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**Geography and Media – Does a Local Editorial Office
Increase the Consumption of Local News?**

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Abstract: Urbanization and new digital technologies have significantly altered the news media industry. One major change is the disappearance of local editorial offices in many regions. This paper examines if there is a relation between access to local media in terms of editorial offices and journalists, and the likelihood of the public consuming local news. The study builds on fine level data for Sweden in 2006 and in 2013, allowing for a comparison of trends. Our results suggest that the existence of an editorial office in the municipality is not significantly related to the consumption of local newspapers but that accessibility to employed journalists who live in the municipality is.

Keywords: urbanization, digitization, editorial offices, journalist location, local media access, media consumption

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1. Introduction

The past century has experienced a persistent trend of population and corporate movement towards urban agglomerations. Cities attract people and businesses for a variety of reasons: they are centers of consumption; they provide a rich variety of services and consumer goods; they usually have more attractive physical attributes and better public services; and they offer speed in terms of less commuting time to different employment opportunities (Glaeser et al., 2001).

As a result of urbanization, population size in non-urban areas has been declining, which in turn has led to a decrease in local demand for important public functions, some of which have even disappeared (Bjerke and Mellander, 2016). Simultaneously, the development of the internet has led to radical societal changes, and not the least how firms operate. Such advances have decreased the marginal costs of distributing information goods to almost zero, which has had an impact on many industries, including retailing, media, and entertainment products. As the economic activities of these industries have gone digital, how and where goods are produced and consumed have been highly affected (Peitz and Waldfogel, 2012).

The decrease of demand in non-urban markets, combined with large populations switching to online news consumption have created difficulties for newspapers to achieve scale advantages in many regions in Sweden. One impact is that the local presence of editorial offices has decreased in a number of regions. Data from Statistics Sweden show that between 2006 and 2013, Swedish municipalities as a whole have lost 17 percent of the editorial offices and 19 percent of the employed journalist positions. Specifically, rural municipalities have lost 14 percent of their editorials and journalist positions, while urban regions lost 20 percent of them.

We might surmise that the marginal effect of these losses is actually greater in rural areas, since the number of editorial offices and journalists were fewer there to start with. However, the decreasing numbers clearly indicate that “blaming” the disappearance of media supply purely on urbanization does not give the complete picture, as cities are losing their editorials and journalists, too. This reflects the extent to which newspapers are affected by the fact that digital media has taken over much of the news reporting. Waldfogel (2015) even argues that digitization is the main reason why this supply shift in media has happened.

The effects of the overall decline in the number of local editorial offices are still unclear, but public opinion points to a threat against local democracy (Benkő, 2013; Malmberg, 2014; Strömbäck, 2014). News media is a crucial democratic institution with immense influence, even power, when it comes to affecting both political participation (Gentzkow et al., 2011) and how voters vote (Della Vigna and Kaplan, 2007; Hetherington, 1996).

While these effects of local media on democracy have been discussed, to our knowledge no one has empirically tested if there is a significant relation between the location of local media production and the likelihood of the public consuming local news.¹ Based on a unique dataset in Sweden that tracks local media consumption patterns of over 2000 individuals every year, this paper seeks to analyze that relation. While controlling for individual and regional characteristics, we test if the existence of an editorial office in the municipality is positively correlated to the frequency of reading local newspapers, both in print and online. We also examine whether individuals are more likely to consume local news in areas where the local and intra-regional accessibility to journalists living there is

¹ With “local news”, we define consumption of local newspapers in paper or internet form. If individuals read both, the one that is read the most is included.

higher. We consider where employed journalists live rather than where they work, with an assumption that journalists cover those topics they can themselves relate to and thereby would be considered relevant for others in their region. Further, we examine whether our results differ for urban vs. rural municipalities. To study whether consumption patterns have changed over time, we conduct the analysis for two points in time, 2006 and 2013, a period in which news became more centralized and more digitalized.

Our results suggest that the existence of an editorial office in the municipality is not related to the frequency of local news consumption in either of the time periods. However, accessibility to journalists living in the municipality shows a positive and statistically significant relation in 2013 but not in 2006. This result holds true in both urban and rural municipalities, but has a stronger magnitude in the latter. This indicates that even if the number of editorial offices has declined over time, it does not have an impact on the consumption of local news, but the domicile location of the journalists does matter, which we surmise is because their vested interests in their domicile location increases the likelihood of local news being covered in the media.

2. Theory and concepts

2.1 Economies of urbanization and digitization

In addition to population movements towards urban regions, we also observe increasing spatial concentration of economic activity in a number of geographical areas, typically cities. These persistent urbanization trends are happening because cities have the potential to create positive externalities through advantages of geographical proximity in the form of agglomeration benefits (De Groot et al., 2009; Porter, 1998). From a firm's perspective, locating in large and urban markets comes with many advantages such as higher productivity levels from more educated workers, higher innovation rates, larger network

effects, lower transport costs, stronger labor markets, greater potential for knowledge spillovers, externalities, sharing of local infrastructure, more urban amenities, higher entrepreneurial activity, and other factors (Duranton and Puga, 2004; Glaeser and Mare, 2001; Porter, 1998).

But the flipside of urbanization and all its good characteristics is that the quality of life in rural areas, where the labor markets are weaker and information flow is not as high, has slowly deteriorated over time. As young people move away to urban centers, causing long-term negative net-migration, lack of demand has led to a decrease in the number of services in rural areas. This challenge is not limited to only a few places; in fact, it is happening on a very large scale, as fully 86 percent of Sweden's 290 municipalities have experienced a loss of young people over time (Bjerke and Mellander, 2016).

