



Paywalls' impact on local news websites' traffic and their civic and business implications

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| Abstract: | <p>In an attempt to manage a looming revenue crisis in their transition from print to digital, many local newspapers have implemented user payment (paywalls) in their online editions. This paper asks what the business and civic implications of such introduction of user payment are. Comparing audience metrics on a sample of eight local news websites (four Norwegian, four Danish) for 52 weeks before and after paywall introduction, this study finds that the numbers of both pageviews and unique visitors decrease upon the transition from free to fee-based access to the news. Hard paywalls have a more negative immediate effect on traffic than soft paywalls. This difference equalizes over time and the traffic mainly remains at a decreased level regardless of paywall type. Traffic development in Norway is somewhat better than in Denmark in a short-term perspective, but national differences also even out over time. We posit that while paywalls may constitute a new revenue stream for local news media under financial pressure, they also challenge the civic function of the local news media since fewer people consult them.</p> |

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In an attempt to manage a looming revenue crisis in their transition from print to digital, many local newspapers have implemented user payment (paywalls) in their online editions. This paper asks what the business and civic implications of such introduction of user payment are. Comparing audience metrics on a sample of eight local news websites (four Norwegian, four Danish) for 52 weeks before and after paywall introduction, this study finds that the numbers of both pageviews and unique visitors decrease upon the transition from free to fee-based access to the news. Hard paywalls have a more negative immediate effect on traffic than soft paywalls. This difference equalizes over time and the traffic mainly remains at a decreased level regardless of paywall type. Traffic development in Norway is somewhat better than in Denmark in a short-term perspective, but national differences also even out over time. We posit that while paywalls may constitute a new revenue stream for local news media under financial pressure, they also challenge the civic function of the local news media since fewer people consult them.

KEYWORDS *audience metrics; local media; online news; paywall*

The economic crisis facing the local newspaper industry threatens local journalism and the important role that local newspapers play as infrastructure for democracy in local communities. With eroding readership and digital display advertising in decline, it is vital for local newspapers to find new revenue streams. Local newspapers' success or failure in finding such revenue streams concerns the future of local journalism and thus the democratic well-being of local communities. One popular strategy is to re-introduce the subscription

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3 model used by printed newspapers and charge readers for access to online content. Such user
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5 payment, known as paywalls in research literature, has put more emphasis on building a loyal
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7 base of online subscribers. This entails a delicate balance between converting non-paying
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9 readers to subscribers, on one hand, and delivering attractive target groups to advertisers in
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11 terms of both size and demographics, on the other. Because of the limited size of natural,
12
13 geographic audience markets, the advertising side of local newspapers' business model is
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15 particularly vulnerable to loss of online traffic. Furthermore, audience decline would mean
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17 that fewer people consult their local newspapers for news which consequently weakens the
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19 democratic role that local newspapers play in local communities. As such, traffic remains an
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21 important performance indicator for local newspapers - both from a business and a civic
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23 perspective.
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29 Despite much investigation over the last ten years, the effect of paywalls remains
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31 unclear, with mixed results reported in the literature. Some studies argue that paywalls may
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33 be working well in reserving online content for paying customers without substantial loss of
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35 traffic (Carson 2015; Olsen and Solvoll 2018b). Other studies find that paywalls are risky
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37 experiments as they decrease traffic (Chiou and Tucker 2013; Dekavalla 2015; Newman and
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39 Levy 2013) and thus the newspapers' attractiveness for advertisers (Ananny and Bighash
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41 2016; Arrese 2016; Chyi and Tenenboim 2017; Kammer, Boeck, Hansen and Hauschildt.
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43 2015; Myllylahti 2016).
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48 The purpose of this paper is to advance our understanding of these mixed findings by
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50 asking how the introduction of paywalls influences audience behaviour in terms of traffic,
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52 and what implications this has for the role of local newspapers in local democracy as well as
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54 for the advertising business of local newspapers. The analysis has thus a double focus that
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56 explores both the societal and business effects of paywalls in a local context.
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PAYWALLS' IMPACT ON LOCAL NEWS WEBSITES' TRAFFIC

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We analyse two manifestations of audience behaviour in response to paywalls: the number of unique visitors and the number of pageviews from desktop and mobile sources. We compare these audience metrics before and after the introduction of paywalls in eight local newspapers (four Danish and four Norwegian) both in a short-term and long-term perspective. Our analysis shows that the number of unique visitors and pageviews of both mobile and desktop versions decreases after the implementation of paywalls. Hard paywalls have a more negative immediate effect on traffic than soft ones, but over time this pattern changes and the traffic mainly remains at a decreased level regardless of paywall type. Traffic development in Norway is somewhat better than in Denmark in a short-term perspective, but this too changes in due course. Measuring traffic development before and after the introduction of paywalls provides important knowledge about the implications of the newspapers' manoeuvre from an advertising-only to a two-legged subscription and advertising-based business model. The study demonstrates that the important civic role of local newspapers is changed and possibly threatened as both mobile and desktop usage of local online news sites decreases.

The Scandinavian case

The two Scandinavian case markets epitomize the democratic-corporatist (Hallin and Mancini 2004) or Nordic media system (Brüggemann, Ebgesserm Büchel, Humprecht and Castro 2014) characterized by the co-existence of a high level of state intervention and free market forces, institutionalized editorial freedom in the form of the "arm's-length principle", and the early development of journalistic professionalism (see also Syvertsen, Enli, Mjøs and Moe 2014). However, despite media-systemic, social and cultural similarities, the two countries differ in several regards: Norway is a more decentralized country with smaller, scattered municipalities and more than 200 newspapers, compared to 30 in Denmark. Local

1
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3 news media assume a more prominent and important position in Norway, and Norwegian
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5 media policy reflects this prominence of local news media in its specific subsidy framework
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7 for local newspapers (Ohlsson 2015).
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10 Both Norway and Denmark have high internet penetration, and in both countries more
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12 than two thirds of the population use smartphones to access news (Newman, Fletcher,
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14 Kalogeropoulos, Levy and Nielsen 2018). Paywalls were broadly introduced in 2011
15
16 (Norway) and 2012 (Denmark) and today almost all news websites of legacy media have
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18 paywalls (Hjarvard and Kammer 2015; Høst 2017). Willingness to pay for online news is
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20 higher in Norway than in Denmark (Newman et al. 2018).
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26 **Literature review**

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28 Different perspectives on the institutional role of local newspapers offer different
29
30 points of departure for analysing audience behaviour after the introduction of paywalls. On
31
32 one hand, local newspapers are civic institutions serving the public interests of local
33
34 communities. On the other hand, they are business entities motivated by market forces. The
35
36 civic perspective perceives the media as serving audiences as citizens; that is, as reflexive
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38 members of a democratic society (Schrøder 2012). This media-society nexus is related to
39
40 both civil, political, social, and cultural dimensions of citizenship (Dahlgren 2000). The
41
42 business perspective sees audiences both as customers who buy media products and as
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44 products which can be marketed and sold to advertisers (e.g Napoli 2016). Even though the
45
46 polarization of the civic and business perspectives on audiences has been extensively
47
48 discussed and criticized in the literature (e.g., Mellado and van Dalen 2017; Underwood
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50 2001), we maintain that the distinction remains relevant for the discussion of the institutional
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52 role of newspapers.
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PAYWALLS' IMPACT ON LOCAL NEWS WEBSITES' TRAFFIC

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A civic perspective on local newspapers and audiences as citizens

Despite their imperfections, there is ample empirical evidence of the importance of local newspapers for local communities and their citizens (Nielsen 2015). Three social and cultural roles are salient in the literature: local newspapers as sources of information about local news and politics, as mediators of culture and identity, and as arenas for public debate (e.g., Hess and Waller 2017; Skogerbø and Winsvold 2011).

