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Abstract

This paper examines the competition in the print newspaper advertising market in New Zealand, which involves paid daily and free weekly titles. This is the first study to explore how different ownership structures across two newspaper segments affect the competitive forces in local geographic markets. We do so by constructing an original dataset of advertising rates. This has particular relevance in light of the Commerce Commission's recent rejection of the proposed NZME-Fairfax merger, and Fairfax's subsequent closure of 15 newspaper titles. We find strong evidence for competition between overlapping free weekly suburban titles. It is associated with a 11% decrease in the full tabloid page display advertising rate. We also find evidence of joint profit maximization between co-owned free weeklies and paid dailies. Our results support the Commission's decision and give crucial implication on market definition: small and large display ads in free weekly titles constitute two separate markets with different clients. The large display ad market also includes advertising in paid daily titles. This market is competitive and will likely suffer if the merger were granted.

JEL classification: D12; L11; L13; L41

Keywords: newspaper; print advertising; ownership structure; competition; merger

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1 Introduction

Over the past decades the print newspaper industry has undergone two well-documented changes: the number of paid daily titles has declined, and the concentration of ownership across all segments has increased. To these larger changes might be added an increase in the number of small local titles.[1] A result of these changes is the increased monopolisation of local newspaper markets. Even in markets with multiple titles, it is increasingly common for them to be owned by the same publisher. The analysis of these ongoing trends in the literature has typically focused on publishers owning a single title in a geographic market, sometimes from the merger of titles in the same segment. No paper has explored the possibility of a monopolist publisher owning multiple titles, possibly across different segments, in the same geographic market may set prices jointly to maximize total profit. In particular, if newspapers of different segments are viewed as substitutes by at least some advertisers, monopolist publishers may set their advertising rates to push the marginal advertiser to the more profitable outlet. In this paper we study the general competition landscape in newspaper print advertising in New Zealand, an industry characterized by high concentration of ownership over two segments. Our empirical study involves local markets with publishers owning various kinds of newspaper portfolios, and fills the gap in the literature that mostly focuses on single-title monopolies.

How many different ways can an oligopoly publisher take advantage of market power? In a two-sided media market, a firm has three groups of strategic variables: product characteristics; retail or subscription prices; and advertising rates. The economics literature on newspapers has not dedicated equal attention to all three strategic variables. Rather, newspaper content differentiation has been studied much more heavily than the latter two price variables. Another monopoly behavior analyzed includes the gerrymandering of distribution areas. A large part of the early literature on the economics of newspapers was concerned with explaining how titles of different sizes and types were able to co-exist in the same geographical market. Monopolistic competition, in which newspapers differentiate themselves by content, was invoked to explain how a broadsheet (quality newspaper) and tabloid (sensational newspaper) could co-exist. If readers have heterogeneous preferences on the "quality" of newspaper content, they may also

[1] Lacy and Simon (1997) discuss the decline in the number of daily newspapers in the U.S. Lacy, Coulson, and Cho (2001) and Coulson, Lacy, and Wilson (2001) document the increase in the number and circulation of weekly newspapers.

differ on the proportion of "local" news they prefer to consume. Thus, by the same token, monopolistic competition could also explain the coexistence of titles of different distribution sizes, with different degrees of "localness", in the same geographic market. Together, they help explain the coexistence of paid daily city newspapers and free weekly suburban newspapers, despite the high fixed cost of the first copy for each title. The growth of weekly suburban newspapers is a relatively recent phenomenon, taking place against the long-run declining trend of large metropolitan dailies. Most studies on industry consolidation focus on its impact on newspaper content, not prices. Our paper fills this gap in the literature by focusing on the advertising rates of free weekly suburban newspapers (which have no retail or subscription prices).

The print newspaper industry in New Zealand offers a unique setting to explore the competitive relationship among two newspaper segments: paid daily city newspapers and free weekly suburban newspapers. Each of the largest eighteen metropolitan centres has a single paid daily title and a number of free weekly titles. Readers purchase or subscribe to the former, while the latter are delivered freely to all mailboxes within a geographical area chosen by the publisher. All but one of the paid dailies is owned by either Fairfax New Zealand Limited[2] (henceforth Fairfax) or New Zealand Media and Entertainment (henceforth NZME). Together, these two media corporates own the majority of the free weekly titles. The remaining free weekly titles are owned either by regional or local independent groups. The variation in ownership is such that, in some markets, the paid daily and free weeklies are owned by the same publisher; in other markets, they are owned by rival publishers. In addition, in some markets there is competition between overlapping free weeklies by different publishers; in other markets, the free weekly segment consists of local monopolies.

In this paper we construct an original dataset of advertising rates to explore how they correlate with different local ownership structures. We collect rates for various sizes of display advertising, plus classified advertising rates, from current rate cards of 94 titles. Thus we are able to examine the effect of local ownership structure on different advertising products, which may constitute different advertising markets. We attempt to answer questions such as the following: Which rival exerts more competition on a free weekly: a rival overlapping free weekly or a rival paid daily? If joint ownership exists in a local market, do the advertising rates re-

[2]Renamed Stuff Limited in February 2018

flect the publisher's joint profit maximization, across titles and across all advertising products? We focus on the advertising rates of free weeklies because they have pricing decisions on the advertising side only. Although newspapers are a textbook two-sided market, these free weekly suburban titles have no retail or subscription prices. We treat readers as passive receivers of the freely delivered newspapers. Thus, our analysis on advertising rates is not complicated by endogenous choices on the readers' side of the market. We do test this assumption on reader passivity with additional data on newspaper quality at the end of our analysis.

The competitive effects explored in this paper are not only of academic interest. The New Zealand Commerce Commission recently declined a merger application from Fairfax and NZME[3]. A substantial portion of their final determination is devoted to the potential lessening of competition between overlapping rival free weekly newspapers. While the determination relies on qualitative arguments on the lessening of competition in the free weekly newspaper market, our study offers empirical evidence on the price effects from both the loss in competition and the increased joint ownership across segments. Subsequently, Fairfax closes 15 of its free weekly suburban titles in April-May 2018. Thus, our study continues to be relevant in the absence of a merger.

Our main results are as follows. We find strong empirical evidence of competition between overlapping rival free weeklies in the full tabloid page display advertising market. We also find evidence of joint profit maximization, again in the full tabloid page display advertising market, when the paid daily and free weeklies in a geographic market are jointly owned by the same publisher. These results are both statistically and economically significant. The former is associated with a 11% decrease in the average advertising rate, while the latter is associated with a 28% increase in the average advertising rate per copy circulated. They support and complement the Commerce Commission's decision on the Fairfax-NZME merger. We find weak evidence of competition in other advertising products, and between the two newspaper segments if they are under rival ownership. We believe that the different results from the different advertising products are suggestive of two separate advertising markets: a market of smaller display ads for local businesses, and a market of larger display ads, across the two newspaper segments, for national businesses. This means that there exists a marginal advertiser who substitutes between

[3] http://www.comcom.govt.nz/the-commission/media-centre/features/the-nzmefairfax-final-decision/

a full tabloid page display ad in a free weekly and display advertising in a paid daily. This market is more competitive, and thus is likely to suffer more as a result of Fairfax's closure of 15 titles.

The rest of the paper is organized as follows. Section 2 lists key papers in the literature on which we build our work. Section 3 gives a background on the print newspaper industry in New Zealand and Australia, highlighting its difference from that in North America. Section 4 documents the construction of our original dataset. Section 5 presents our empirical analysis on newspaper advertising rates, circulation, and market structure variables. Section 6 concludes.

2 Literature Review

Two early seminal articles on the economics of print newspapers, Corden (1952) and Reddaway (1963), identify the key strategic variables and dimensions of competition in the industry—revenues from sales and advertising, and categories of costs that are fixed; that change quality; that vary with circulation; and that are directly due to advertising. While Reddaway offers an exhaustive list of choice variables available to newspaper publishers, the subsequent literature has focussed on selling price to the public, advertising rates, and the scope and quality of the content (product characteristics). With the notable exceptions of Chandra (2009) and Fan (2013), most subsequent studies focus on either the price-based aspects of competition (selling prices and advertising rates), or the non-price based aspects of competition (mainly content), while in each case holding the other variables constant.