One result of this demographic shift has been that many rural areas in Sweden have seen local editorial offices close down, and now have limited coverage in the local news. News and information markets have traditionally been local and bounded in space with high fixed costs partly due market size and to consumers with different preferences (which also can be locally bounded) (Sinai and Waldfogel, 2004). Because of their small operational scale, local newspapers have higher per-copy costs compared to newspapers operating in larger markets. Such costs need to be overcome by a satisfactory efficiency level, lower wages and good exploitation of advertising demand (Reddaway, 1963). Therefore the media sector is characterized by a relatively high concentration in a limited number of large cities where they create local clusters of media firms (Davis et al., 2009; Krätke and Taylor, 2004). Hence, many rural markets are increasingly experiencing the closing of local editorial offices at the speed of urbanization. These municipalities simply do not have

enough demand for newspaper firms to cover their costs and it is not profitable for them to locate there anymore.

In addition, the development of digital technology with its continuously declining costs of storage, data transmission and computation have created opportunities for many economic activities to go digital. There are almost no entry barriers in digital markets. Possibilities for new marketplaces are constantly created due to the very low costs of communication and distribution over long geographical distances, especially for information services (Goldfarb et al., 2015). This has the potential to affect how and where such goods are consumed, as geographical boundaries lose their importance (Blum and Goldfarb, 2006; Sinai and Waldfogel, 2004; Sunstein, 2001). Many researchers have argued that such developments have “killed” distance and geography (Cairncross, 2001; Ohmae, 1995). Perhaps, the most powerful of such claims is the one of Friedman (2005), who proposed that “the world is flat” due to the existence of a new global platform for communication and information exchange.

One of the most common arguments regarding the lower readership frequency of local newspapers in paper-form is that individuals now have access to the same information on different webpages, or through social media. The internet was expected to either displace traditional print media, or to push it into specializing in new niches (van der Wurff, 2011). While earlier research suggested that access to the internet would not substantially diminish the use of traditional media since internet users tend to read newspapers more often than those who do not use the internet (Althaus and Tewksbury, 2000; Chyi and Lasorsa, 2002), more recent research suggests that internet and newspapers are in fact mutually exclusive substitutes for one another (de Waal and Schoenbach, 2010).

In effect, the development of the internet has been shifting newspaper consumption online and making it possible to increase the diversity of the news consumed due to cheap or free access to a wide range of sources, including social media. Digitization also makes it easier to fulfill “niche” tastes, which is difficult to achieve using traditional media due to high production costs relative to limited geographical markets (Gentzkow and Shapiro, 2015). These changes in the supply conditions are making it possible for individuals to consume what is the most attractive to them (Waldfogel, 2015).

However, the benefits of digitization vary by location, where smaller regions benefit the most as they do not have a large variety of options in their own market (Balasubramanian, 1998; Forman et al., 2009; Goldfarb and Tucker, 2011). Hence, from the point of view of availability of news, the closing down of local editorial offices may not be a major issue for concerned areas, since news is still available online via other channels. It may even be the case that local *paper* media is less significant since news is accessible online to everyone, regardless of location, and most often even for free.

Still, the lack of local coverage is often portrayed as a democratic challenge since people living in these areas are less likely to get their voices heard, and their daily challenges are less likely to be covered in the media. This has been referred to as a “media shadow” (Nord and Nygren, 2002), which from a policy perspective has been addressed by the government through subsidies given to the smaller editorial offices and newspapers since the beginning of the 1970’s (Nygren and Althén, 2014).

2.2 Other determinants of news consumption

Research on the consumption of media has also long considered individual-level variables to news exposure (Althaus et al., 2009). Age usually displays a positive relation with newspaper readership. Also, studies show that men read more than women, but this

conclusion strongly depends on the country of study (George and Waldfogel, 2003; Hallin and Mancini, 2004; Lauf, 2001; Weibull, 2005). Education has ambiguous effects. A number of studies find that highly educated people read more newspapers (Schoenbach et al., 1999; Vaage, 2006). This effect is, however, less clear in countries like Sweden where newspapers have a high penetration rate in the market (Gustafsson and Weibull, 1997; Lauf, 2001). Household income is usually positively correlated to newspaper readership (Bucklin et al., 1989; Elvestad and Blekesaune, 2008). Weibull (2005) also discusses that political interest and trust in the press are variables that should be positively correlated to the likelihood of reading newspapers.

Despite the research focus on individual-level characteristics, the literature on news consumption that considers whether any contextual factors might condition individual choices is limited. A few studies have sought to provide analysis, though some are now dated. Tillinghast (1981) argues that with a higher degree of urbanization, individuals read more newspapers. Johansson (1995) suggests that smaller regions tend to read more local newspapers, while larger cities rely on national ones. Althaus et al. (2009) finds that population density, a measure of urbanization, is negatively related to consumption of local news on television and radio, suggesting that mostly rural markets are more interested in local news delivered on those media. Density is however statistically insignificant when it comes to newspaper readership.

There is also a vast literature on the competition between national and local newspapers, most often supporting the hypothesis that national and local newspapers are substitutes to one another (Bucklin et al., 1989; Cho and Lacy, 2002; Lacy and Dalmia, 1993). Meanwhile, research on the relation between radio, TV and newspaper readership is not unanimous. On one hand, there is empirical evidence on the substitution effect that these

types of media use have on one another (Blair and Romano, 1993; Bucklin et al., 1989). Dertouzos and Trautman (1990) on the other hand find no evidence that local media suffer from such competition. They argue that this result may be due to other market characteristics which are not included in the model. Other research supports the hypothesis that they are complements; those who read newspapers are information seekers who also watch and listen to news (Ferguson, 1983; Leung and Wei, 1999).

Given the above theory and concepts, we seek to examine in this paper the role of local media supply for local media consumption, while still controlling for individual and regional characteristics. More specifically, we examine the relation between local editorial offices and the location of journalists on one hand and the likelihood of consuming local media on the other. Our hypothesis is that individuals are more likely to consume more local news if there is a local editorial office and/or if there are more journalists living in the local area, since it is more likely that issues individuals find important will be covered.