With regard to information, local newspapers play an important role in communicating information and providing critique concerning the ways in which local authority service-provision works and how political responsibilities are fulfilled (Ekström, Johansson and Larsson 2006) and serve as local politicians' main channels of communication with the public (Engan 2015; Firmstone and Coleman 2015). Providing the local community with information generates positive externalities, as well-informed citizens will make more informed decisions for the benefit of themselves and society as a whole (Van der Wurff 2012). Research has identified persistent knowledge gaps between regular news users and non-users which tend to reinforce pre-existing differences between relatively privileged and less privileged citizens (Nielsen 2015). A long tradition of research has demonstrated that the connection between local media and local communities is significant (Ibid). Local news media offer people a sense of place in the boundlessness and openness of the wider world (Hess and Waller 2017), they contribute to belongingness to the *Heimat* of the audience (Skogerbø and Winsvold 2011), and they help create "communicatively integrated communities" (Friedland 2001). According to research by Kim and Ball-Rokeach (2006), local media connectedness increases both information levels, a sense of community belonging, and civic and political engagement.

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3 *A business perspective on local newspapers and audiences as customers and products*
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5 The purpose of newspapers as business operations is to create, deliver and capture
6 value. These ambitions are expressed in the firm's business model (e.g., Amit and Massa
7 2011; Olsen and Solvoll 2018a). Newspapers' business model has traditionally been based on
8 a dual market-place logic whereby content is sold to audiences, audience attention to
9 advertisers, and where a positive feedback loop exists so that large audiences enable higher
10 advertisement rates, which in turn underwrites content production that allows higher fees
11 from audiences (Blanchett Neheli 2018; Goyanes 2015; Picard 2011). This positions
12 audiences as customers in one market and products in the other (Napoli 2016).
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24 When newspapers moved online, advertising became the primary source of revenue
25 and content was offered for free to attract massive readerships (Arrese 2016). However,
26 advertising revenue has proved less than adequate in compensating for the expenses incurred
27 in online content creation and distribution (Dutta 2012) and unable to compensate for loss of
28 print advertising despite substantial audience growth (Leurdijk 2013). The scarcity of
29 distribution channels and access to local and regional populations which enabled local print
30 newspapers to offer exclusive value to advertiser in the pre-internet era was replaced with
31 abundance on the internet where local newspapers face fierce competition from local,
32 national and global players (Van der Wurff 2012). Consequently, in its most basic form,
33 online advertising has become a "numbers game", where maximizing audience figures has
34 been the main focus (Grueskin, Seave and Graves 2011). According to this logic, any
35 reduction in audience reach would be detrimental to local newspapers' revenues. However,
36 not only exposure but also audience demographics and engagement affect their value as a
37 product (Napoli 2016). A smaller more engaged audience may be more valuable for
38 advertisers and thus generate more revenue for media organisations than a large, fleeting one
39 (Leurdijk 2013; Olsen and Solvoll 2018b).
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Newspaper paywalls and their implications

A paywall is a mechanism that restricts access to (some of) the content of a news website to paying users. In this way, paywalls limit public access to all or to some digital news content, if no fee is paid (Myllylahti 2016). A hard paywall allows access to content only via subscription, whereas the metered model provides access to a certain number of free articles before charging. A third option, the soft, freemium, model, charges for premium content and keeps other sections open for free use (Ibid; Hjarvard and Kammer 2015).

After more than a decade in pursuit of developing sustainable online revenues on the basis of advertising almost exclusively, newspaper publishers started to experiment with user payment, particularly after the financial crisis in 2008 (Arrese 2016). From the early days of paywalls in online newspapers, the principal motivation for implementing them has been to generate new revenue from users in order to protect print circulation and to harvest user data (Herbert and Thurman 2007). The trade-off effect that paywalls may have on advertising because of traffic decline is an acknowledged risk when implementing user payment and publishers are searching for a “sweet spot” between user payment and maximized traffic (Carson 2015; Dekavalla 2015).

Results from research on the impact of paywalls and different paywall types on audience reach are inconclusive. Some studies find that unwillingness to pay drives digital users away (Chyi and Tenenboim 2017; Kammer et al. 2015; Olsen and Solvoll 2018a), particularly the younger generation (Chiou and Tucker 2013) and most dramatically so with hard paywalls (Dekavalla 2015; Newman and Levy 2013). In contrast to this, a study by Carson (2015) of masthead dailies in the US, Britain, and Australia concluded that there is no simple argument that a paywall will limit audience reach, and Olsen and Solvoll (2018b)

1
2
3 found local newspaper managers in Norway to be optimistic about the effect of paywalls in
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5 regard to reach.
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8 Some scholars are concerned that paywalls will affect newspapers' civic role
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10 negatively, which brings to play a citizen perspective on audiences. In their view, paywalls
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12 may lead to a less informed citizenry and increase information gaps between different user
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14 segments (e.g. Ananny and Bighash 2016; Collins 2011; Myllylahti 2014 and Pickard and
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16 Williams 2014). Such inequalities are arguably amplified as newspapers tend to paywall their
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18 most valuable content (Kvalheim 2013; Myllylahti 2017; Olsen and Solvoll 2018b; Sjøvaag
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20 2016). Other contributors to the debate assess the business dimension of paywalls and
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22 conclude on a pessimistic note: Myllylahti (2016), for example, describes how publishers
23
24 have found the paywalls ineffective in building audience and advertising revenues. A general
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26 concern is that monetizing online news could reduce online traffic and decrease reach – and
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28 thereby the newspapers' associated advertising revenue (Ananny and Bighash 2016; Athey,
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30 Calvano and Gans 2018; Carson 2015; Chyi and Tenenbom 2017; Dekavalla 2015; Pickard
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32 and Williams 2014).
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38 As described by Grueskin, Seave, and Graves (2011), online traffic has both a breadth
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40 and a depth dimension regarding the number of readers and their engagement with a news
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42 site, respectively. When summing up the ambiguous findings on the effect of paywalls on
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44 traffic and their implications for the civic and business roles of local newspapers, both
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46 dimensions are relevant. A decrease in audience breadth could mean that fewer people benefit
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48 from the information, integration and arena function of local newspapers, and that
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50 newspapers have a smaller audience product to offer their advertising customers. However, if
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52 the lost traffic consists mainly of the least engaged audience, local newspapers may
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54 experience improved depth of consumption due to their paywalls, with each visitor paying
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more attention to the newspaper's content. Such increase in the depth of the traffic could be valuable both from a civic and business perspective.