Recent studies of price-based aspects of the print newspaper industry have taken the theory of two-sided markets as their starting point (Rochet and Tirole (2003); Rochet and Tirole (2006); but see also Thompson (1989) and Chaudhri (1998)). Newspapers are a canonical example of a two-sided market, because the value of advertising space to advertisers depends on the number and characteristics of readers. The value of the newspaper to readers also partly depends on advertising, although researchers have found both positive and negative impacts. A number of recent empirical studies of print media pricing behaviour have estimated the elasticities of demand from both consumers and advertisers. These include Argentesi and Filistrucchi (2007), which is a study of the Italian newspaper industry; Filistrucchi, Klein, and Michielsen (2012), a study of a hypothetical merger in the Dutch newspaper industry; and Kaiser and Wright (2006), a study of the German magazine industry. A general finding is that advertisers subsidize readers.

Chandra and Collard-Wexler (2009) find that mergers in the Canadian newspaper industry are not associated with either higher advertising rates or higher selling prices. Finally, Asplund, Eriksson, and Strand (2008) find that titles with direct competitors engage in third degree price discrimination by selling a larger share of their copies via discounted subscriptions.

Studies on newspapers' non-price responses to competition, including the impact of mergers, have focused on variation in content and distribution areas. George and Waldfogel (2006) study the expansion of the *New York Times* and find that local newspapers respond by shifting their content away from international and national news towards local news. The shift in content comes at the expense of college-educated readers while adding non-college educated readers. Similarly, Chandra (2009) finds that newspapers facing competition vary their content to attract readers of greatest value to advertisers. On newspaper mergers, Coulson, Lacy, and Wilson (2000) argue that there are operational efficiencies, while Lacy (1987) points to the cheaper content of monopolist publishers, who use fewer journalists and wire services, relying on cheaper sources of news. On distribution areas, Lacy and Simon (1997) examine the case of publishers that own titles in adjacent counties gerrymandering distribution boundaries to minimize competition between their titles.

The literature has paid relatively little attention on the impact of joint ownership of titles within geographic markets, despite its increasing prevalence. Lacy and Simon (1997) report that between the 1920s and 1996 the number of daily newspapers in the U.S. fell by a third, while the proportion of titles owned by groups that owned multiple titles increased from 7.5% to 77%. The number and circulation of weekly titles increased during this period. While the monopolisation of geographic markets is not reported, Coulson, Lacy, and Wilson (2001) report that in media company mergers, "two thirds of purchases of weekly newspaper groups have involved a daily in the same market." Thompson (1989) notes that most newspapers in the UK are owned by publishers that own multiple media assets, including other newspapers. Chandra and Collard-Wexler (2009) document similar increases in the concentration of ownership of newspaper titles in Canada. Chaudhri (1998) remark on the high concentration of newspaper ownership in Australia; Molineaux (1995) and Molineaux (1997) do the same in New Zealand. We will describe the industry in Australia and New Zealand in detail in the following section.

Competition between different types of newspapers operating the same market has been studied in the context of the umbrella model of newspaper competition. Due to Rosse (1975) and

Rosse (1978), the umbrella model incorporates the main features of monopolistic competition and the high fixed cost nature of the industry. According to the model, each metropolitan area is an independent market covered by a single umbrella, so that newspaper titles within each metropolitan area compete with each other, but not with titles published in other metropolitan areas. Under the umbrella, newspapers are grouped into tiers based on the size of their distribution area relative to that of the whole metropolitan area. While Rosse's original tiers were defined empirically for a specific newspaper market (the San Francisco Bay Area), the essential idea is that the top tier contains the title with the largest area of distribution. Each successive tier below the top has more titles with smaller areas of distribution. Lacy and his co-authors have examined competition in the newspaper industry through the lens of the umbrella model, focusing in particular on whether competition from above is more or less important than competition from below (Lacy (1984), Lacy (1987), and Lacy and Davenport (1994)). Their consistent finding, although based on surveys and descriptive statistical work, is that newspapers feel stronger competitive pressure from larger newspapers above than smaller newspapers below (Lacy (1984)). The important conclusion of this research is that newspapers of different sizes are operating in the same market, and that there is a marginal buyer and marginal advertiser who may switch between titles.

We contribute to the literature on the economics of newspapers by considering the interaction between pricing behaviour and joint ownership of titles. In particular, we consider the situation where publishers own multiple titles across different tiers in a single geographical market. The papers closest to ours are Chandra and Collard-Wexler (2009) and Ferguson (1983). The former investigates the impact of mergers on newspaper cover prices and advertising rates in Canada. Our paper differs from theirs in considering markets where newspapers with overlapping areas of distribution belong to different tiers, rather than one single tier (such as competing paid dailies). Ferguson considers the impact of ownership on strategic pricing across media platforms, specifically the cross ownership of newspaper-radio and newspaper-television assets within a single market. Our study asks similar questions on the advertising rates of free weekly newspapers in markets where publishers own multiple titles.

3 Industry background in NZ and Australia

NZME owns the largest paid daily metropolitan newspaper in New Zealand, the *NZ Herald*, based in Auckland, and five other paid daily newspapers in regional centers around the North Island. In addition, it owns 22 free suburban newspapers, all based in the North Island. Roughly half are delivered to suburban areas where one of NZME's own paid daily newspapers operates; others are served by one of Fairfax's paid daily newspapers.

Fairfax owns four paid daily newspapers in the North Island and five in the South Island. They cover the three largest population centers after Auckland: Wellington, Christchurch, and Hamilton. Fairfax also owns 52 free weekly newspapers.[4] Its titles in the South Island are mostly delivered to suburban areas around its own paid daily newspapers, except those around Dunedin (explained below). Fairfax's other free weekly newspapers, in the North Island, mostly cluster around regional centers served by one of either Fairfax's own or NZME's paid daily newspapers.

Besides these two corporate owners, there are a few independent newspaper publishers in New Zealand. Allied Press publishes the paid daily newspaper in Dunedin, and fourteen free weekly newspapers, delivered to communities on the west coast and lower half of the South Island. Star Media publishes seven suburban free weekly newspapers, all of which are delivered to Christchurch suburbs. Wellington Suburban Newspapers Ltd. publishes three free weekly titles. Sun Media publishes two free weekly titles in Tauranga. Beacon Media Group publishes a free weekly in each of Whankatane and Opotiki. Finally, smaller independent publishers produce single titles in their local communities.

To summarize, we observe a variation in newspaper ownership structure across cities in New Zealand. There are population centers where the paid daily and free weekly newspapers belong to the same owner (Fairfax), such as Nelson and Blenheim. There is Auckland, where the paid daily newspaper belongs to one corporation (NZME) and all other eleven overlapping free suburban newspapers belong to the rival corporate publisher (Fairfax). There are population centers with competition between the two corporate publishers in free weekly newspapers, such as Whangarei, Hamilton, Hawkes Bay, and New Plymouth. There are cities with competition between Fairfax and one of the independent publishers in free weekly newspapers, such as Wellington, Christchurch, Dunedin, Queenstown, and Invercargill. Finally, in Tauranga there is competition between NZME and an independent publisher in free weekly newspapers.

[4]Fairfax also owns some titles published less than once a week. We exclude them in this study.

The situation in New Zealand presents a unique opportunity in light of the earlier studies with endogeneity issues. Here, market penetration of all free weeklies are truly exogenous: All free weeklies are delivered for free to the mailboxes of residents within the circulation area. Readers have no purchase decisions to make. They also have no subscription plans for titles from outside their own circulation area. Readers are passive receivers of these free titles, and they play a much diminished role in a theoretically two-sided market. In our analysis, we focus on the advertising side of the market, in particular the competition for advertisers between different titles both within the same tier and across different tiers.