3. Variables and Method

We employ datasets primarily from two sources. Individual level data comes from the “National SOM” survey (Society, Opinion, Media). Since 1986, the SOM Institute in Gothenburg University has been conducting yearly surveys that focus on: social-, public opinion-, and media themes, to understand how society changes affect Swedish people's attitudes and behavior (SOM Institutet, 2015). The National SOM in our selected years 2006 and 2013 were carried out two and four parallel studies respectively, with a total of 6050 and 17000² respondents respectively, living in Sweden between the ages of 16 and

² Even if that is the total number of people who have answered the surveys, the questions we are interested in have not been answered by everyone. In the survey of 2006, the question was sent to every respondent, but in the study of 2013 the question was only sent to three out of the four parallel studies. Also, we are only considering the respondents who have answered that they read local newspapers and we disregard the rest, resulting in lower number of observations in our models.

85, chosen by a systematic probability sample.³ When analyzing the 2006 survey, Nilsson (2007) argues that the response rate of 60 percent in combination with the representativeness of the respondents, makes the survey data material representative for the current habits and attitudes of the Swedish adult population. The survey of 2013 has a response rate of 53 percent. A thorough evaluation of data quality concludes that young people, men, and people with weak social ties are to varying degrees under-represented, but this affects very few issues. Hence, if such shortcomings are recognized, the 2013 survey is also representative for analysis regarding attitudes and behavior of the Swedish adult population (Vernersdotter, 2014).

Data on the newspaper industry and municipality characteristics are collected from Statistics Sweden's microdata which covers the full population. To select the newspaper industry, we use the SNI industry codes for "publishing of daily newspapers" (22121 for SNI 2002 and 58131 for SNI 2007).

3.1 Variables

We categorize our independent variables into (1) news supply (the main variables of interest), (2) regional municipality characteristics, (3) alternative means of assessing news, and (4) individual characteristics. The variables are presented in Table 1:

(Table 1 about here)

Table 1 - List of variables

Variables	Measured as
Dependent Variable *	
Frequency of reading local newspapers	Categorical variable: 0- Never (0 days a week) 1- Sometimes (1 day a week – 5 days a week) 2- Often (6 days a week – 7 days a week)

Independent Variables:

³ More information can be found on <http://som.gu.se/undersokningar/den-nationella-som-undersokningen>

<i>News supply**</i>	
Editorial office	Dummy=1 if there is an editorial office in the municipality.
Local journalist accessibility	Local accessibility to journalists who live in the municipality and are employed in an editorial office (logged variable). ⁴
Regional journalist accessibility	Intra-regional accessibility to journalists who live in the municipality and are employed in an editorial office (logged variable).
<i>Regional characteristics**</i>	
Population Density	Population per square kilometer (logged variable).
Metropolitan region	Dummy=1 if the municipality is located in Stockholm's, Gothenburg's or Malmö's labor market region.
<i>Alternative means of accessing news*</i>	
National news (reading)	Frequency of reading national news (online or paper-form). Alternatives range from 0 to 8 starting with "Never" to "7 days a week."
Local news on TV or listen on radio	Frequency of watching local news on TV or listen on radio. Alternatives range from 0 to 5 starting with "Never" to "Every day."
National news on TV or listen on radio	Frequency of watching national news on TV or listen on radio. Alternatives range from 0 to 5 starting with "Never" to "Every day."
<i>Individual Characteristics*</i>	
Gender	Dummy=1 if individual is male.
Age	Individual's age when the survey was conducted.
Education	Dummy=1 if individual has a university degree.
Swedish Language	Dummy=1 if the individual speaks Swedish at home (only available for year 2013).
Household Income	Individuals could choose from 8 categories in 2006 and 12 categories in 2013.
Media trust	Alternatives range from 1 to 5 starting with "Low media trust" to "High media trust."
Interest in politics	Alternatives range from 1 to 4 starting with "Not at all interested" to "Very interested."
Culture consumption	Alternatives range from 0 to 6 starting with "Never" to "Many times a week".
Reading books	Alternatives range from 0 to 6 starting with "Never" to "Many times a week."

*Data source: SOM Institute, **Data source: Statistics Sweden

⁴ See Andersson and Klaesson (2009) for the formal presentation of how local and intra-regional accessibility measures are calculated.

Dependent Variable: Local Media Consumption

To measure the frequency of local news consumption, we combine two questions from the surveys, which have been adjusted between the two points in time (2006 and 2013), partly due to the changing characteristics of the market.

In 2006 the questions were formulated as follows:

- Do you read a morning newspaper regularly? If you read more than one, first enter what you consider your main newspaper. The question does not regard online reading.
- Do you read the following newspapers on the internet?

In 2013 the second question was adjusted to:

- Do you regularly read or watch morning newspapers on the internet?

Based on information from the survey, we distinguish between local and national newspapers and only categorize an individual as a “local media consumer” if they explicitly write out that they read at least one local newspaper. If the individual reads two local newspapers, we pick the most frequent one. Also, we do not differ between reading news online or on paper form and we again pick the one read the most. If an individual states that he or she reads local news often, we assume that this person most likely is a subscriber. However, we have no data on subscriptions.

3.2 Method

To examine the role of local media supply for local media consumption, we use multivariate statistical techniques. The dependent variable, frequency of newspaper readership, is ordered and takes the values of 0 (never reading local newspapers), 1 (reading local newspapers up to 5 days a week) and 2 (reading local newspapers 6-7 days

a week). Hence, given the nature of the data, we employ a heteroscedastic ordered logit model (HOL) since traditional OL models make an assumption of proportional odds, i.e., the distance between every category of the variable is proportional (Greene, 2008), which is violated in our dataset. Williams (2010) suggests *heteroscedastic ordered linear models* (HOL) to be the best potential solution. Greene and Hensher (2008) argue that another way out is switching to *multinomial logit models*. The problem with this latter solution is that the model is misspecified if used with ordered choice models and the coefficients produced are difficult to interpret into something meaningful.