Research question and hypotheses

As demonstrated by the literature review, previous research into the traffic development of newspapers with paywalls yields somewhat ambiguous results. It is unclear if paywalls affect the breadth and depth dimension of online traffic differently and what role temporality plays for traffic development on news sites with paywalls. To explore this, the present study asks how the number of pageviews and unique visitors develops after the introduction of paywalls in Norwegian and Danish local news sites in a short term vs. long term perspective (RQ1). With regard to type of paywalls, we expect that hard paywalls will have more negative impact on traffic than soft paywalls (H1), as some studies suggest (Dekavalla 2015; Newman and Levy 2013). Moreover, we expect that paywalls in Danish news sites will have a more negative impact on traffic than paywalls in Norwegian news sites, (H2) as there is some empirical evidence of higher willingness to pay for news in Norway (Newman et al. 2018).

Methodology

To explore these hypotheses and research question we compare audience traffic on a sample of local news websites from before and after the introduction of paywalls. This measurement is based on passive registration of use by means of cookies on the webpages under study and provides census data rather than sample data from a web panel.

Data

The empirical data consist of audited traffic measurement of local news websites. The metrics we analyse are weekly, average daily *pageviews* and *unique visitors* on desktop and - where available - on mobile platforms. We define pageviews as the volume of “pages” accessed on a publisher’s website, thus referring to “Any time a user views a page by any method, such as clicking on a link, typing in a URL, or refreshing a page” (Cherubini and Nielsen 2016: 34).

Unique visitors refers to the number of browsers that have visited a site over a period of time. Even though a browser is not an individual per se, we interpret it as a proxy for the individual reader in line with the definition of Koning and Pischke (2015). This allows for making inferences about the breadth and depth of the use of the news websites (von Krogh and Andersson 2016). In our case markets, these data are publicly available from national audit organizations, respectively ComScore/Mediebedriftene (for Norway¹) and Danske Medier Research/Gemius and Kantar Gallup (for Denmark²). There is some skepticism in the research literature regarding the reliability and validity of such audience metrics collected for commercial purposes, but as argued by Taneja (2016) these measurements offer opportunities of deciphering media use patterns in theoretically productive ways. Despite growing interest in other audience metrics, such as time spent and levels of engagement, pageviews as well as unique visitors remain relevant as performance indicators both from an advertising perspective and a newsroom practice perspective (Blanchett Neheli 2018). Within newsrooms, these metrics are often used as simplistic measures of reach (Ibid; Cherubini and Nielsen 2016), substantively affecting decisions about news selection, news placement and more predictable audience attention for commercial purposes (Arenberg and Lowrey 2019). However, there are also some potential weaknesses with traffic measurements, such as operationalization of metrics, which may vary across different measurement systems (Zamith

2018), e.g., manipulation of measurements (web robots “visiting” websites in order to artificially raise the number of visitors) and precision of measurement (clicking on a page does not necessarily mean that the user has viewed all information on that page) (de Vreese & Neijens, 2016). The latter is a particularly relevant limitation for our study and should not be ignored in the interpretation of findings.

To be able to track and compare the development longitudinally, we collected data from the 52 weeks before and the 52 weeks after the introduction of the paywall, leaving out the week of the introduction, because the uneven mix of paywalled and non-paywalled days and potential technical challenges involved in rolling out the paywalls could pollute these data points (see Figure 1). This way, the data set consists of 104 measures of the two metrics for each of the eight news websites on both desktop and, where available, mobile platforms (2,668 data points in total; 36 data points were missing from the public audits).

[Figure 1 near here]

Sample

As we wanted to be able to compare developments across a small number of cases selected from a limited universe, we used *quota sampling* to ensure similarities in the external factors of the news websites and their paywalls (Onwuegbuzie and Leech 2007). So, we constructed our sample such that it 1) included an equal number of local news websites from both countries, 2) had an equal distribution of hard and soft paywalls in both countries, and 3) included early as well as late adopters of paywalls (relative to the national markets; see, e.g., Hjarvard and Kammer 2015; Høst 2017). On the basis of these selection criteria, our sample consists of eight local news websites - four Norwegian and four Danish (see Table 1). For three of the cases, only desktop data was available; for the other five, both desktop and

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3 mobile data were analysed. While the sample cannot claim to be representative (in part
4 because the specificities of each local news website in and beyond our sample are unique), it
5 does embrace the diversity of paywalled local news websites in both national markets, for
6 instance regarding type of paywall, market size, and time of paywall introduction.
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14 [Table 1 near here]
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17 18 19 *Analysis*

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21 Because of “natural variations” in use as well as news agenda (seasons, holidays, big
22 events, breaking news, etc.), there will always be fluctuations in the number of pageviews
23 and unique visitors from day to day and week to week. To determine whether audience traffic
24 increased or decreased beyond the “natural variation” from one point in time to another, we
25 conducted a two-tailed paired sample t-test on the weekly audience traffic as we wanted to
26 compare the traffic of the same web page (desktop and mobile) at different points in time. In
27 the instances where mean comparisons of the fluctuations returned results with p -values
28 below .05, we rejected the null hypothesis and considered results significant in terms of
29 decrease or increase. The statistical procedure does not take into account (i.e., autocorrelate
30 for) underlying trends in the general development in audiences’ use of local news websites.
31 To even out weekly fluctuations but remain sensitive to changes and seasonal variation, and
32 to make possible comparisons across longer stretches of time, we grouped the 104 weeks of
33 data into “quarters” of 13 weeks each. This way, we created four quarters before and four
34 quarters after the introduction of the paywalls (Figure 1).
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53 The significance test offers three mutually exclusive outcomes with regard to traffic
54 development: it can decrease significantly (which is the most likely scenario, cf. above), it
55 can increase significantly, or there can be a non-significant fluctuation. These three
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possibilities apply to the numbers of both pageviews and unique visitors, creating a matrix of nine possible scenarios upon the introduction of a paywall (presented in Table 2). We use this matrix for mapping developments in audience behavior on the eight local news websites in the sample over time, identifying patterns relating to how local audiences react to the shift from free to fee-based access to the news.

[Table 2 near here]

Results

The overall finding of this study is that the introduction of a paywall does not influence positively on either the number of pageviews or the number of unique visitors. On the contrary, most news websites experience significant decreases across desktop and (to a lesser degree) mobile usage. These findings apply to both the immediate consequences of the introductions and to the longer-term comparisons of performance.