We identify two distinct newspaper tiers in New Zealand: paid daily city newspapers and free weekly suburban newspapers. There are fewer tiers in New Zealand likely because its metropolitan cities have smaller populations. Population in the greater Auckland area (1.5 million) is roughly six times smaller than that in the greater San Francisco Bay Area (8.8 million). Even the largest metropolitan area, Auckland, does not have satellite cities to speak of. Another difference, arguably more important, between the newspaper market in New Zealand and that in the U.S. or Canada, is the widespread joint ownership of titles across different tiers. This allows us to empirically compare the competitive effects within and across tiers, with and without common ownership. This is particularly relevant for the proposed NZME-Fairfax merger, which would eliminate competition both within and across tiers for many cities, due to the merging parties' heavy presence in print media.

The Australia newspaper market, while larger in size and thus have a tier structure more akin to that in the U.S. and Canada, have a high ownership concentration similar to New Zealand. Two dominant corporations, Fairfax Media and News Corp. Australia, own all major metropolitan titles (with the exception of *The West Australian*, owned by Seven West Media), plus a large number of regional and suburban titles. With a comprehensive reform in media laws in late 2017, the previous ownership rule (the "2 out of 3 rule") that prevents control of more than two of the three regulated forms of media (associated newspapers, commercial radio, and commercial TV) is repealed. Fairfax Media openly declares that they are ready to take advantage of merger opportunities[5]. It is often speculated that Fairfax might seek to merge with Seven West Media, which would further increase concentration in print newspapers. In

[5] https://www.smh.com.au/business/companies/fairfax-ready-to-take-advantage-of-merger-opportunities-20180221-p4z11z.html

addition, both countries are recently experiencing waves of closures in suburban titles, by News Corp. Australia[6], Fairfax Australia[7], and Fairfax NZ[8]. Our empirical results based on the New Zealand market has significant implication for the Australian market because of their great similarity.

4 Data

Unlike studies based in North America, newspaper advertising rates in New Zealand are not centrally collected and available through trade publications such as the *Editor and Publisher International Yearbook*. We construct an original dataset of newspaper titles, advertising rates, and market structure in the following manner. We collect all current (effective 2017) advertising rates for all paid daily and free weekly newspapers. Those owned by NZME and Fairfax are publicly available online. In addition, we request and obtain rate cards from five independent publishers. Table 1 summarizes the number of titles, paid and free, by each publisher in our dataset. It shows that the two corporate publishers dominate the paid newspaper market, sharing it almost equally. However, Fairfax has more than double the number of free titles than NZME. Independent publishers make up about a quarter of all free titles. While we have included the biggest independent publishers in New Zealand, our dataset is not exhaustive, because one publisher did not reply our inquiry on advertising rate cards.

Table 1: Title count by publisher in dataset

Publisher	Paid	Free	*Total*
Fairfax	9	52	61
NZME	7	21	28
Allied Press	1	11	12
Star Media	0	7	7
Wellington Suburban Newspapers (WSN)	0	3	3
Wairarapa Times-Age	1	1	2
Times Media	0	2	2
Total	18	97	115

[6] http://www.newsmediaworks.com.au/leader-closes-seven-melbourne-community-titles/

[7] https://mumbrella.com.au/fairfax-to-shut-six-community-newspapers-11-jobs-to-go-482887

[8] https://www.stuff.co.nz/business/103957279/stuff-closes-15-community-titles-and-sells-another

Advertising rate cards differ in format and specification offerings across titles, and we take great care to arrive at rates for each title that are comparable across titles. First, when comparing display advertising rates between broadsheet and tabloid newspapers, we take the equivalent area. For example, we compare the full-page tabloid display advertising rate to the half-page broadsheet rate. (All free weekly newspapers are tabloid sized. All NZME paid daily newspapers are tabloid sized, while all Fairfax paid daily newspapers are broadsheet sized.) Second, we use the direct advertising rate, as opposed to the agent (commission-bearing) advertising rates, since the former is more widely available, and the use of agents is uncommon for free suburban newspapers. Third, for the minority of titles whose advertising rates are expressed in terms of column-centimeters, as opposed to page area (e.g., full page, half page, etc.), we multiply the column-centimeter rate by the equivalent number of columns and centimeters. For example, a full tabloid page is usually equivalent to 7 columns $\times$ 37cm = 259 column-centimeters. Some tabloid titles divide the page into eight columns instead of seven, and we make sure to incorporate each publisher's idiosyncracies. Fourth, for the minority of titles whose rates for display advertising do not include color, we add in the color processing rate. Among the Fairfax free weekly suburban newspapers that we have access online, almost all pages are full-color, including both the content and display advertising. Fifth, we take the "regular" rate whenever both a "regular" and "casual" rate are listed. We take the "run of paper" rate whenever that and other "premier" rates (e.g. guaranteed front pages, or first half position) or section-specific rates are listed. Sixth, we ignore all forms of bulk discounts, such as "multi-paper buys", "annual spend discounts", and volume discounts in terms of total column-centimeters purchased. Lastly, for classified advertising, we convert all "column-centimeter" rate to "column-liner" rate by assuming that there are four lines per centimeter.

We obtained annual averaged audited circulation numbers from the New Zealand Audit Bureau of Circulations Inc. (`http://www.abc.org.nz/`) for all titles. In addition, readership data is available for NZME and Fairfax's titles from their media kits. Numbers cited by both companies come from Nielsen. Readership numbers for all free weekly suburban newspapers are expressed in terms of number of readers reached per week. For paid daily newspapers to be comparable with that of free weekly newspapers, we use the weekly (as opposed to daily) number of readers reached measure. Readership numbers are usually larger than circulation, because a single newspaper copy delivered to a household is usually read by more than one person. Because we do not have access to Nielsen readership numbers for all titles, we prefer

the use of circulation numbers in our analysis.