4. Empirical Findings and Analysis

In regard to the results from the regression analysis, the purpose is to study the relation between the likelihood of consuming local news (whether via print or online) and access to news supply in terms of editorial offices and the location of journalists, while controlling for individual and regional characteristics. We will only analyze and discuss the marginal effects, calculated at the means of HOL models, presented on Tables 2 - 4. We trust the results of this method over the OL one because it relaxes the assumption of proportional odds which is violated in our data. To make sure that results are robust, we also run a multinomial logit, which gives very similar results to the HOL (these results are available from the authors upon request). We present in the appendix the coefficients of the OL and HOL regression (Table A3 and A4). Table 2 presents the marginal effects of the whole sample in 2006 and 2013. The dependent variable is the frequency of reading local newspapers, categorized as *Never*, *Sometimes* and *Often*.

(Table 2 about here)

Table 2 –Marginal effects for heteroscedastic ordered logit for 2006 and 2013. Dependent variable is the frequency of local newspaper readership.

Variables	2006			2013		
	$\partial \Pr(y = \text{Never})$	$\partial \Pr(y = \text{Sometimes})$	$\partial \Pr(y = \text{Often})$	$\partial \Pr(y = \text{Never})$	$\partial \Pr(y = \text{Sometimes})$	$\partial \Pr(y = \text{Often})$
	∂x	∂x	∂x	∂x	∂x	∂x
Editorial office	0.00259 (0.0204)	0.00373 (0.0326)	-0.00632 (0.0529)	0.0142 (0.0586)	0.000568 (0.00548)	-0.0148 (0.0632)
Access. to local journalists	-0.00903 (0.00954)	-0.0127 (0.0108)	0.0217 (0.0152)	-0.0647** (0.0261)	-0.00176 (0.0148)	0.0665*** (0.0159)
Access. to journalists in the region	-0.0194 (0.0151)	-0.0274 (0.0244)	0.0468* (0.0264)	0.00345 (0.0298)	9.41e-05 (0.00110)	-0.00355 (0.0306)
Population density	0.0407** (0.0180)	-0.0591*** (0.0207)	0.0185 (0.0241)	0.0686* (0.0414)	-0.000160 (0.00656)	-0.0684 (0.0446)
Metropolitan region	0.144 (0.184)	-0.264*** (0.0691)	0.120 (0.161)	0.149 (0.172)	-0.00283 (0.0411)	-0.146 (0.138)
National news (reading)	0.0471*** (0.0145)	-0.0343 (0.0216)	-0.0128 (0.0122)	0.0612*** (0.0167)	-0.0175*** (0.00424)	-0.0437*** (0.0143)
Local news tv/radio	-0.00442 (0.00374)	-0.00622 (0.00658)	0.0106 (0.00792)	-0.0462*** (0.0105)	-0.00126 (0.0107)	0.0475*** (0.00645)
National news tv/radio	-0.00976 (0.00655)	-0.0137 (0.0131)	0.0235* (0.0133)	-0.0258** (0.0114)	-0.000703 (0.00604)	0.0265** (0.0115)
Gender	0.0117 (0.00880)	0.0163 (0.0150)	-0.0280* (0.0160)	-0.0183 (0.0187)	-0.000513 (0.00421)	0.0188 (0.0184)
Age	-0.000616* (0.000337)	-0.000867 (0.000824)	0.00148** (0.000749)	-0.00685*** (0.00219)	-0.00260 (0.00415)	0.00945*** (0.00235)
Education	0.0151 (0.00971)	0.0196 (0.0187)	-0.0347* (0.0178)	-0.0473* (0.0267)	-0.00237 (0.0102)	0.0497** (0.0220)
Swedish language	- (0.0421)	- (0.0549)	- (0.0467)	-0.302*** (0.0421)	0.0742 (0.0549)	0.228*** (0.0467)
Household income	-0.00701* (0.00389)	-0.00987 (0.00843)	0.0169** (0.00671)	-0.0181** (0.00703)	-0.000493 (0.00414)	0.0186*** (0.00449)
Trust in media	-0.00908 (0.00613)	-0.0128 (0.00990)	0.0219*** (0.00827)	-0.0370*** (0.0129)	-0.00101 (0.00860)	0.0380*** (0.0116)
Interest in politics	0.000492 (0.00463)	0.000693 (0.00643)	-0.00118 (0.0110)	-0.0234 (0.0192)	-0.000638 (0.00517)	0.0240 (0.0159)
Culture consumption	-0.00327 (0.00311)	-0.00460 (0.00448)	0.00787 (0.00575)	-0.0155*** (0.00519)	-0.000423 (0.00373)	0.0159** (0.00734)
Read books	9.12e-05 (0.00143)	0.000128 (0.00198)	-0.000220 (0.00341)	-0.0237*** (0.00571)	-0.000646 (0.00554)	0.0244*** (0.00521)
Observations	2,280	2,280	2,280	2,523	2,523	2,523

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

For *news supply*, no statistically significant relation is found between the existence of an editorial office in the municipality and the likelihood of consuming local news. This did not change during the years of study, indicating that even when digitalized news did not have a large share of the market in 2006, there was still no significant relation between the variables.

On the other hand, the relationship between the local accessibility to journalists living in the municipality and likelihood of consuming local news did change over time. While insignificant in 2006, local accessibility to journalists displays significance and larger magnitude in 2013, when an increase in local accessibility to journalists relates to a decrease in the probability of individuals to *never* read local newspapers, and an increase in their probability to report that they *often* read local newspapers. When it comes to regional accessibility to journalists, statistical significance is only found in 2006; where an increase in the regional accessibility to journalists raised the odds of an individual to report reading local news *often*. Why this variable lost its statistical significance in 2013 is hard to know. If we were to speculate, perhaps it might be that people become more selective in what they are interested in reading, which may only be “very” local news that does not pass their municipality border. This would further explain why local accessibility to journalists becomes more important over time.

