The Impact of Internet on the Market for Daily Newspapers in Italy.

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Abstract

Recent years have seen a surge in websites which provide news and information for free and up to the end of 2001 traditional daily newspapers in Italy have shown a growing trend towards putting on line for free the exact articles published on paper.
In order to assess whether on-line news and traditional daily newspapers are substitute, complement or independent goods, I model the choice between different daily newspapers as a discrete choice among differentiated products. Considering the availability of a website as a newspaper characteristic and controlling for other observable and unobservable characteristics of newspapers and of the outside good, I estimate a logit model of demand on market level data from 1976 to 2001 for the main national daily newspapers in Italy. Results suggest that opening a website had a negative impact on their market shares. I calculate the implied short-run and long-run loss in sales.
Unsurprisingly, starting from the end of 2001, many daily newspapers introduced a fee to read on-line the paper edition of the newspaper.

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[1] See Censis(2001) for a survey of media consumption in Italy.

1 - Introduction

Internet has undoubtedly been the major economic innovation of the last decade. Among its main effects was the introduction of new products, such as music, videos, e-books and news, which are or might be expected to be substitutes for old ones. Yet the question of product substitutability with the appearance of Internet has not received much attention in the literature, especially with regard to the markets for news and books.

This paper focuses on the issue of substitutability between the old and new product by looking at the market for daily newspapers in Italy. As recent years have seen a surge in websites which provide news and information for free and, up to the end of 2001, daily newspapers publishers have shown a growing trend towards putting on line the exact articles published on paper, it appears an ideal setting for an attempt to assess product substitutability.

Table 1 below reports the results from a survey of the Italian resaearch centre Censis, carried out in the year 2000. Almost 26% of the people interviewed reported reading less newspapers and magazines since they started surfing on Internet. Of course such a statement does not allow us to distinguish whether they read less magazines only or also less newspapers and, what's more important to our purpose, whether they were just spending less time reading the newspaper they bought or they were actually buying less newspapers.
My aim is to answer to the second of these two questions, that is to check whether less people buy newspapers because of Internet.

Table 1 - Changes in the use of old media because of Internet (% of population above 14 years of age)

"I use less"	"since I use Internet"
Books	29,2
Newspapers and magazines	25,8
TV	50,5
Radio	21,6

Censis, 2001
(Notice that it was possible to give more than one answer).

In fact, following the appearance of Internet and on-line news, a priori three substitution effects can be expected and, at least, to a certain extent distinguished: one from the general availability of Internet, as people allocate less time to reading (and thus do not buy newspapers) in order to surf (effect 1), a second one from the general availability of news on line, whereby people do not buy newspapers as they prefer to read news via Internet (effect 2), and a third one from the opening of the website of the newspaper itself and the availability of the exact articles of the printed edition, whereby people do not buy a newspaper as they prefer to read it on the Internet (effect 3). One could then further distinguish between whether people do not buy the paper edition of the newspaper because they prefer to read it on-line (effect 3a) or whether they do so because they prefer to read the on-line edition (effect 3b).

Historically the market for newspaper has already experienced the first two kinds of substitution effects as the appearance of TV changed the reading habits of the Italian population and the appearance of TV news put an end to the second edition of most Italian newspapers[2].

[2] FIEG(1982-2002), Censis(1961-2002).

I focus here on the third of these three conceivable substitution effects and I therefore look for the effect of the appearance of a newspaper website on its marketshare on paper.

To do so I model consumer choice among different daily newspapers as a choice for a differentiated product, I consider the existence of a website as a product characteristic of the traditional newspaper and I estimate a logit model of demand using market level data for the period 1976-2001 on the four main national newspapers in Italy, namely *Corriere della Sera*, *La Repubblica*, *La Stampa* and *Il Giornale, a*ll of which, except *il Giornale*, launched and mantained a website in the period under consideration. I then calculate the effect of the decision to go on line on the number of copies sold.
Results from the estimation of the logit model suggest that website provision had a negative impact on the market shares of those who opened it. The estimated short run loss in sales is 16527 for *Corriere della Sera*, 15001 for *La Repubblica* and 8949 for *La Stampa*, on average around 2.7% of their marketshares. These numbers are consistent with estimates on the number of on-line readers of the traditional newspapers calculated by other sources. The estimated long run losses are instead 140638, 127659 and 76151 respectively, on average approximately 22.7%.