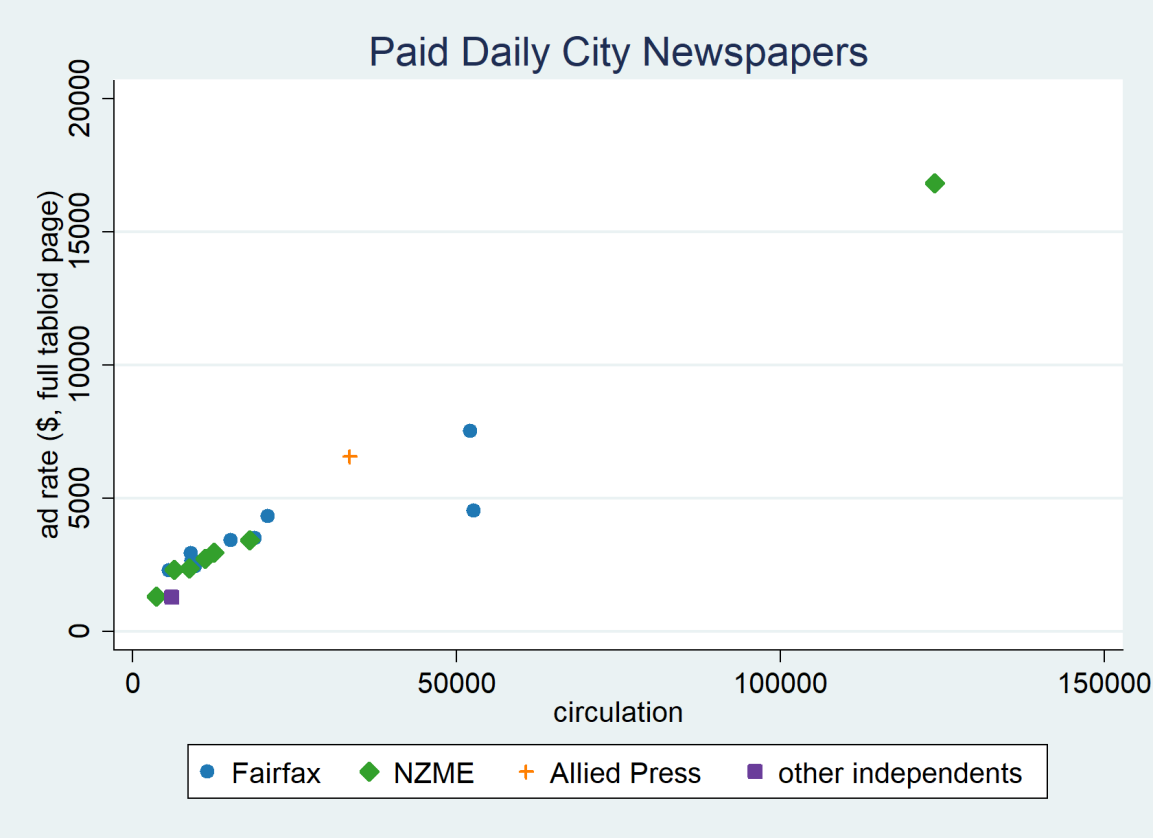
We collected comparable advertising rates for the following specifications. For display advertising, we collected the printed rates for full-, half-, and quarter-tabloid page areas. For classified advertising, we collected the "per column-centimeter" rate. We first explore the display advertising rates. Figure 1 contains two scatter plots of full page display advertising rate against circulation. The first graph shows all paid daily city newspapers, and the second graph shows all free weekly suburban newspapers. In the second graph we have also identified the Fairfax titles that have closed in 2018. These graphs serve as a visual summary of our dataset. We note that there is no stark division in size (by circulation) between paid and free newspapers around New Zealand. Excluding the four biggest paid titles[9], the circulation figures of all other paid titles have the same order of magnitude (in tens of thousands) as most free titles. This is likely a combination of the relatively small population sizes of cities in New Zealand, putting a cap on paid titles' subscription numbers, plus the high penetration rate of free titles (due to their free distribution to household mailboxes).

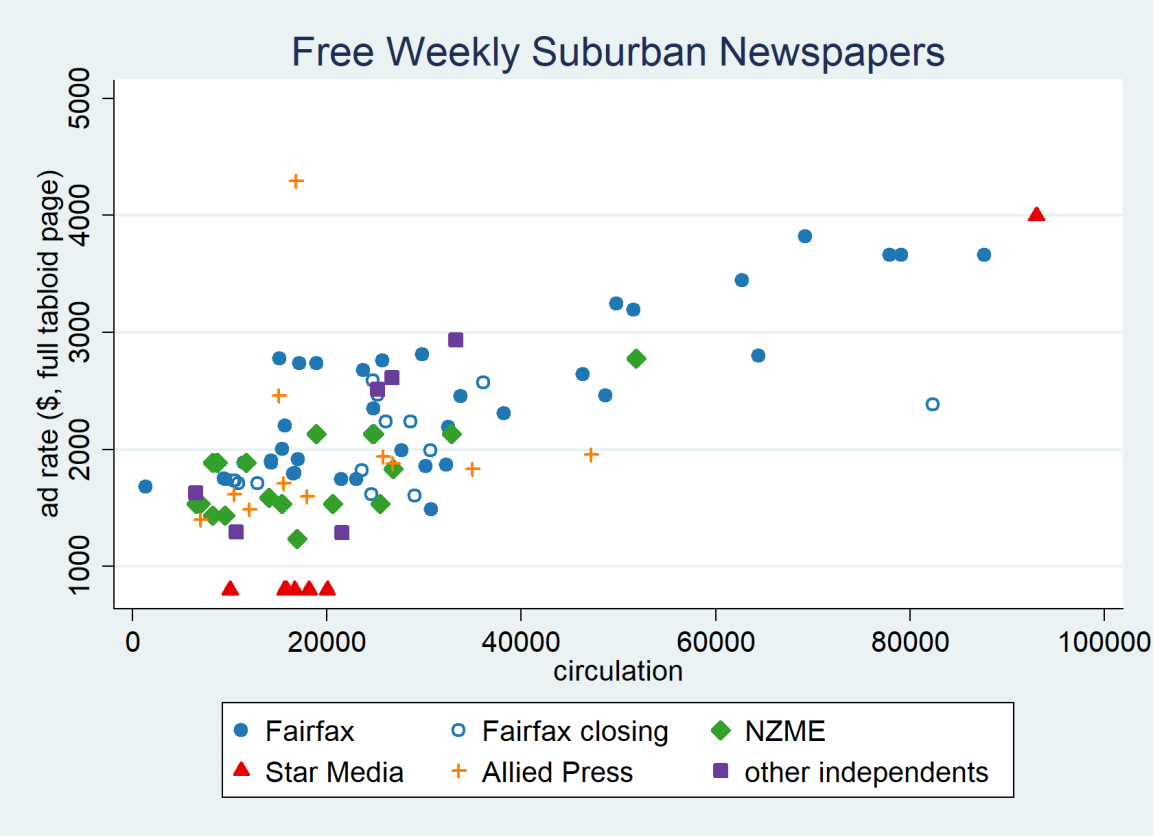
We observe that the display advertising rate has a very strong linear relationship with circulation, across the full range of values, for both paid and free titles of all owners. Indeed, these two variables have a correlation of 0.6387. When we regress this advertising rate on circulation, we obtain a highly significant coefficient and an R^2 value of 0.4079. For the subset of titles with readership data, the correlation between that and advertising rate is even higher: 0.9421. When we regress advertising rate on readership, we obtain a highly significant coefficient and an R^2 value of 0.8875. This is of no surprise, since advertisers ultimately care about the number of eyeballs reached, rather than the number of copies circulated in order to reach those eyeballs. These strong correlations also hold true for half and quarter page display advertising rates, as we will explain shortly. The outlying observation in the top left corner of the second graph of figure 1 belongs to a title in Queenstown. Its high advertising rate is a reflection of the concentration of high-performing businesses, many tourism-related, in the city.

For the majority of the titles, the half and quarter page rates are not exact proportional fractional values of the full page rates. Most offer a slight economies of scale on the advertising rate as ad size increases, although a handful of titles have the opposite pattern. We report all summary statistics on circulation and advertising rates for free weekly suburban newspapers

[9]In descending order: *NZ Herald*, *The Press*, *The Dominion Post*, and *Otago Daily Times*

Figure 1: Display advertising rate for full tabloid page vs. circulation





in table 2. Summary statistics show that the average full-page rate is 1.8 times the average half-page rate, and 3.6 times the average quarter-page rate. However, the average half-page rate is exactly 2 times the average quarter-page rate. Figure 2 shows these two ratios for each title. The left graph contains the ratio of full page rates divided by half page rates; the right graph contains the ratio of full page rates divided by quarter page rates. Most titles have a ratio smaller than two in the left graph, and smaller than four on the right graph, in agreement with our summary statistics. A few publishers (NZME, Star Media, and Allied Press) seem to use the same ratio for all of their titles (except Star Media's largest title, which gives a smaller size discount). Allied Press's advertising rates are perfectly proportional to advertising size, and do not offer any discount on area.

Lastly, we have also collected the column-liner rate for classified advertising, shown in figure 3. They do not seem to show a linear relationship with circulation, unlike display advertising rates. The column-liner rate is under $10 for all but a handful of titles, across the entire range of circulation numbers. We attempt to provide an explanation for this interesting observation in the following section, in combination with our regression results.

