin is largely determined by the level of price elasticity of advertising demand. Moreover, the relative increase in concentration affects profits in absolute terms more the higher the market concentration.

However, these baseline results could be simplifications, if they omit existing features of a two-sided market, where the demands on both sides are interconnected through the externalities they impose on each other.

Therefore, they can be used as rough gauges, but a more exact analysis can make use of recent developments in economic theory of two-sided markets.

4.2 Correcting for the two-sidedness of the newspaper market

According to Evans (2008, 675) there are three issues complicating an analysis for two-sided markets. First, the optimal prices depend in a complex way on the demand elasticity on both sides, the nature and intensity of the indirect network effects between the two sides, and the marginal costs that result from changing output of each side. Secondly, the profit-maximizing, non-predatory price for either side may be below the marginal cost of supply for that side or even negative. Thirdly, the relationship between price and cost is complex, and the simple formulas that have been derived for single-sided markets do not apply.

Next, we apply the results of Correia-da-Silva, et al. (2018) showing that for the ratio of HHI to the elasticity of demand to be a good measure of the aggregate Lerner index on a given side, it needs to be adjusted downward with respect to its standard definition for a one-sided market. This adjustment should be greater the larger the network effects and the larger the correlation between market shares on the two sides of the market. We take their result to hold for the modified HHI (MHHI) as well.

The Lerner index for a side *i* (subscriptions or advertising) of newspaper *k* can be denoted as

$$L_i^k = \frac{\hat{p}_i - c_i^k}{\hat{p}_i}$$

where $\hat{p}_i$ is the externality adjusted price of side i.[16] For a single newspaper, the first order condition for its profit-maximizing problem with respect to either side can be written in terms of the traditional Lerner index as:[17]

$$L_i^k = \frac{s_i^k}{\eta_i} - \frac{\alpha_1 + \alpha_2}{\hat{p}_i} N_j s_j^k$$

At the industry level (adding over all k newspapers), this becomes:

$$L_i = \frac{HHI_i}{\eta_i} - \frac{\alpha_1 + \alpha_2}{\hat{p}_i} S N_j = \frac{HHI_i - \frac{\alpha_1 + \alpha_2}{\hat{p}_i} S \eta_i N_j}{\eta_i}$$

In the expression above, we follow Correia-da-Silva et al. (2018) and denote the second term in the numerator an adjustment term g_i, i.e.

$$\frac{\alpha_1 + \alpha_2}{\hat{p}_i} S \eta_i N_j = g_i$$

It seems $g_i > 0$ and that

$$\frac{\partial g_i}{\partial \alpha_1} > 0, \frac{\partial g_i}{\partial \alpha_2} > 0, \frac{\partial g_i}{\partial S} > 0, \frac{\partial g_i}{\partial \eta_i} > 0, \frac{\partial g_i}{\partial N_j} > 0$$

which means that the adjustment term increases with the increase of:

[16] In a Cournot equilibrium where all newspapers are active on both sides, the externality-adjusted price on a given side are defined as $\hat{p}_i = p_i^k - \alpha_j n_j^k$, where α_j is denotes the increase in utility of a consumer on side i when there is increased participation on side j. α_j is assumed to be positive. On an aggregate industry level, the Lerner index is defined as: $L_i = \sum_{k=1}^{K} s_i^k L_i^k$, where s_i^k denotes newspaper k's market share on side i of the market. η_i denotes the demand elasticity on side i. In this context $i,j=1,2$, but $i \neq j$.

[17] See Correia-da-Silva et al. (2018) for details.

- the utility of one side when the participation of the other side increases (α_1, α_2)
- the correlation between the market shares on both sides of the market (S)
- the elasticity of demand, and
- the participation on the other side of the market.

With all other things equal, the adjustment term decreases with the increase of the externality-adjusted price $\hat{p}_i$. This externality adjusted price increases (ceteris paribus) with an increase of price level on that side, whereas increases in utility and degree of participation on the other side decrease $\hat{p}_i$ and contributes to an increase in g_i.[18]

If we assume that the increase in cross-ownership affects only the concentration ratio HHI and not the variables in the correction term, we may replace the HHI with MHHI and denote the Lerner indexes $L_i(HHI)$ and $L_i(MHHI)$ respectively[19]. As all the variables in the correction term are strictly positive, the price-cost margin for a side *i* in a two-sided market will be lower than in the case of a one-sided market. However, as we are interested in the effect of cross-ownership on profitability and the estimation of the variables in the correction term is beyond the scope of this paper, we may still assess the relative change in the Lerner index while keeping the correction term constant.