Unsurprisingly, starting from the end of 2001, many Italian daily newspapers introduced a fee to read on-line the paper edition of the newspaper. And so did all the national newspapers above who had a website, that is *Corriere della Sera*, *La Repubblica* and *La Stampa*.

After a very brief discussion in the next section of the existing literature, in Section 3 I give a general description of the traditional newspaper market in Italy and describe the sample of newspapers on

which I carry out my analysis. In Section 4 I describe the development of the on-line market for news in Italian and the history and features of the websites of the four newspapers in my sample. Section 5 provides a general overview of the dataset. Section 6 introduces the structural model of demand whereas Section 7 discusses the estimation. Section 8 reports and comments on the results. Finally, in Section 9, I conclude and identify lines for future research.

2 - The literature

The question of product substitutability with the appearance of Internet has not received much attention in the literature, especially with regard to the markets for news and books.

A few papers in the business literature have dealt with newspapers on-line (Mings & White (2000), Cameron, Curtin & al. (1996) and Cameron, Hollander et al. (1997)). But only very recently, contemporaneously to my work, two papers have appeared dealing with the issue of on line and traditional newspapers.

Kaiser (2002) has analysed the effect of website provision on the demand for German women's magazines. Yet in the context of women's magazines the features of the websites seem, a priori already, to point towards a possible complementarity than substitutability between the two products rather. In this context estimates from a logit and a nested logit demand model on market level data suggest that website provision did not significantly affect magazine's market shares.

Gentsow (2004) has instead tested for substitutability, or complementarity between the Washington Post and its on-line edition in a newly developed model that allows multiple choices and complementarity. Estimates of his model on consumer level data, controlling for consumer characteristics but not for product characteristics, provides at best only evidence for weak substitutability between the two.

Before them, most of the econometric work on the traditional market for daily newspapers had attempted to estimate either the price elasticity of demand, as Reekie (1976) and Blair & Romano (1993), to identify the main features of the pricing decisions by a newspaper publisher, as Booth et al. (1991) and Fisher & Konieczy (2000), or to assess the cause of the observed trend towards monopolisation as Dertouzos & Trautman (1990). Cecchetti (1986) has instead studied the frequency of price adjustment whereas Willis (2000) has estimated price adjustment costs in the US market for magazines. Some other studies, such as Hakfoort & Weigand (2000), have dealt with the market for magazines, which of course shares many features with the one for daily newspapers.
No one, except Kaiser(2002) and Gentzkow(2004), has however chosen to use discrete choice models of product differentiation when estimating demand for newspapers or magazines.

Yet discrete choice models of product differentiation are a natural tool when estimating demand for daily newspapers. These models are by now widely used in empirical industrial organisation. They all build on the seminal work by McFadden (1973,1978,1981), Hausman & Wise(1978) and Hausman & McFadden(1984) on discrete choice models[3], but they usually try to link the random utility model at the basis of consumer demand with models of product differentiation for the supply side of the market (Anderson & al(1992)).
The more frequently used are logit and nested logit. Their limitations have been outlined (Berry (1994); Berry et al.(1995),Nevo (2000)), as they have been found to place restrictive assumptions on patterns of substitution between products and therefore on both marginal effects of price and price elasticities. Thus recent research often uses also the more flexible random coefficients or mixed logit models (Berry &

al(1995), Nevo(2001), McFadden & Train(2000), Petrin (2002)). Such a model is more general and allows for substitution between products to depend on product characteristics through observable consumers demographics. But it is not solvable analytically and requires to be estimated by simulation (Nevo(2000)). So that logit or nested logit models not only offer interesting benchmark cases but are still widely used for their computational simplicity or when the implied restrictions on price elasticities and marginal effects are not considered crucial (Brenkers & Verboven(2002), Kaiser(2002)).
As I will argue below, logit offers a good analytical tool in this case, as long as I restrict my analysis to a group of substantially similar daily newspapers for which I can easily assume that substitution takes place on the basis of market shares.