Table 2: Summary statistics on circulation and advertising rates of 94 free weekly suburban newspapers

	mean	std.dev.	min	max
circulation	26222.26	19170.61	1396	93000
display advertising rate: full tabloid page	2079.355	724.7007	799	4296.81
display advertising rate: half tabloid page	1150.846	400.6896	599	2595
display advertising rate: quarter tabloid page	575.5846	189.4649	323.75	1295
classified advertising rate: column-liner	3.873436	2.056647	1.1	10.17

5 Results

We use price regressions to explore whether advertising rates are correlated with other variables in addition to circulation, such as market structure. In the regressions that follow, we focus on free weekly suburban newspapers only, for the following reason. We can largely ignore consumers' purchase behavior because these newspapers are delivered for free, by default, to all households within the area of distribution. We are thus able to focus on just the advertising side of an otherwise two-sided market. We will use additional data to test this assumption, that readers

Figure 2: Ratios on display advertising rates

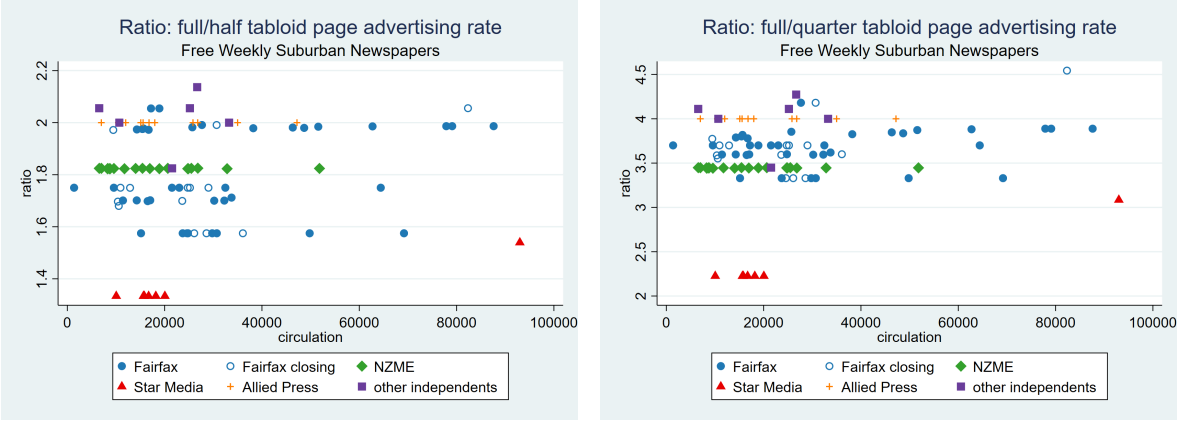
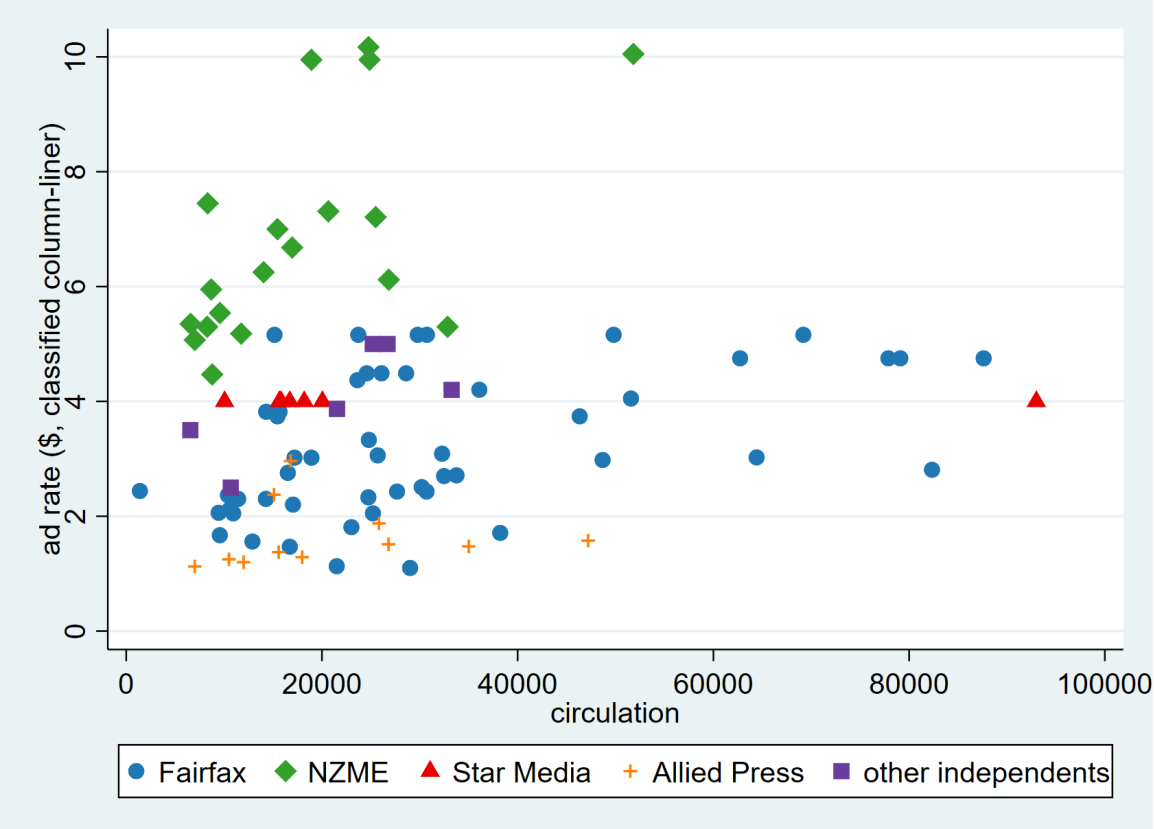


Figure 3: Classified advertising rate vs. circulation



are passive, in subsection 5.1 below. Another reason to focus on the advertising side is that it brings in the majority of a newspaper title's revenue, compared with readers' subscriptions. Free weekly titles naturally have no revenue from subscriptions. Furthermore, it is established by a few studies (Argentesi and Filistrucchi (2007); Kaiser and Wright (2006)) that advertising demand is more price elastic than readers' demand, making the price of advertising a more important strategic variable than the price of subscription (if there is one).

We demonstrate the strong linear relationship between advertising rate and circulation in the previous section. Here we note that the advertising rate might not be the only variable endogenously chosen by the publisher—it can also strategically select a level of circulation by changing its distribution area. In fact, free newspapers can do so more easily than paid ones because the former do not rely on readers' subscription. Their primary concern is the marginal cost of printing and distribution, and the resultant change in catchment area for advertisers. This is similar to the search for the efficient scale of a firm, with the addition of the spatial element of circulation. We address the potential endogenous choice of circulation by publishers in the following way. We use two alternative dependent variables in our regressions: nominal advertising rates, and nominal advertising rates divided by circulation. This also lets us explore whether each of our explanatory variables is more likely to have a simple additive relationship with advertising rate, or a relationship proportional to circulation.

We explore whether the free weekly suburban newspapers respond to the presence of own and rival titles, including independents, when setting their advertising rates. We construct dummy variables of overlap status between each free weekly newspaper with titles of its own or a rival publisher. We consult all available delivery maps and textual description of circulation areas when determining the values of these dummy variables. They take on the value of one whenever there is some degree of overlap: the larger area (of the paid daily newspaper) need not fully encompass the smaller area (of the free weekly newspaper). Among the 97 free weekly titles in our dataset, 39 overlap with a paid daily of one's ownership only; 37 overlap with a rival paid daily only; and 17 have overlaps with both. Thus, local monopoly newspapers are rare in New Zealand, although the number of local rivals (when present) is not large, either. We acknowledge that dummy variables are crude measures of overlap; however, finer measures such as the number of households or businesses in the overlapping area are very difficult to produce at this stage, because distribution maps are not geo-coded. All publishers set distinct distribution areas for their portfolio of free weekly newspapers, thus free weeklies of the same owner have no

overlap with each other.

We present regression results on display advertising rates in tables 3 and 4, and results on classified advertising rates in table 5.