Since the correction term is positive, the traditional measure of *HHI* or *MHHI* in relation to elasticity denotes the maximal profits.

If we denote the correction term with g_i, and assume it will not change in response to increase in cross-ownership, the relative increase in the price cost margin on side *i*, $\dot{L}_i$, can be calculated as:

[18] See definition of the externality-adjusted price in footnote 14.

[19] As S is defined as a sum of products of the market shares on both sides of the market, it is possible that cross-ownership can affect the "correlation" between the market shares at ownership level. This means that the numerator decreases and the denominator increases, which means (ceteris paribus) that the change in Lerner index will get smaller for a given increase in ΔMHHI.

$$\dot{L}_\iota = \frac{L_i(MHHI_i) - L_i(HHI_i)}{L_i(HHI_i)}$$

$$= \frac{\frac{MHHI_i - HHI_i}{\eta_i}}{\frac{HHI_i - g_i}{\eta_i}} = \frac{\Delta MHHI_i}{HHI_i - g_i}$$

This equation echoes the finding of Correia-da-Silva et al (2008) in that the role of elasticity of demand seems to diminish. It is, however still present in the correction term g_i.

With g_i>0, the increase in relative profitability from cross-ownership in both circulation and advertising sides is larger when we consider the two-sidedness. With $g_i = 0$ the results would coincide with those of a one-sided market, but without exact knowledge about the correction term, we can only state that the effect of cross-ownership on the margin on the circulation side is at least of the magnitude calculated for the one-sided market. It is clear from the equation above that $\frac{\partial \dot{L}_\iota}{\partial g_i} > 0$, and since we know which factors increase g, the price cost margin increases (ceteris paribus) with i) the utility of the to the one side of the participation on the other of the side(s), ii) the correlation between the market shares on both sides of the market (S), iii) the elasticity of demand, and with the participation on the other side of the market. These effects may blur the effect of increase of cross-ownership on the relative profitability.

5 Conclusions

This article analysed the effects of horizontal cross-ownership on effective market concentration in the Finnish newspaper publishing industry. The industry has been characterised by a high level of ownership concentration, which has increased over the decades. The concerns arising from a concentrated market structure to sustain a competitive market were initially strengthened by the observation of some substantial horizontal cross-ownerships. However, our analysis of the effect of these cross-ownerships at the regional level and inferences on what they would mean for the average industry profitability showed that the effects are small. Considering the corrections required due to the nature of two-sided markets do not materially alter this conclusion.

This is to say that the cross-ownerships, when we exclude the effects of joint ventures, common owners, or of influence that goes beyond a passive shareholding, do not materially alter the level of concerns stemming from the concentrated market structure. It seems likely that, despite considering these features, as long as the markets for daily newspapers are mainly regional, the main concern is the high concentration itself. Nevertheless, high concentration has a potential to boost the effect of cross-ownership as to attain larger profits. This warrants a critical approach to attempts to increase the cross-ownership further.

Future avenues of this research include alternative assumptions regarding the degree of control associated with the shareholdings and incorporating the effects of common owners. Finding empirical evidence on the magnitude of the correction for two-sidedness would also contribute to a more realistic view of effects of the effective rates of market concentration. Audited circulation figures of newspapers that we used in calculating the Herfindahl-Hirschman index (HHI), have traditionally provided a standardized, authoritative statement of a publication's printing, distribution, and readership. . However, during the last couple of years, some of the newspapers, including the two national tabloids, have stopped auditing their circulations and those newspapers are reporting only their readership figures.

If this becomes an increasing trend within the newspaper publishing industry[20] the measuring of concentration becomes very difficult and eventually impossible. Therefore, there is an increasing need to create new and reliable ways to measure concentration in the future.

[20] Within the Finnish magazine publishing industry, it is already qite common not to audit the circulation of the titles.

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