For six of the eight news websites in the sample the immediate effect of the introduction of a paywall was one of decreased performance either for mobile, desktop or both editions. The immediate effect is measured as a comparison between the quarters right before and right after the paywall introduction (i.e., Q4 and Q5 as shown in Figure 1). As Table 3 illustrates (see the Appendices for the underlying data), the numbers of both pageviews and unique visitors decreased significantly on three desktop versions and two mobile versions. For five desktop and two mobile versions there was no significant development in negative or positive directions for one or both audience measurements. *Nordjyske* (DK) stands out with a significant increase in page views for mobile usage.

[Table 3 near here]

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6 In addition to checking for immediate developments in audience traffic, the study
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8 looks into the longer-term effects. A decrease in audiences right after a shift from free to fee-
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10 based access to the news is perhaps what could be expected due to the change of value
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12 proposition to audiences (Myllylahti 2014; Olsen and Solvoll 2018b), but the question is how
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14 they develop as audiences get more accustomed to the paywalls. To gauge such longer-term
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16 developments while taking into account seasonal variations, we compare the quarter
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18 immediately before the introduction of the paywall (Q4) with the quarter one year later (Q8).
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20 Such a one-year span is a relatively short one, but it does allow for keeping the data "clean"
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22 of changes in the type of paywalls that the news websites use (e.g., *Aarhus Stiftstidende*
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24 switched from a hard to soft paywall in January 2014, approximately 14 months after the
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26 original introduction).
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31 The result of this longer-term analysis, presented in Table 4, is a pattern similar to the
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33 one presented above, only this time all desktop versions of the news websites but two
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35 experienced significant decreases in both pageviews and unique visitors. The long-term
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37 development for mobile traffic was more divergent: In one case there was a significant
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39 increase in both pageviews and unique visitors (*Nordjydske*); another had a significant
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41 decrease on both measures (*Nordlys*); one had a significant increase in pageviews
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43 (*Fædrelandsvennen*), while another experienced a significant decrease (*Moss Avis*). For the
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45 remaining mobile site in our sample (*Herning Folkeblad*) we were unable to decide the
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47 direction of the development as the results were not significant. In sum, the analysis suggests
48
49 no to little positive longer-term effects of the introduction of paywalls.
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56 [Table 4 near here]
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4 It is not good news for the news organizations that fewer users consult their news
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6 websites, but increased usage by the individual users may compensate for that decrease since
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8 they will then likely be more loyal and valuable customers.
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11 The analysis of pageviews per unique visitor, reported in Table 5, shows that three
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13 news sites experienced a significant improvement of this ratio for their desktop editions
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15 (*Fædrelandsvennen*, *Hallingdølen* and *Moss Avis*) whereas three had a significant negative
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17 development (*Herning Folkeblad*, *Viborg Stifts Folkeblad* and *Aarhus Stiftstidende*) For the
18
19 longer-term development (Q4-Q8), results point to a general improvement of performance
20
21 compared to the immediate impact of paywall introduction, but findings are somewhat
22
23 divergent. There are more instances of significant increases in the pageview/unique visitor
24
25 ratio and fewer cases with significant decrease on this measure. However, there are also cases
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27 with little or no improvement, such as *Herning Folkeblad* (desktop).
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33 [Table 5 near here]
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38 *Types of paywalls* 39

40 Because of the different configurations of audience access and value propositions, one
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42 might expect audiences to respond differently to the introduction of hard and soft paywalls
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44 (Myllylahti 2014; Olsen and Solvoll 2018b). In the immediate aftermath of the introduction
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46 of paywalls, our study shows that only one of the news websites with a soft paywall had a
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48 decrease in both pageviews and unique visitors. All but one of the news sites with a hard
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50 paywall had a similar development. As for the longer-term effect, both soft-paywalled and
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52 hard-paywalled news websites experienced significantly decreased numbers of pageviews
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54 and unique visitors. So, in the long perspectives, the developments in pageviews and unique
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56 visitors appear to be connected to the very introduction of a paywall in itself, not the strategic
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3 choice of which type of paywall to implement. In this way, findings only support H1 (that the
4 decrease in pageviews and unique visitors will be bigger with hard paywalls than soft
5 paywalls) in a short-term perspective. In a longer time perspective, H1 is not supported.
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10 11 12 *National differences* 13

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15 The analysis shows that in the short run the Norwegian news websites perform
16 somewhat better than the Danish ones upon the introduction of paywalls. The analysis of the
17 immediate developments (Table 3) illustrates how three of the Danish news websites
18 experience a significant decrease in page views and unique visitors while the same is true for
19 one of the Norwegian ones. However, just as the case was with regard to the comparison
20 between different types of news websites, the pattern changes over time. From Q4 to Q8,
21 there were more Norwegian than Danish news websites experiencing a significant decrease in
22 both pageviews and unique visitors.
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33 The analysis of the ratio between pageviews and unique visitors also reveals national
34 differences: in both the short and the longer term, a number of Norwegian news websites
35 manage to significantly increase the number of pageviews per unique visitor while the Danish
36 ones decrease (though mainly in the short term). It should be noted that the ratio decrease for
37 the Danish news websites in most cases is non-significant in the longer term. The analysis of
38 the ratio between pageviews and unique visitors also highlights that users of the Danish news
39 websites in the sample on average consult more pages than those of the Norwegian ones.
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49 In this way the analysis cannot unequivocally confirm H2 (that there will be a more
50 negative impact on audience measures in Denmark than in Norway upon paywall
51 introduction). This is only confirmed in a short-term perspective, whereas the findings for the
52 longer time development do not support H2.
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Discussion and conclusion

The introduction of paywalls represents a major shift in local newspapers' online business models. The findings of this study demonstrate how this shift has impacted audience behaviour. Contrary to previous research by Carson (2015) and Olsen and Solvoll (2018b), which suggest that paywalls will not necessarily limit audience reach, our findings reveal a general decrease in both pageviews and unique visitors. As such, this study extends findings by Ananny and Bighash (2016), Chiou and Tucker (2013), Dekavalla (2015), and Newman and Levy (2013) to a larger sample of local newspapers and other markets. With only one exception, we found that not only desktop, but also mobile traffic decreased significantly after the introduction of paywalls. It should be noted that, for several of the news websites, the developments were non-significant. With the major shift from desktop to mobile consumption going on at the time of the data selection, this suggests that paywalls impeded local newspapers' digital transition.

Furthermore, our research reveals how the temporal perspective is crucial for understanding the effect of paywalls on audience behaviour. While at least some of our newspapers did not experience a significant decrease in pageviews and/or unique visitors as an immediate effect of paywalls, the majority had a negative pageview and unique visitor development over a longer time perspective. This suggests that industry optimism regarding the effect of paywalls identified in studies by Dekavalla (2015) and Olsen and Solvoll (2018b) may have been somewhat premature and failed to capture the deeper structural implications of charging for access to online content, at least in terms of audience reach.