Table 3 is a set of exploratory regressions on circulation and ownership. All six sets of regressions make use of the advertising rates of all three display ad sizes (quarter, half, full tabloid page); with 94 distinct titles, this gives $94 \times 3 = 282$ observations. Columns (1)-(3) use the nominal display advertising rate as the dependent variable, while columns (4)-(6) use the display advertising rate per circulation as the dependent variable. Each of the three ad sizes is given its own coefficient on circulation in columns (1)-(3), and its own constant term in all columns. As the table shows, the constant terms and circulation coefficients are always highly statistically significant, and have very stable magnitudes across different columns. This echoes our data description in the previous section that advertising rates have a very strong linear relationship with circulation. Stacked together, it is also obvious that their relative magnitudes are proportional to their relative ad sizes, with a slight scale discount. Namely, in all columns, the constant term for a full page ad is slight less than double the magnitude of the constant term for a half page ad, which is slightly less than double the magnitude of the constant term for a quarter page ad. There seems to be a bit less scale discount among the circulation coefficients. While the coefficient for a full page ad is slight less than double the coefficient for a half page ad, the coefficient of the half page ad is actually slightly *more* than double the coefficient for a quarter page ad, in columns (1)-(3). In other words, there is a slight scale discount in purchasing a full page display ad, in the average (holding circulation fixed) and also as the marginal cost of additional circulation. Columns (4)-(6) do not use circulation as an explanatory variable, because it is used in the denominator of the dependent variable.

The bottom half of table 3 contains various ownership indicator variables, to explore average pricing patterns by different publishers. Columns (1) and (4) contain one single indicator for independent publishers: all publishers in our dataset, with the exception of Fairfax and NZME, are considered independent. Column (1) shows that independent publishers have significantly lower average advertising rates than corporate publishers. In columns (2) and (5), we break down our seven publishers into their own indicator variables, using Fairfax as the base category. NZME, Star Media, and Wairarapa Times-Age have significantly lower advertising rates in column (2), relative to Fairfax. The latter two publishers, both independent, have particularly large negative coefficients. However, the regression also shows that there is heterogeneity in

Table 3: Regression results: display advertising rates on ownership

dependent variable:	Display advertising rate			Display advertising rate per circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
Circulation * Ad size:						
quarter page	0.00641***	0.00616***	0.00582***			
	(0.00190)	(0.00184)	(0.00183)			
half page	0.0138***	0.0136***	0.0132***			
	(0.00190)	(0.00184)	(0.00183)			
full page	0.0257***	0.0255***	0.0251***			
	(0.00190)	(0.00184)	(0.00183)			
Constant * Ad size:						
quarter page	449.0***	488.2***	538.9***	0.0356***	0.0333***	0.0369***
	(63.46)	(64.66)	(67.89)	(0.00935)	(0.0100)	(0.0110)
half page	829.5***	868.7***	919.5***	0.0675***	0.0652***	0.0688***
	(63.46)	(64.66)	(67.89)	(0.00935)	(0.0100)	(0.0110)
full page	1446.6***	1485.8***	1536.6***	0.119***	0.117***	0.120***
	(63.46)	(64.66)	(67.89)	(0.00935)	(0.0100)	(0.0110)
Ownership indicator variables:						
independent	−162.7***			−0.0136		
	(48.21)			(0.0117)		
Fairfax		—	—		—	—
		—	—		—	—
NZME		−119.3**	−163.8***		0.00851	0.00494
		(53.87)	(56.89)		(0.0134)	(0.0141)
Allied Press		−85.64	−129.2*		−0.000949	−0.00452
		(65.21)	(67.45)		(0.0165)	(0.0171)
Star Media		−478.1***	−519.5***		−0.0350*	−0.0386*
		(78.04)	(79.52)		(0.0200)	(0.0205)
WSN		49.71	5.698		0.0137	0.0101
		(115.5)	(116.2)		(0.0295)	(0.0299)
Times Media		−44.41	−87.56		−0.0107	−0.0142
		(139.7)	(139.9)		(0.0358)	(0.0361)
Wairarapa Times-Age		−481.9**	−525.2***		−0.0351	−0.0386
		(195.5)	(194.9)		(0.0502)	(0.0504)
Closing Fairfax titles			−136.1**			−0.0121
			(59.52)			(0.0153)
R^2	0.946	0.952	0.953	0.460	0.467	0.468
N	282	282	282	282	282	282

* p<0.1, ** p<0.05, *** p<0.01

Table 4: Regression results: display advertising rates on market structure

dependent variable:	Display advertising rate			Display advertising rate per circulation		
	(1)	(2)	(3)	(4)	(5)	(6)
Circulation * Ad size:						
quarter page	0.00709***	0.00691***	0.00695***			
	(0.00190)	(0.00191)	(0.00191)			
half page	0.0145***	0.0147***	0.0147***			
	(0.00190)	(0.00191)	(0.00191)			
full page	0.0264***	0.0264***	0.0265***			
	(0.00190)	(0.00191)	(0.00191)			
Constant * Ad size:						
quarter page	421.3***	421.2***	412.0***	0.0277*	0.0365*	0.0397*
	(84.28)	(101.0)	(101.6)	(0.0160)	(0.0203)	(0.0204)
half page	801.9***	755.8***	746.7***	0.0597***	0.0595***	0.0627***
	(84.28)	(101.0)	(101.6)	(0.0160)	(0.0203)	(0.0204)
quarter page	1419.0***	1465.3***	1456.2***	0.111***	0.103***	0.106***
	(84.28)	(101.0)	(101.6)	(0.0160)	(0.0203)	(0.0204)
Overlap indicator variables:						
With rival paid daily	−28.52	−28.52	−17.89	−0.0145	−0.0145	−0.0188
	(53.58)	(53.47)	(54.84)	(0.0130)	(0.0131)	(0.0134)
With own paid daily	86.83			0.0170		
	(52.67)			(0.0127)		
With rival free weekly	−109.9**			0.00473		
	(44.04)			(0.0107)		
With own paid daily * Ad size:						
quarter page		19.84	25.59		0.00241	0.000192
		(79.90)	(80.20)		(0.0194)	(0.0194)
half page		117.7	123.5		0.0162	0.0140
		(79.90)	(80.20)		(0.0194)	(0.0194)
full page		122.9	128.7		0.0323*	0.0300
		(79.90)	(80.20)		(0.0194)	(0.0194)
With rival free weekly * Ad size:						
quarter page		−36.96	−59.53		0.00403	0.0131
		(74.46)	(78.77)		(0.0182)	(0.0192)
half page		−68.30	−90.88		0.00570	0.0148
		(74.46)	(78.77)		(0.0182)	(0.0192)
full page		−224.5***	−247.1***		0.00447	0.0136
		(74.46)	(78.77)		(0.0182)	(0.0192)
Overlap: Fairfax-NZME free weekly			49.59			−0.0200
			(56.27)			(0.0137)
R^2	0.947	0.948	0.948	0.472	0.474	0.479
N	282	282	282	282	282	282

* p<0.1, ** p<0.05, *** p<0.01

pricing among independent publishers. In addition, columns (3) and (6) add one additional indicator variable for the fifteen free weekly titles that Fairfax is closing in early 2018. Column (3) shows that these closing titles have significantly lower average advertising rates than other surviving titles. These ownership indicator variables do not have much significance in columns (4)-(6). This means that ownership effects are more of a constant value, instead of proportional to circulation.