Continuing with *regional characteristics*, results show that both in 2006 and 2013, the probability of individuals reporting that they *never* read local newspapers increases with municipal size in terms of population density. In 2006, the probability of *sometimes* reading local newspapers decreased with market size but this relation is statistically insignificant in 2013.

As for *alternative means of accessing news*, a competition effect which becomes starker over time is seen between local and national newspapers. For both years, an increase in the frequency of reading national news was related to an increase in the probability of *never* reading local

newspapers, with a stronger magnitude in the latter year. The likelihood of individuals reporting that they *sometimes* or *often* read local newspapers decreases if they instead read more national news. However, this is only the case for 2013, which can perhaps be explained by the fact that individuals became more selective about what kind of news they are interested in reading and prefer one to the other. A complementary relationship is however found between following local and national news on TV or radio, and reading local newspapers. An increase in the frequency of watching national news on TV and radio is positively related to the likelihood of *often* reading local news in both 2006 and 2013. As for local news on TV and radio, the positive relationship is only significant in 2013.

As for the effects of individual characteristics, results show that, age, household income, trust in media, and knowledge of Swedish are positively correlated to the probability of individuals reading local newspapers *often*. Gender is only significant in 2006 when males were less likely to report that they read news 6-7 days a week. As for the education variable, highly educated individuals were less likely to report that they often read local newspapers in 2006. However, results from 2013 show the opposite; where education obtains of a positive sign. Whether the individual is interested in politics, consumes culture or reads books, all gain significance in 2013 with a positive relation to *often* reading newspapers and negative relation to the probability of *never* reading local newspapers.

Differences between urban and rural municipalities

We now move on to the same analysis, but this time we divide our sample depending on whether the individual lives in an urban or rural area, since we are interested in seeing if there is an urban-rural ‘divide’ when it comes to the consumption of local news. Table 3 presents marginal effects of the HOL in 2006:

(Table 3 about here)

Table 3 Marginal effects for heteroscedastic ordered logit for 2006 when the sample is divided into rural and urban municipalities. Dependent variable is the frequency of local newspaper readership.

Variables	Rural			Urban		
	$\partial \Pr(y = \text{Never})$	$\partial \Pr(y = \text{Sometimes})$	$\partial \Pr(y = \text{Often})$	$\partial \Pr(y = \text{Never})$	$\partial \Pr(y = \text{Sometimes})$	$\partial \Pr(y = \text{Often})$
	∂x	∂x	∂x	∂x	∂x	∂x
Editorial office	0.00246 (0.0101)	0.0121 (0.0538)	-0.0146 (0.0638)	-0.0205 (0.0915)	-0.00960 (0.0215)	0.0301 (0.107)
Access. to local journalists	-0.000438 (0.00352)	-0.00198 (0.0158)	0.00242 (0.0193)	-0.0156 (0.0167)	-0.00846 (0.0237)	0.0241 (0.0329)
Access. to journalists in the region	-0.00856 (0.00608)	-0.0387 (0.0269)	0.0473 (0.0323)	-0.0323 (0.0329)	-0.0175 (0.0353)	0.0498 (0.0346)
Population density	0.00257 (0.00764)	-0.0393 (0.0284)	0.0367 (0.0293)	0.107 (0.254)	-0.207 (0.141)	0.100 (0.150)
Metropolitan region	0.0654 (0.0591)	-0.172*** (0.0660)	0.107 (0.0964)	0.0690*** (0.0240)	-0.0686 (0.0470)	-0.000333 (0.0442)
National news (reading)	0.0152*** (0.00520)	-0.0175*** (0.00651)	0.00225 (0.00597)	0.0665*** (0.0244)	-0.0490** (0.0245)	-0.0175 (0.0166)
Local news tv/radio	-0.00153 (0.00231)	-0.00691 (0.0108)	0.00843 (0.0131)	-0.00876 (0.0123)	-0.00474 (0.00919)	0.0135 (0.0134)
National news tv/radio	-0.00565 (0.00428)	-0.0256 (0.0161)	0.0312 (0.0200)	-0.00753 (0.00999)	-0.00407 (0.0103)	0.0116 (0.0155)
Gender	0.00392 (0.00363)	0.0176 (0.0160)	-0.0215 (0.0194)	0.0154 (0.0259)	0.00831 (0.0113)	-0.0237 (0.0219)
Age	-8.54e-07 (0.000121)	-3.86e-06 (0.000549)	4.72e-06 (0.000671)	-0.000660 (0.00186)	-0.00204 (0.00302)	0.00270* (0.00147)
Swedish language	-	-	-	-	-	-
Education	0.0123* (0.00663)	0.0421** (0.0204)	-0.0544** (0.0257)	0.00188 (0.0144)	0.00101 (0.00890)	-0.00288 (0.0231)
Household income	-0.00135 (0.00135)	-0.00613 (0.00626)	0.00748 (0.00753)	-0.0110 (0.00734)	-0.00597 (0.0126)	0.0170** (0.00801)
Trust in media	-0.00543* (0.00297)	-0.0246** (0.0114)	0.0300** (0.0138)	-0.0101 (0.0150)	-0.00545 (0.00752)	0.0155 (0.0109)
Interest in politics	0.000327 (0.00310)	0.00148 (0.0140)	-0.00181 (0.0171)	-0.00143 (0.00694)	-0.000775 (0.00396)	0.00221 (0.0105)
Culture consumption	-0.00102 (0.00196)	-0.00461 (0.00819)	0.00563 (0.0101)	-0.00568 (0.00743)	-0.00307 (0.00538)	0.00875 (0.00661)
Read books	0.000566 (0.000998)	0.00256 (0.00435)	-0.00313 (0.00533)	-0.00208 (0.00278)	-0.00113 (0.00329)	0.00321 (0.00511)
Observations	859	859	859	1421	1421	1421

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Starting with the *news supply* and *regional characteristics* in 2006, what stands out from the results is the statistical insignificance of all the variables in these groups, no matter whether the municipality is urban or rural. Neither the existence of editorials, the accessibility to journalists, nor the size of the market are significantly related to the frequency of consuming newspapers.