Rather surprisingly, our results show that the type of paywall - soft versus hard - did not matter much on traffic development in the long run. In contrast to findings by Dekavalla (2015) and Newman and Levy (2013), our study demonstrates that soft paywalls did not have a particularly positive effect on either pageviews or unique visitors compared to hard

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3 paywalls. This has important implications for the ongoing discussion among industry
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5 representatives regarding the “sweet spot” of paywalling content: how much content should
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7 be restricted by user payment and how much should be left open for free consumption in
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9 order to maximize subscriptions as well as protect reach? Our findings from analysis of both
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11 hard and soft paywalls suggest that these concerns may be exaggerated, as paywalls -
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13 regardless of type - will likely affect both breadth and depth of traffic negatively in the long
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15 run. In addition, the inconclusive results regarding national differences are surprising since
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17 earlier research has identified considerable differences between the overall willingness to pay
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19 for online news in Norway and Denmark (Newman et al. 2018). Our results point to the
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21 importance of the time perspective, as national differences may change over time.
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26 By exploring audience behaviour in terms of both pageviews and unique visitors, our
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28 research adds another dimension to previous paywall studies. The decrease in unique visitors
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30 and pageviews demonstrates that the breadth of local newspaper audiences as well as the
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32 depth of local news consumption was restricted by the implementation of online user
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34 payment. Previous research has indicated that the biggest audience losses were likely to come
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36 from within the group of “fly-by” and light users (Olsen and Solvoll, 2018b), but our results
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38 provide an inconclusive answer to such a hypothesis: on the one hand, the main trend among
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40 Norwegian news websites was increases in the number of pageviews per unique visitor,
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42 suggesting fewer “fly-by” users and increased use by remaining audiences. On the other
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44 hand, the Danish news websites mainly experienced decreases in the number of pageviews
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46 per unique visitor, suggesting that the audiences in general were less active.
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51 Returning to the business perspective on the institutional role of local newspapers and
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53 the advertising side of the double market business model, the present study demonstrates how
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55 paywalls motivate a major shift in the newspaper industry’s online advertising operation with
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57 more emphasis on audience demographics and engagement overreach. Digital marketing has
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3 redefined customer segmentation, targeting and positioning, making way for personalized
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5 advertising. For local online newspapers this suggests that what has been lost in terms of
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7 reach may be compensated by the composition of the remaining audience. If this audience is
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9 more loyal, local, and engaged than the audience lost, they may in fact be more valuable for
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11 advertisers (Olsen and Solvoll 2018b). However, the depth of consumption suggests that local
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13 newspapers still have a way to go to improve audience engagement with their online news
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15 content. To create value for the advertiser, newspapers are challenged to improve the depth of
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17 online news consumption. They need to demonstrate that those audiences that did not flee the
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19 newspaper as a result of the paywall are, indeed, more dedicated and valuable for advertisers.
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21 Although our findings are not all significant, we identify a tendency towards improved
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23 performance with an increased pageview/unique visitor ratio among the Norwegian news
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25 websites but not among the Danish ones. If local newspapers are unable to deliver such value
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27 to advertisers, our findings strongly suggest that the paywall has a negative impact on the
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29 newspaper's advertising business and puts additional strain on media operations that are
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31 already under severe competitive pressure in the digital advertising market.
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38 As Goyanes (2015) argues, the problem for online newspapers is not that the size of
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40 the local digital advertising market is small, but that online newspapers are tiny players in a
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42 market dominated by international technology companies such as Google and Facebook.
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44 Despite optimism regarding marketing opportunities based on audience data, local
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46 newspapers may be too small to offer substantial target groups. And for newspaper
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48 advertising to be profitable in an age where these actors provide much of the infrastructure
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50 for programmatic advertising, the audience must be of a certain scale to reach the "critical
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52 mass" necessary for sustainability (Busch 2016). This would potentially leave news
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54 organisations with few options for the way forward. One alternative is to drop the paywalls in
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56 order to regain their momentum in developing their online audience (Ananny and Bighash
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3 2016). Another is to shift their focus from balancing advertising and user payment towards a
4 more user-payment oriented business model. Industry reports from the case markets indicate
5 that the latter option is the chosen strategy. However, advertising has traditionally played a
6 key role in funding journalism (Picard, 2011) and it is questionable whether local newspapers
7 can sustain their news production without such a subsidy. We argue that the increased
8 emphasis on generating reader revenue online may create new problems for local
9 newspapers' business models and thus threaten the future of local journalism.
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19 Another cause for concern is the declining depth and breadth of the audience
20 demonstrated in the present study and its implications for local newspapers' civic role. The
21 decrease challenges the information role of local online newspapers. As such, the study
22 provides empirical support for concerns voiced by scholars like Ananny and Bighash (2016),
23 Myllylahti (2014), and Pickard and Williams (2014). When less news content is consulted,
24 and fewer individuals encounter the news, the information function of local news media is
25 weakened. Our findings support warnings in previous research regarding widening
26 knowledge gaps between audience groups with financial and technological means to access
27 high-quality news and other audience groups left with lower quality, less substantive free
28 news (Ananny and Bighash 2016; Olsen and Solvoll 2018b; Pickard and Williams 2014).
29 Adding insult to injury, earlier research has shown how local news websites place their best
30 journalism behind paywalls (Kvalheim 2013; Sjøvaag 2016; Myllylahti 2017; Olsen and
31 Solvoll 2018a;) and thereby exclude users who can only access free content from enjoying
32 the full informational value of the local medium. Thus, local online newspapers will only
33 partly undertake their function of facilitating public integration and participation in the local
34 communities. With regard to the arena function, we question whether online local newspapers
35 can hold a central position in the discussion of local issues with the access constraints that
36 paywalls represent. To uphold its civic functions, news providers need to continue facilitating
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4 and constituting public spheres by developing an active and engaged citizenry. From a
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6 normative perspective, we posit that our findings point to profound threats regarding this role
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8 of local newspapers. This begs the question of whether the negative side effects of paywall
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10 can be amended by media policy measures in line with the traditional belief of state
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12 intervention for social, cultural, and political purposes in Nordic media systems (Kammer
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14 2016) and how such measures could be designed. Based on our findings, we argue that
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16 paywalls are not merely a media business matter, but more profoundly a matter of local
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18 democracy that requires attention from media politicians and scholars as well as media
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20 practitioners. As argued by Syvertsen et al. (2014) and Ots and colleagues (2016), there has
21
22 been a general shift from cultural and political values towards economic and technological
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24 arguments in the policy discourse. As such, a growing understanding of the consequences of
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26 local newspapers' attempt to build a business model based on digital user payment is
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28 necessary in order to provide important insights for the discussion of a governmental support
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30 mechanism to aid local newspapers in their business transition from print to digital and -
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32 perhaps more importantly - to stimulate the use of local journalism among citizens in a
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34 paywalled local media environment. It is outside the scope of this study to suggest such
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36 measures. However, to the extent that audience breadth and depth are considered important
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38 for local democracies, the developments described here give reason for some concern and
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40 future research is strongly encouraged to address paywall consequences with a media policy
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42 specific outlook. We urge both scholars, industry representatives, and policy makers to
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44 investigate how the positive externalities of local news consumption can be stimulated and
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46 sustained in a paywall context. We also call on future research to study audience behaviour
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48 on local news sites in more detail, particularly patterns of more superficial consumption like
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50 monitoring, scanning, and snacking of local news. To better understand reader behaviour in
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52 greater detail than this study allows for, we welcome rigorous studies that take into account a
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3 variety of metrics of reading depth (e.g., bounce rate, scroll depth, time spent on site, and
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5 frequency of visits).
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8 In this study, we propose a methodology for exploring empirically the consequences
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10 of the introduction of soft and hard paywalls; our study, however, covers neither the metered
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12 model nor countries outside Scandinavia. To overcome that limitation and enrich scholarly
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14 research into current transformations of the news industry, we invite researchers to expand
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16 our approach to other media systems and user payment models and to extend even further the
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18 temporal perspective applied in the current study to allow for further comparison. For the
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20 local news-media to be sustainable and thereby continue to contribute to the civic and
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22 democratic vitality of local communities, more comparative in-depth research can offer a
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24 helping hand.
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NOTES