Table 4 shows the regression of advertising rates on local market structure variables. It shares a few common features with the previous table 3: the same set of observations is used in all regressions; the same dependent variables are used in columns (1)-(3) versus columns (4)-(6); and the same explanatory variables on the top portion: a circulation coefficient and a constant term for each ad size. All circulation coefficients and constant terms are highly significant, and of similar magnitudes to what we have seen in table 3. The slight discount to scale continues to be present. We now dedicate our attention to the overlap indicator variables that denote different competitive forces in the distribution area of each free weekly. Columns (1) and (4) start with three simple overlap variables: with a rival paid daily; with a paid daily by one's owner; and with a rival free weekly. In column (1), all three variables have the signs that we expect: overlap with rival titles, either a paid daily or a free weekly, has negative coefficients. An overlap with a paid daily by the same owner has a positive coefficient. However, only the overlap indicator with a rival free weekly is statistically significant. Overlap with own publisher's paid daily is *almost* statistically significant, with a p-value of 0.100, in column (1). None of these variables are close to statistical significance in column (4).

In columns (2) and (5), we further break down the two overlap indicator variables that are statistically significant (or almost so) by ad sizes, to check if these competitive effects are present equally in all ad sizes. In column (2), the coefficient for overlap with a rival free weekly, for a full page ad, is highly significant, and negative as we expect. The coefficient is also economically significant: the magnitude of the coefficient is about 11% of the average advertising rate of a full page ad in the dataset. The coefficients for quarter and half page ads are insignificant, and with much smaller magnitudes. The coefficients for overlap with one's own paid daily is not significant in column (2) for any of the three ad sizes. The full page ad size is significant in column (5), but not the other two sizes. This statistically significant coefficient in column (5) is also of economic significance. Its magnitude is about 28% of the average advertising rate per

copy circulated for full page ads. We also note that, when these two indicator variables are broken down into sets of three indicators for each of the three ad sizes, these two sets of three coefficients no longer have relative magnitudes proportional to their ad sizes, as we have seen for the circulation variable. In particular, the coefficients for the full page ad is much larger than four times the respective coefficients for the quarter page ad. We believe this suggests that there exists vastly different competitive forces for large full tabloid page ads, versus smaller display ads. We will elaborate of this point shortly. Finally, in columns (3) and (6) of table 4, we include an overlap indicator variable for the Fairfax and NZME titles cited in the Commerce Commission's final decision. These titles are located in towns around the North Island where the two corporate publishers have overlapping free weeklies. If the proposed merger were passed, these towns would experience a fall in the number of free weekly publishers from two to one. Thus, it is possible that these markets represent the most intense competition that the two merging parties would wish to internalize. However, this variable is not significant in either column (3) or (6), and it has a negative sign in column (6) only.

We believe that the results in table 4 reveal a few noteworthy features of the print advertising market, with regard to cross-tier competition and market definition. The overlap indicator variables in column (1) shows that competition for advertisers within the same tier (free weeklies) is stronger than competition across tiers, when the former is still available. We are not rejecting the umbrella model for New Zealand: negative but insignificant price effects do not reject the presence (or prove the absence) of competition between the two tiers, when they are of different ownership. Our results do show that the loss in competition from the disappearance of rival free weeklies would not be wholly replaced by competition across the two tiers, if the latter still exists. In the case of New Zealand, because all (except one) paid daily city newspapers are owned by either one of the corporate publishers, a merger between them would also eliminate most cross-tier competition. Only the independent publishers, which own 25% of the existing free weekly titles, would still experience some within-tier and across-tier competition.

Regarding cross-tier competition, table 4 seems to suggest that, when an overlapping paid daily does exist, there is an asymmetry in competitive forces caused by same versus rival ownership. The "overlap with rival paid daily" variable is never significant anywhere, while the "overlap with own paid daily" variable is significant, for the full page ad size, in column (5). Moreover, the price effects also differ in magnitude. The positive price effect from same ownership is larger than the negative price effect from rival ownership. This implies that, while a free

weekly does not seem to compete for the advertising clients of a rival paid daily, it does seem to set prices jointly with a co-owned paid daily. Column (5) shows that the latter effect is especially significant for clients that purchase full page ads. We believe this asymmetry may be due to the prevalence of multi-title deals in newspaper advertising. It is conceivable that the prices in our dataset, which are rack prices for a single instance, are set deliberately high to incentivize clients towards multi-title packages. These packages are only available when the publisher owns both a free weekly and a paid daily. Bulk advertising packages also strengthens a client's loyalty with one particular publisher, which also explains why geographically isolated free weeklies do not price their rates to compete for clients from another publisher's paid daily. We note that the positive significance occurs only when the dependent variable, advertising rate, is divided by circulation (column (5)), not when it is expressed in raw form (column (2)). This means that the effect from an overlapping paid daily of same ownership is proportional to circulation, as opposed to being a fixed, absolute value. This makes sense because the circulation numbers of paid dailies and free weeklies are often of different orders of magnitude; the same is also true between big and small paid dailies. For example, when a multi-title publisher sets rates for a free weekly with circulation 2,000, the competitive effect from a jointly owned paid daily should not have the same absolute value whether the paid daily has circulation 20,000 or 200,000.

We believe that the different price effects from the different ad sizes have crucial implications for market definition. It suggests two different markets for print advertising—that is *not* demarcated between free weeklies and paid dailies (although this may be the primary distinction perceived by newspaper readers, based on their differentiation in content, format, and frequency). Rather, full page ads in free weeklies are observed to have very different pricing patterns in response to market structure, compared with smaller sized display ads. Their coefficients are statistically significant, in signs that we expect, and disproportionately larger in magnitude, relative to the coefficients for smaller sized ads. We believe this is suggestive that smaller sized display advertising (half tabloid page or smaller) in free weeklies is a market of its own, separate from the market for full page tabloid ads, which is actually in the same market with display advertising in paid daily city newspapers. This is supported by not only our regression results. We observe from actual printed copies that buyers of smaller sized display ads are primarily independent local businesses, while clients of full tabloid page display ads are mostly regional or national businesses with local franchises (such as a supermarket or a hardware store chain). National businesses have access to many alternative advertising outlets (such as paper

flyers, TV, radio, and digital), unlike local businesses, which may explain why overlapping rival free weeklies price their full page ads competitively. The (reduced-form) counterfactual from our regression analysis suggests that if Fairfax and NZME were to merge, there would not be much price effects for smaller sized display ads. However, full page ad rates are likely to increase, from both the loss in competition in the free weekly tier and the new joint ownership across the two tiers. From table 4's columns (2) and (5), either of these effects alone is associated with an increase in price of more than 5%, which is typically used in the SSNIP (small but significant and non-transitory increase in price) test.

We now turn to the results for classified advertising, the column-liner rate, in table 5. In figure 3 they do not show much of a proportional relationship with circulation, unlike display advertising rates. For comparability with previous tables, we keep circulation as an explanatory variable. However, it is often insignificant. By the same reason, we also omit using the classified advertising rate divided by copy circulated as the dependent variable. We consolidate the two sets of regressions into the same table 5: regressions with ownership indicator variables are in columns (1)-(3); regressions with overlap indicator variables are in columns (4)-(5).

Column (1) shows that independent publishers have significantly lower classified rates, common with display advertising. When ownership is broken down into individual publishers in columns (2) and (3), the pattern starts to differ from display advertising. NZME column-liner rates are significantly higher, and Allied Press rates significantly lower, when Fairfax rates are used as a baseline. The closing Fairfax titles have lower rates than others, but the coefficient is not significant. Columns (4) and (5) show that the overlap indicator variables are rarely significant, and often not in the sign that we expect from competition. The lack of statistical significance could be due to the small number of observations: one per newspaper title. Column (4) shows that an overlap with a rival paid daily has a negative and significant price effect. The magnitude of the coefficient is about 30% of the average column-liner rate. The other two overlap variables, with own paid daily and with rival free weekly, do not have significance in either columns. Surprisingly, column (5) shows a positive and significant price effect for the overlapping Fairfax-NZME titles.