No regional differences are found when it comes to *alternative means of accessing news*. There is a statistically insignificant relation between reading local newspapers and following news (local or national) on TV or radio in both markets. However, if individuals read more national newspapers, the probability that they *never* or *sometimes* read local news is higher for both rural and urban municipalities. The magnitude of this competition effect is higher in cities.

For *individual characteristics*, gender, culture consumption, reading books and interest in politics are all statistically insignificant in both samples. Age and household income are positively related to the probability of *often* reading local newspapers for cities, but do not seem to matter when talking about rural markets. This is not in line with previous research which argues that they are key variables in determining newspaper readership. Highly educated individuals in rural areas are less likely to report that they *often* read local newspapers, and more likely to either *never* or *sometimes* read them. In contrast, trust in media is positively related to the likelihood of individuals who live in rural markets to *often* read newspapers, but negatively related to them reporting *never* or *sometimes*. These last two variables do not show any significant relation for individuals living cities.

Table 4 is still divided into rural and urban markets but reports on 2013:

(Table 4 about here)

Table 4 Marginal effects for heteroscedastic ordered logit for 2013 when the sample is divided into rural and urban municipalities. Dependent variable is the frequency of local newspaper readership.

Variables	Rural			Urban		
	$\partial \Pr(y = \text{Never}) / \partial x$	$\partial \Pr(y = \text{Sometimes}) / \partial x$	$\partial \Pr(y = \text{Often}) / \partial x$	$\partial \Pr(y = \text{Never}) / \partial x$	$\partial \Pr(y = \text{Sometimes}) / \partial x$	$\partial \Pr(y = \text{Often}) / \partial x$
Editorial office	-0.0118 (0.0411)	-0.00724 (0.0236)	0.0191 (0.0647)	-0.00193 (0.112)	0.000152 (0.00920)	0.00178 (0.103)
Access. to local journalists	-0.0318** (0.0143)	-0.0205* (0.0108)	0.0523** (0.0245)	-0.0735*** (0.0285)	0.0202* (0.0118)	0.0533** (0.0264)
Access. to journalists in the region	-0.00384 (0.0217)	-0.0315 (0.0228)	0.0353 (0.0276)	0.0382 (0.0606)	-0.00296 (0.00873)	-0.0352 (0.0577)
Population density	0.0290* (0.0171)	0.0187 (0.0116)	-0.0477* (0.0282)	0.127*** (0.0473)	-0.0143 (0.0235)	-0.113** (0.0465)
Metropolitan region	0.0569 (0.0717)	0.0266 (0.0228)	-0.0834 (0.0938)	0.0335 (0.243)	-0.00253 (0.0237)	-0.0310 (0.220)
National news (reading)	0.0334*** (0.00936)	0.000448 (0.00657)	-0.0338*** (0.00975)	0.0525** (0.0209)	-0.00407 (0.0125)	-0.0484*** (0.0116)
Local news tv/radio	-0.0293*** (0.00902)	-0.0189*** (0.00668)	0.0482*** (0.0149)	-0.0542*** (0.0103)	0.00421 (0.0115)	0.0500*** (0.0152)
National news tv/radio	-0.0140 (0.0122)	-0.00903 (0.00803)	0.0230 (0.0201)	-0.0279** (0.0137)	0.00217 (0.00583)	0.0258* (0.0149)
Gender	0.00709 (0.0224)	0.00456 (0.0141)	-0.0116 (0.0365)	-0.0430 (0.0262)	0.00328 (0.00983)	0.0397* (0.0235)
Age	-0.00350*** (0.00102)	-0.00664*** (0.00119)	0.0101*** (0.00121)	-0.00795*** (0.00203)	0.000133 (0.00380)	0.00782** (0.00350)
Education	-0.00575 (0.0286)	-0.00377 (0.0193)	0.00952 (0.0479)	-0.0787*** (0.0234)	0.00438 (0.0178)	0.0743*** (0.0169)
Swedish language	-0.303** (0.149)	0.00747 (0.0693)	0.295*** (0.0845)	-0.293*** (0.0431)	0.0818* (0.0421)	0.211*** (0.0497)
Household income	-0.0144*** (0.00450)	-0.00927*** (0.00299)	0.0237*** (0.00705)	-0.0167* (0.00873)	0.00130 (0.00409)	0.0154*** (0.00578)
Trust in media	-0.0356*** (0.0123)	-0.0230*** (0.00873)	0.0586*** (0.0201)	-0.0323 (0.0198)	0.00251 (0.00707)	0.0298 (0.0193)
Interest in politics	-0.00533 (0.0149)	-0.00344 (0.00947)	0.00877 (0.0243)	-0.0360* (0.0198)	0.00279 (0.00841)	0.0332** (0.0165)
Culture consumption	-0.00648 (0.00785)	-0.00417 (0.00496)	0.0106 (0.0128)	-0.0114 (0.00956)	0.000885 (0.00214)	0.0105 (0.0103)
Read books	-0.0143** (0.00609)	-0.00924** (0.00458)	0.0236** (0.0104)	-0.0279*** (0.00539)	0.00216 (0.00605)	0.0257*** (0.00648)
Observations	820	820	820	1,703	1,703	1,703

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Starting with the *media supply* variables, local accessibility to journalists is significantly related to an increase in the probability of individuals to *often* read local newspapers and a decrease in the probability that they *never* read them. However, the relation between local accessibility to journalists and the likelihood of individuals *sometimes* reading local news is of a positive sign in urban municipalities and a negative one for rural areas. The intuitive explanation in this case might be that if local accessibility to journalists increases, individuals living in rural municipalities will tend to read newspapers 6-7 days a week (*often*) and not less (*sometimes*). Those who live in cities, however, will associate an increase in accessibility with reading news at least *sometimes* but not necessarily 6-7 days a week. Hence, those who live in rural areas are more likely to become subscribers than those in cities if their municipality is covered more.