¹ Data available through

http://www.tnslistene.no/?list_id=1&week=52&year=2017&report=day&metric=historic. References

² Data available through <https://fdim.dk/statistik/> and <https://danskonlineindex.dk/>.

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For Peer Review Only

APPENDICES

Appendix A. Short-term impact of paywall introduction on pageviews and unique visitors (Q4-Q5); illustrated in Table 3.

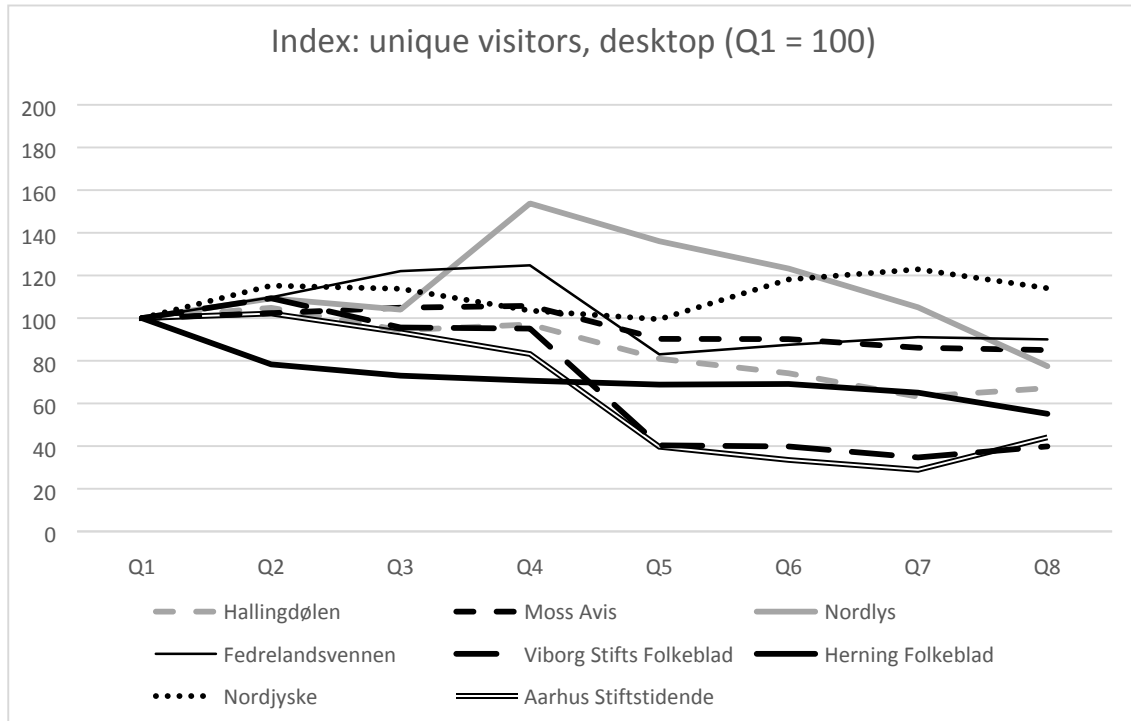
| News website | Q4 | | Q5 | | Difference (Q4-Q5; %) | |
|------------------------------------|-----------|-----------------|-----------|-----------------|-----------------------|-----------------|
| | Pageviews | Unique visitors | Pageviews | Unique visitors | Pageviews | Unique visitors |
| <i>Fædrelandsvennen (d)</i> | 333 627 | 65 547 | 238 443 | 43 620 | -28.5* | -33.5* |
| <i>Fædrelandsvennen (m)</i> | 63 957 | 15 516 | 41 928 | 10 081 | -34.4* | -35.0* |
| <i>Hallingdølen (d)</i> | 16 090 | 4 779 | 15 798 | 3 989 | -1.8 | -16.5* |
| <i>Moss Avis (d)</i> | 78 258 | 14 404 | 78 341 | 12 295 | 0.1 | -14.6* |
| <i>Moss Avis (m)</i> | 33 883 | 9 485 | 33 352 | 9 112 | -1.6 | -3.9 |
| <i>Nordlys (d)</i> | 345 375 | 93 966 | 327 057 | 83 142 | -5.3 | -11.5 |
| <i>Nordlys (m)</i> | 200 380 | 98 681 | 200 220 | 95 959 | -0.1 | -2.8 |
| <i>Herning Folkeblad (d)</i> | 205 828 | 17 730 | 169 477 | 17 266 | -17.7* | -2.6 |
| <i>Herning Folkeblad (m)</i> | 89 445 | 15 033 | 69 295 | 11 543 | -22.5* | -23.2* |
| <i>Nordjyske (d)</i> | 1 205 249 | 97 415 | 1 082 577 | 93 600 | -10.2 | -3.9 |
| <i>Nordjyske (m)</i> | 745 390 | 110 009 | 899 709 | 120 181 | 20.7* | 9.2 |
| <i>Viborg Stifts Folkeblad (d)</i> | 211 314 | 11 291 | 50 645 | 4 791 | -76.0* | -57.6* |
| <i>Aarhus Stiftstidende (d)</i> | 1 266 307 | 33 741 | 215 224 | 16 099 | -83.0* | -52.3* |

NOTE. * $p < .05$. *d*=desktop, *m*=mobile. Percentage change (%) in average daily number of pageviews and unique visitors.