Overall, classified advertising rates do not seem to have the same pattern of variation as displayed advertising rates. The empirical evidence seems to suggest that the mode of competition in classified advertising is different from that of display advertising. Firstly, it has a much

Table 5: Regression results: classified column-liner advertising rate on ownership and market structure

dependent variable:	Classified column-liner advertising rate				
	(1)	(2)	(3)	(4)	(5)
circulation	0.00000719	0.0000275***	0.0000267***	0.00000967	0.0000116
	(0.0000109)	(0.00000672)	(0.00000680)	(0.0000111)	(0.0000101)
Ownership indicator variables:					
independent	−1.246**				
	(0.475)				
Fairfax		—	—		
		—	—		
NZME		4.005***	3.909***		
		(0.331)	(0.353)		
Allied Press		−1.296***	−1.389***		
		(0.401)	(0.419)		
Star Media		0.897*	0.808		
		(0.479)	(0.493)		
WSN		1.606**	1.511**		
		(0.710)	(0.721)		
Times Media		0.387	0.294		
		(0.858)	(0.868)		
Wairarapa Times-Age		0.919	0.826		
		(1.201)	(1.209)		
Closing Fairfax titles			−0.293		
			(0.369)		
Overlap indicator variables:					
With rival paid daily				−1.206**	−0.729
				(0.537)	(0.503)
With own paid daily				−0.797	−0.539
				(0.528)	(0.486)
With rival free weekly				0.608	−0.407
				(0.441)	(0.467)
Overlap: Fairfax-NZME free weekly					2.229***
					(0.516)
constant	4.003***	2.359***	2.469***	4.396***	3.986***
	(0.382)	(0.267)	(0.301)	(0.679)	(0.627)
R^2	0.0789	0.692	0.694	0.0701	0.233
N	94	94	94	94	94

* p<0.1, ** p<0.05, *** p<0.01

weaker relationship with, or reliance on, newspaper circulation numbers. Secondly, there is little indication of price competition from geographic overlap, within or across newspaper tiers. We propose that classified advertising is more akin to a business directory. If the intention is less about capturing fleeting eyeballs and more about being present in the background and thus searchable, then the circulation of a newspaper is not of primary concern to the classified advertiser. It is thus not a strong determinant of the classified advertising rate. Price competition between overlapping titles may also be less of a concern if advertisers are more willing to patronize multiple titles, due to classified's smaller expenditures, or if readers using the classified ads consult multiple titles if they know what they are looking for. Together, they suggest that if Fairfax and NZME were to merge, there is unlikely to be much price effects on classified rates from the loss of rival free weeklies, but rates might increase from the loss of competition between the two tiers.

In conclusion, our empirical analysis gives supporting evidence for the Commerce Commission's decision to decline the proposed NZME-Fairfax merger. A significant portion of their final decision concerns the loss in competition in geographic markets where NZME and Fairfax have overlapping free weekly newspapers. Our study shows that this concern is grounded in empirical evidence. In addition, this study provides an additional reason that the merger should be declined—it would render almost all existing paid daily titles to have common ownership with some of its overlapping free weeklies. For example, in the Auckland market, NZME publishes the paid daily city newspaper while Fairfax publishes eleven free weekly suburban titles. The merger would introduce a new joint ownership between these two tiers, and our analysis shows that this is associated with a 28% increase in full tabloid page advertising rate per copy circulated for free weeklies.

Lastly, our analysis sheds light on what might happen to geographic markets where Fairfax closes a suburban weekly title, in the absence of a merger. All else equal, when competition with a rival free weekly disappears, advertising rate is likely to increase. Among the fifteen titles that Fairfax is confirmed to close, four overlap with NZME free weekly titles; five overlap with Allied Press titles; two overlap with Star Media titles; and one overlaps with Wairarapa Times-Age. Only three are local monopolies before closure. Fairfax is likely to divest other suburban titles by selling to incumbent media companies. New Zealand is thus experiencing the same trend of newspaper closures and ownership consolidation as seen in North America. An additional obstacle to newspaper competition in New Zealand is the small number of incumbent media

companies, which greatly diminishes the remedial effect of divestitures.

5.1 Potential endogeneity of readers' choice

So far we have largely ignored the role of readers. We have assumed that all households would read the weekly suburban newspapers, just because they are delivered freely to all residents' mailboxes. Of course, in reality residents are free to put up "no junk mail" (or even specifically "No *North Shore Times*") signs in their mailboxes, or discard the papers immediately upon receiving them. This would hurt the number of eyeballs that print advertisements could reach. Thus, in theory, readership choice, advertisers' purchases, and advertising rates are all endogenous variables, determined simultaneously in a structural model of a two-sided market. The lack of a retail price for these newspapers does not preclude the right of residents to refuse to read them, if they perceive these newspapers to have poor quality or if they find annoyance with advertisements.

While our empirical analysis does not model advertisers' purchase decisions, our hedonic regression on advertising rates does include circulation as an explanatory variable. In a fully structural model of a two-sided market, such as one in Fan (2013), circulation is an endogenous variable that results from residents' reading decision, which in turn is a function of newspaper characteristics. Besides the usual retail or subscription price, readers are typically modelled to derive utility from the quality of newspaper content. This can be measured by variables such as the "newshole" (a term in journalism that refers to the amount of space available for news, after paid advertisements are filled), the number of journalists in the newspaper's employment, or the variety of content covered.

In this subsection we present a robustness check on whether our circulation variable has a statistically significant relationship with newspaper quality, to gauge the extent of active decision-making on the readers' part. We focus on Fairfax's suburban titles, where we have both the official circulation numbers and readership numbers measured by Nielsen. The circulation variable would exclude the number of households with "no junk mail" or "No *North Shore Times*" signs on their mailboxes, while the readership variable would exclude households who discard the papers upon receiving them. We generate a "quality" measurement for all Fairfax suburban titles using the number of news story headlines per issue divided by the total number of pages in that issue, averaged over a number of weeks. There is quite a wide range on the

number of news stories (from 5.6 to 28) and total number of pages (from 12.5 to 71) across different titles. The number of news stories per page averages from 0.22 to 0.62. We regress both circulation and readership on the newspaper quality variable. As table 6 shows, there is no statistical significance anywhere. We take this as reassurance that readers of the free weekly newspapers mostly accept them passively. Thus, we can mostly ignore the readers' side of a theoretically two-sided market.

Table 6: Robustness check: Circulation and readership on newspaper quality

dependent variable:	circulation	readership
quality	26892.4	71628.7
	(28251.3)	(58278.3)
constant	19729.7	20072.1
	(12177.5)	(24957.5)
R^2	0.0182	0.0293
N	51	52

* p<0.1, ** p<0.05, *** p<0.01

6 Conclusion

In this paper we investigate the competition for print newspaper advertising in New Zealand. We focus on free weekly suburban titles, whose revenue comes solely from advertising. Because they are distributed to household mailboxes, we can largely ignore readers' decisions in an otherwise canonical two-sided market. We construct an original dataset of advertising rates, circulation, and market structure variables. From our regression analysis on display advertising rates, we find strong evidence for competition between free weekly suburban titles with overlapping areas of distribution. Specifically, the presence of a rival free weekly in one's geographic market is associated with a 11% decrease in the full tabloid page display advertising rate. We also find evidence of joint profit maximization between co-owned free weeklies and paid dailies, associated with a 28% increase in the full tabloid page display advertising rate per copy circulated. We find some weaker evidence for competition between free weekly suburban newspapers and paid daily city newspapers. Thus, our result shows that the umbrella model of newspaper competition, which emphasizes competition between different tiers, is not always prevalent on the advertising side of the market, despite the presence of multiple newspaper titles. In addition, our result supports the Commerce Commission's recent rejection of the proposed NZME-Fairfax merger,

and sheds light on the potential outcomes in markets where Fairfax is closing titles in the absence of a merger. Lastly, our results from the three different display ad sizes give a crucial implication on market definition. Smaller display ads purchased by local businesses are in a separate market from full tabloid page display ads, purchased by national businesses with local franchises. The latter market is more competitive than the former, likely due to the many other advertising options available to larger businesses. This implies that the market for large display ads is likely to suffer more should the NZME-Fairfax merger be granted.

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