Continuing with *regional characteristics*, no differences are found in the market density, which is positively related to the probability of individuals reporting that they *never* read local newspapers but negatively related to *often* reading them. As market size increases, people read less local newspapers. The magnitudes are higher in cities, implying that market size matters more in already larger municipalities.

As for *alternative means of accessing news*, an increase in the frequency of reading national newspapers is positively related to the likelihood of individuals *never* reading local news and negatively related to them reporting *often* as an alternative. As expected, these magnitudes are stronger for urban markets as the probability of cities being covered in national newspapers is higher compared to rural municipalities. Consequently, the substitution effect is stronger there. Following local news on radio or TV decreases the probability of *never* reading local newspapers and increases *often* reading newspapers. These results imply that local TV or radio act as complements for local newspapers. However, when examining national news on TV or radio, a positive relationship with local newspapers is only found in urban markets. Perhaps this

is because people living in cities want to get more diversified news and use different sources to achieve that.

The only *individual characteristics* variable that does not show statistical significance in any of the markets is the frequency of consuming culture. Age, household income, frequency of reading books, and knowledge of Swedish are all positively related to the probability that people *often* read local newspapers and negatively to their *never* reading them, no matter where they live. Except for the frequency of reading books, all of them have stronger effects in the rural markets. In rural markets, people are more likely to read local newspapers in they trust media more, while this is not the case in cities. In cities, males, highly educated people, and those interested in politics are more likely to *often* read local newspapers and less likely to *never* read them. No statistical significance is obtained in rural markets.

To sum up, the collective results indicate that there is no significant relation between the existence of an editorial office in the municipality and the frequency of reading local newspapers in any of the time periods, in any of the market types. However, local accessibility to journalists living in the municipality obtains statistical significance with a positive relation to the frequency of reading local newspapers in 2013, though not in 2006. The statistical insignificance of this variable persists in 2006 even when the sample is divided into rural and urban markets. Yet, results of 2013 show that if local accessibility to journalists increases in rural markets, individuals are more likely to become subscribers. In urban markets, individuals are more likely to read local newspapers more frequently, but not as likely to subscribe as those in rural areas. This implies that even if there is no editorial office in the municipality, newspapers that hire journalists from different places in the region will likely have more readers, which may be because more municipal issues are covered in the news. It suggests that what matters the most is the coverage and not the location. Obviously, we assume that the editorial office cannot be located too far away, but we do not test for it.

5. Conclusions

The process of urbanization, combined with the developments of digital technologies, have strongly affected the local newspaper industry in Sweden where several local editorial offices are disappearing in many regions. Public opinions often argue that this is a threat to local democracy. However, to our knowledge, no one has empirically tested if there is a significant relation between access to local media in terms of editorial offices and journalists, and the likelihood of consuming local news. Our hypothesis is that individuals are more likely to consume local news if there are more local journalists living in and around the area, and/or if there is a local editorial office there, since it is more likely that issues individuals find important will be covered. We also examined whether the results differ for urban and rural municipalities. We conducted the study on two points in time, 2006 and 2013.

The results suggest that the existence of an editorial office in the municipality does not significantly relate to the consumption of local news, no matter the type of market and no matter the point in time. In contrast, what gains statistical significance in 2013 is the local accessibility to journalists living in the municipality. Such results show that higher local accessibility to journalists relates to a higher likelihood of individuals reading newspapers 6–7 days a week. This relation is of a stronger magnitude in rural markets than in cities. Regional accessibility to journalists was statistically significant only in 2006, where an increase in the regional accessibility to journalists raised the odds of an individual often reading local news.

Further, we found that market size is negatively correlated to local newspaper readership, with a stronger effect in cities, but it is only significant in 2013. National and local newspapers are substitutes to one another in both points in time. Following news on TV or radio is insignificant in 2006, but in 2013 TV and radio are complements to local newspapers, with stronger effects

in urban markets. Individual characteristics are strong determinants of news consumption and they usually take the expected signs predicted from previous research.

At this point, a question which arises is the one of causality. Do editorial offices leave because there is not enough demand or do individuals stop reading local newspapers because the editorial offices are not there? This is a process that most likely works both ways, which makes it difficult to argue about causality. This implies that we can only talk about relations and not about which variable causes what. While our data does not allow for any such further investigation, it would be useful to examine this in future studies related to the role of media supply and the consumption of local news. Nevertheless, our findings still broaden our understanding about the role of editorial offices and access to journalists in media consumption habits.

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Appendix

Table A 1 Descriptive Statistics 2006

	Observations	Mean	Median	Std.Dev	Min	Max
Editorial office	2697	0.891	1	0.312	0	1
Access. to local journalists	2697	3.307	3.292	1.630	0	6.596
Access. to journalists in the region	2697	2.422	2.064	1.653	0	6.377
Population density	2697	4.542	4.341	1.850	-1.204	8.334
Metropolitan region	2697	0.331	0	0.471	0	1
National news (reading)	2661	2.732	1	0.974	0	8
Local news tv/radio	2670	4.239	4	1.040	0	5
National news tv/radio	2691	4.525	5	0.748	0	5
Gender	2697	0.472	0	0.499	0	1
Age	2697	3.847	3.951	0.419	2.708	4.443
Education	2645	0.245	0	0.430	0	1
Household income	2546	4.559	4	1.965	1	8
Trust in media	2579	2.959	3	0.909	1	5
Interest in politics	2654	2.644	3	0.773	1	4
Culture Consumption	2612	1.713	2	1.389	0	6
Read books	2579	3.748	4	2.119	0	6