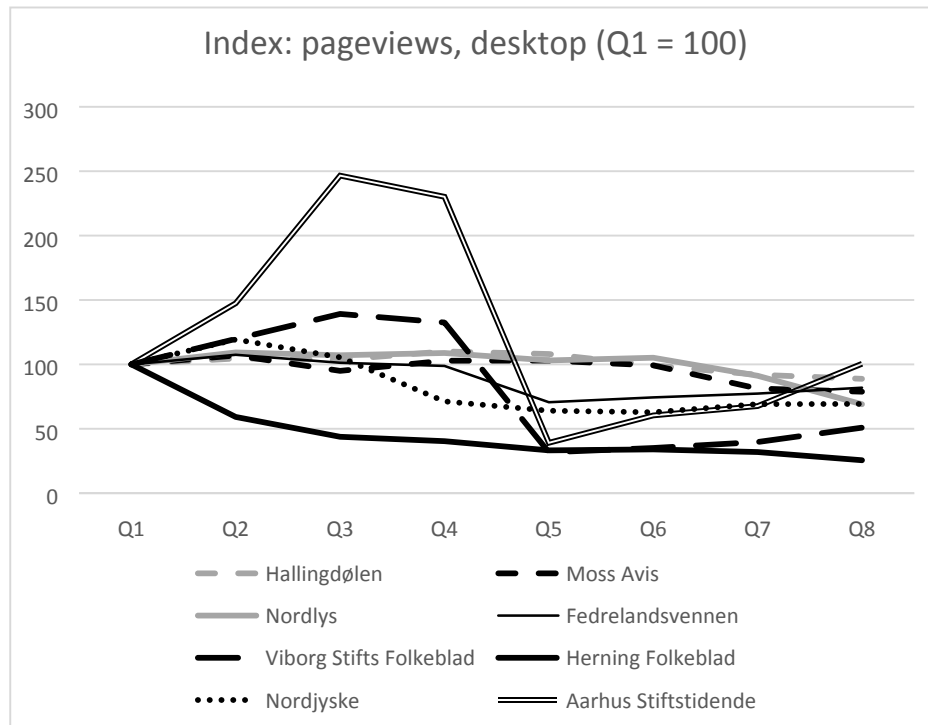
Appendix B. Long-term impact of paywall introduction on pageviews and unique visitors (Q4-Q8); illustrated in Table 4.

| News website | Q4 | | Q8 | | Difference (Q4-Q8; %) | |
|------------------------------------|-----------|-----------------|-----------|-----------------|-----------------------|-----------------|
| | Pageviews | Unique visitors | Pageviews | Unique visitors | Pageviews | Unique visitors |
| <i>Fædrelandsvennen (d)</i> | 333 627 | 65 547 | 276 592 | 47 302 | -17.1* | -27,8* |
| <i>Fædrelandsvennen (m)</i> | 63 957 | 15 516 | 79 605 | 15 848 | 24.5* | 2,1 |
| <i>Hallingdølen (d)</i> | 16 090 | 4 779 | 12 983 | 3 309 | -19.3* | -30,8* |
| <i>Moss Avis (d)</i> | 78 258 | 14 404 | 59 967 | 11 580 | -23.4* | -19,6* |
| <i>Moss Avis (m)</i> | 33 883 | 9 485 | 30 741 | 8 623 | -9.3* | -9,1 |
| <i>Nordlys (d)</i> | 345 375 | 93 966 | 219 126 | 47 341 | -36.6* | -49,6* |
| <i>Nordlys (m)</i> | 200 380 | 98 681 | 131 172 | 44 599 | -34.5* | -54.8* |
| <i>Herning Folkeblad (d)</i> | 205 828 | 17 730 | 130 363 | 13 834 | -36.7* | -22.0* |
| <i>Herning Folkeblad (m)</i> | 89 445 | 15 033 | 79 433 | 12 355 | -11.2 | -17.8 |
| <i>Nordjyske (d)</i> | 1 205 249 | 97 415 | 1 171 979 | 107 292 | -2.8 | 10.1* |
| <i>Nordjyske (m)</i> | 745 390 | 110 009 | 1 149 255 | 125 982 | 54.2* | 14.5* |
| <i>Viborg Stifts Folkeblad (d)</i> | 211 314 | 11 291 | 81 126 | 4 732 | -61.6* | -58.1* |
| <i>Aarhus Stiftstidende (d)</i> | 1 266 307 | 33 741 | 552 799 | 17 890 | -56.3 | -47.0* |

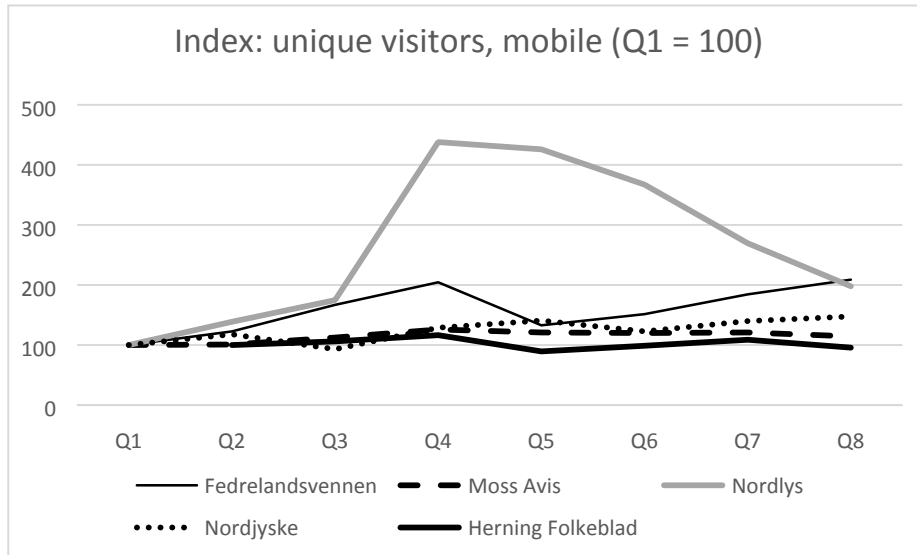
Appendix C. Development in unique visitors to desktop editions before and after paywall introduction, indexed.



Appendix D. Development in pageviews to desktop editions before and after paywall introduction, indexed.

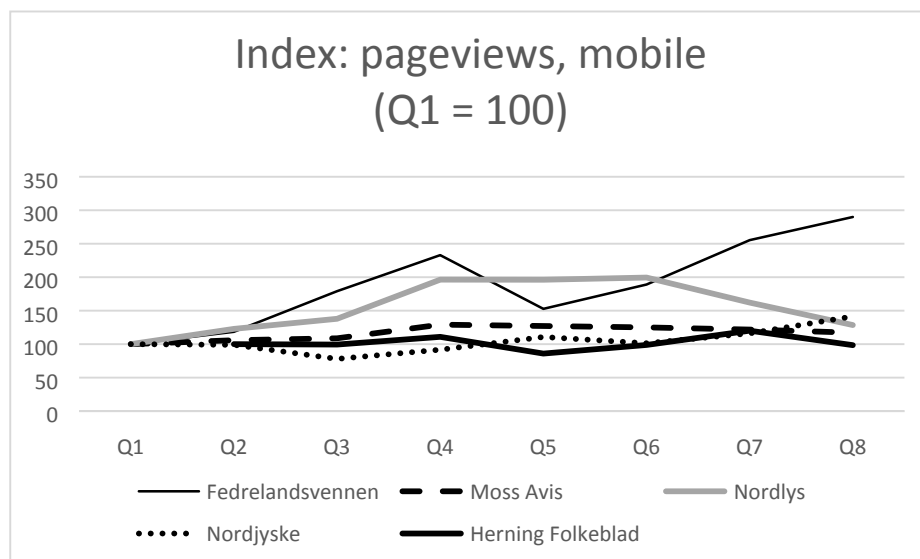


Appendix E. Development in unique visitors to mobile editions before and after paywall introduction, indexed



NOTE: For Herning Folkeblad Q2=100 as mobile traffic measure for Q1 is not available.

Appendix F. Development in pageviews to mobile editions before and after paywall introduction, indexed



NOTE: For Herning Folkeblad Q2=100 as mobile traffic measure for Q1 is not available.

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3 **TABLES WITH CAPTIONS**
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7 **Table 1.** Sample.
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| News website | Data available | Type of paywall | Date of paywall introduction |
|----------------------------------|--------------------|-----------------|------------------------------|
| <i>Fædrelandsvennen (N)</i> | Desktop and mobile | hard | May 14. 2012 |
| <i>Hallingdølen (N)</i> | Desktop | hard | November 5. 2011 |
| <i>Moss Avis (N)</i> | Desktop and mobile | soft | April 23. 2015 |
| <i>Nordlys (N)</i> | Desktop and mobile | soft | September 1. 2014 |
| <i>Herning Folkeblad (DK)</i> | Desktop and mobile | soft | October 2. 2014 |
| <i>Nordjyske (DK)</i> | Desktop and mobile | soft | June 13. 2017 |
| <i>Viborg Folkeblad (DK)</i> | Desktop | hard | November 7. 2012 |
| <i>Aarhus Stiftstidende (DK)</i> | Desktop | hard | November 7. 2012 |

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Table 2. Nine scenarios for outcome of significance testing of traffic development upon paywall introduction.

| | Significant increase in pageviews | Non-significant development in pageviews | Significant decrease in pageviews |
|---|--|---|--|
| Significant increase in unique visitors | Scenario 1 | Scenario 2 | Scenario 3 |
| Non-significant development in unique visitors | Scenario 4 | Scenario 5 | Scenario 6 |
| Significant decrease in unique visitors | Scenario 7 | Scenario 8 | Scenario 9 |

Table 3. The immediate effect of the introduction of paywalls (Q4-Q5).

| | Significant increase in pageviews | Non-significant development in pageviews | Significant decrease in pageviews |
|---|--|--|---|
| Significant increase in unique visitors | | | |
| Non-significant development in unique visitors | <i>Nordjyske (m)</i> | <i>Moss Avis (m)</i> <i>Nordlys (d)</i> <i>Nordlys (m)</i> <i>Nordjyske (d)</i> | <i>Herning Folkeblad (d)</i> |
| Significant decrease in unique visitors | | <i>Hallingdølen (d)</i> <i>Moss Avis (d)</i> | <i>Fædrelandsvennen (d)</i> <i>Fædrelandsvennen (m)</i> <i>Herning Folkeblad (m)</i> <i>Viborg Stifts Folkeblad (d)</i> <i>Aarhus Stiftstidende (d)</i> |

NOTE. *d*=desktop. *m*=mobile. Hard paywalled news sites in bold text.

Table 4. The longer-term effect of the introduction of a paywall (Q4-Q8).

| | Significant increase in pageviews | Non-significant development in pageviews | Significant decrease in pageviews |
|---|--|---|---|
| Significant increase in unique visitors | <i>Nordjyske (m)</i> | <i>Nordjyske (d)</i> | |
| Non-significant development in unique visitors | <i>Fædrelandsvennen (m)</i> | <i>Herning Folkeblad (m)</i> | <i>Moss Avis (m)</i> |
| Significant decrease in unique visitors | | <i>Aarhus Stiftstidende (d)</i> | <i>Fædrelandsvennen (d)</i> <i>Hallingdølen (d)</i> <i>Moss Avis (d)</i> <i>Nordlys (d)</i> <i>Nordlys (m)</i> <i>Herning Folkeblad (d)</i> <i>Viborg Stifts Folkeblad (d)</i> |

NOTE. *d*=desktop. *m*=mobile. Hard paywalled news sites in bold text.

Table 5. Immediate and longer-term development in number of pageviews per unique visitor.

| News website | PV/UV ratio (Q4) | PV/UV ratio (Q5) | PV/UV ratio (Q8) | Difference (Q4-Q5; %) | Difference (Q4-Q8; %) |
|-----------------------------|------------------|------------------|------------------|-----------------------|-----------------------|
| Fædrelandsvennen (d) | 5.09 | 5.47 | 5.85 | 7.4* | 14.9* |
| Fædrelandsvennen (m) | 4.12 | 4.16 | 5.02 | 0.9 | 21.9* |
| Hallingdølen (d) | 3.37 | 3.96 | 3.92 | 17.6* | 16.5* |
| Moss Avis (d) | 5.43 | 6.37 | 5.18 | 17.3* | -4.7 |
| Moss Avis (m) | 3.57 | 3.66 | 3.57 | 2.5 | -0.2 |
| Nordlys (d) | 3.68 | 3.93 | 4.63 | 7.0 | 25.9* |
| Nordlys (m) | 2.03 | 2.09 | 2.94 | 2.8 | 44.8* |
| Herning Folkeblad (d) | 11.61 | 9.82 | 9.42 | -15.4* | -18.8* |
| Herning Folkeblad (m) | 5.95 | 6.00 | 6.43 | 0.9 | 8.1 |
| Nordjyske (d) | 12.37 | 11.57 | 10.92 | -6.5 | -11.7 |
| Nordjyske (m) | 6.78 | 7.49 | 9.12 | 10.5 | 34.6 |
| Viborg Stifts Folkeblad (d) | 18.72 | 10.57 | 17.14 | -43.5* | -8.4 |
| Aarhus Stiftstidende (d) | 37.53 | 13.37 | 30.90 | -64.4* | -17.7 |

NOTE. * $p < .05$. d=desktop. m=mobile.

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For Peer Review Only

FIGURE WITH CAPTION**Figure 1.** Timeline of the structuring of the empirical material.