Table A 2 - Descriptive Statistics 2013

	Observations	Mean	Median	Std.Dev	Min	Max
Editorial office	4907	0.839	1	0.367	0	1
Access. to local journalists	4907	3.187	3.084	1.656	0	6.334
Access. to journalists in the region	4907	2.377	2.093	1.662	0	6.124
Population density	4907	4.788	4.494	1.950	-1.609	8.5
Metropolitan region	4907	0.372	0	0.483	0	1
National news (reading)	4904	2.184	0	3.170	0	8
Local news tv/radio	4799	1.481	1	1.614	0	5
National news tv/radio	4854	4.148	5	1.343	0	5
Gender	4904	0.483	0	0.500	0	1
Age	4904	3.874	3.970	0.410	2.773	4.443
Education	4780	0.298	0	0.457	0	1
Swedish language	4790	0.957	1	0.202	0	1
Household income	4598	5.493	5	2.866	1.000	12
Trust in media	4732	2.910	3	0.930	1.000	5
Interest in politics	4789	2.618	3	0.815	1.000	4
Culture Consumption	4777	2.852	3	1.413	1.000	6
Read books	3176	3.357	4	2.171	0	6

Table A 3 Coefficients for ordered logit and heteroscedastic ordered logit for 2006 and 2013. Dependent variable is the frequency of local newspaper readership.

VARIABLES	2006		2013	
	Heteroscedastic		Ordered logit	Heteroscedastic
	Ordered logit	Ordered logit		
Editorial office	0.458** (0.213)	-0.132 (1.103)	-0.0954 (0.314)	-0.121 (0.564)
Access. to local journalists	0.232** (0.104)	0.457 (0.311)	0.347*** (0.0638)	0.546 (0.355)
Access. to journalists in the region	0.315 (0.204)	0.983** (0.491)	-0.00218 (0.156)	-0.0292 (0.252)
Population density	-0.437** (0.186)	-0.260 (0.599)	-0.375*** (0.130)	-0.570** (0.258)
Metropolitan region	-0.245 (1.291)	0.167 (5.901)	-0.811 (0.780)	-1.233 (0.971)
National news (reading)	-0.259*** (0.0485)	-0.829** (0.377)	-0.212*** (0.0363)	-0.432* (0.222)
Local news tv/radio	0.0925*** (0.0289)	0.223 (0.172)	0.195*** (0.0272)	0.390 (0.303)
National news tv/radio	0.127** (0.0501)	0.494* (0.290)	0.0961** (0.0458)	0.218 (0.196)
Gender	-0.0729 (0.0709)	-0.589* (0.347)	0.0853 (0.0856)	0.155 (0.175)
Age	0.00561 (0.00448)	0.0312* (0.0166)	0.0346*** (0.00543)	0.0685 (0.0644)
Education	-0.00125 (0.103)	-0.741* (0.386)	0.173* (0.0890)	0.405 (0.264)
Swedish language			1.327*** (0.192)	2.377 (1.943)
Household income	0.0677 (0.0567)	0.355** (0.139)	0.0959*** (0.0216)	0.153 (0.103)
Trust in media	0.152*** (0.0529)	0.459** (0.192)	0.171*** (0.0518)	0.312 (0.258)
Interested in politics	-0.0348 (0.0728)	-0.0249 (0.233)	0.118* (0.0635)	0.198* (0.117)
Consume culture	0.0690* (0.0358)	0.165 (0.131)	0.0510* (0.0279)	0.131 (0.144)
Read books	-0.00812 (0.0260)	-0.00462 (0.0715)	0.107*** (0.0207)	0.200 (0.164)
Pseudo R square	0.1035	0.2310	0.1977	0.2056
Observations	2280	2280	2,523	2,523

Robust standard errors in parentheses

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

Table A 4 Coefficients for heteroscedastic ordered logit for 2006 and 2013. For both points in time the sample is divided into rural and urban municipalities. Dependent variable is the frequency of local newspaper readership.

VARIABLES	2006		2013	
	Rural	Urban	Rural	Urban
Editorial office	-0.165 (0.706)	1.216 (3.921)	0.161 (0.535)	0.00775 (0.448)
Access. to local journalists	0.0281 (0.223)	0.959 (1.777)	0.440** (0.207)	0.273 (0.174)
Access. to journalists in the region	0.549 (0.342)	1.981 (2.135)	0.272 (0.201)	-0.153 (0.271)
Population density	0.246 (0.307)	-1.253 (1.315)	-0.400* (0.228)	-0.503 (0.332)
Metropolitan region	0.0344 (1.337)	0.864 (11.11)	-0.716 (0.799)	-0.135 (0.937)
National news (reading)	-0.281** (0.134)	-1.690 (1.086)	-0.302*** (0.101)	-0.210** (0.101)
Local news tv/radio	0.0979 (0.147)	0.537 (0.615)	0.405*** (0.122)	0.217 (0.204)
National news tv/radio	0.362 (0.267)	0.461 (0.751)	0.194 (0.162)	0.112 (0.124)
Gender	-0.250 (0.229)	-0.945 (0.752)	-0.0979 (0.305)	0.173 (0.113)
Age	5.48e-05 (0.00779)	0.0877 (0.0960)	0.0814*** (0.0186)	0.0326 (0.0322)
Education	-0.690* (0.358)	-0.115 (0.957)	0.0799 (0.399)	0.319 (0.227)
Swedish language			3.013** (1.353)	1.180 (0.903)
Household income	0.0869 (0.0822)	0.676 (0.742)	0.199*** (0.0595)	0.0671 (0.0507)
Trust in media	0.348* (0.181)	0.617* (0.357)	0.492*** (0.189)	0.130 (0.0979)
Interested in politics	-0.0210 (0.199)	0.0878 (0.426)	0.0737 (0.205)	0.144 (0.0883)
Consume culture	0.0654 (0.120)	0.348 (0.326)	0.0895 (0.105)	0.0457 (0.0725)
Read books	-0.0363 (0.0612)	0.127 (0.258)	0.198* (0.103)	0.112 (0.0880)
Pseudo R square	0.1247	0.2174	0.1222	0.2448
Observations	859	1421	820	1703

Robust standard errors in
parentheses

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