3 – Daily newspapers

Today in Italy there are well above 100 registered daily newspapers[4]. There are of course some national newspapers and many local ones. Although some of them are owned by political parties or by members of political parties, most of them are independent. Naturally however, with the possible exception of sport newspapers, they are all more or less characterised politically. Interestingly, tabloids are in practice not existent in the daily market (though they are quite widespread in the weekly and monthly ones) and free daily newspapers appeared only in 2000.

The Italian Federation of Newspapers Publishers (FIEG) traditionally classifies daily newspapers according to their geographic diffusion,to

[3] See Train(1993).
[4] However, many of them have a very limited circulation and some are not even sold at the newsstand. For instance, only 64 publishers of 70 daily newspapers are today

their content and to whether they are owned by a political party or not. It therefore distinguishes between a) provincial b) regional c) multiregional d) national e) political f) financial g) sport and other) daily newspapers.

Although I am ready to acknowledge the need for further investigation on the issue of market definition for newspapers (as well as for newspaper advertising), I follow here the market definition used by FIEG, as done also by the Italian Antitrust Authority in a complaint investigated some years ago[5].

But the market for daily newspapers has also been evolving substantially in the 26 years under consideration. Some now national newspapers were born with a strong regional or even local characterization. Many of them have been adding local chronicles through the years, while others made agreements with local newspapers which allowed the two to be sold together at a lower price. What's more, there has been a growing trend for political newspapers to become generalist newspapers, therefore including rich business and sport sections. Last but not least, the '90s saw the introduction of all kinds of weekly supplements and of a growing number of promotions which resulted in the bundling of the copy of the daily newspapers with books, videotapes, cassettes, audio CDs, CD-ROMs and, more recently, DVDs. Although in most cases bundling has left the consumer free to buy the newspaper alone or together with the bundled product (mixed bundling), in the case of some weekly magazines bundled to the newpaper, if the reader wanted to read the newspaper (the weekly magazine), he had to buy the supplement (the newspaper) and was thus forced to pay the higher price for the bundle (pure bundling). In the econometric analysis which follows I control for these evolving characteristics of daily newspapers.

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members of Federazione Italiana Stampa (FIEG) and only 52 daily newspapers are certified by Accertamento Diffusione Stampa (ADS).

In order to investigate if there is any evidence of a substitution between the product on paper and the one on-line, I chose to carry out the analysis on the four main national newspapers, namely *Corriere della Sera*, *La Repubblica*, *La Stampa* and *Il Giornale*. As a first approximation, I therefore assume that a person going to the newsagent who does not find one of them will buy one of the others, if any of course. Together with *l'Avvenire, il Giorno and il Foglio*, these three newspapers belong to the national market as defined by FIEG and, according to the latter, in 2001 they alone accounted for 91% of the average daily sales on that market, while the national newspapers accounted for almost 36% of all the average daily sales of daily newspapers.

Figure 1 reports the average daily sales in each month from January 1976 to December 2001 for these four daily newspapers. *Corriere della Sera,* founded in 1876, has been, in the last few years, the one selling more copies, fiercely competing with *La Repubblica*, while *La Stampa*, which being founded in 1867 is the oldest, enjoys consistently lower sales in the period considered here. *La Repubblica* was born exactly in January 1976. The graph of its average daily sales seems to follow the usual S-shape well-known in the literature on product diffusion. *Il Giornale* was instead launched in June 1974. The jump in sales which took place in 1994 coincides with the appearance into politics of its owner Silvio Berlusconi.

Looking at the graphs it is also possible to notice that a strong monthly seasonality affects the data, albeit not necessarily the same one for all newspapers.

The timing of the spikes which can be observed in Figure 1 in January 1989 for *Corriere della Sera* and in January 1987 for *La Repubblica*

[5]See Decision 3354/95 Ballarino vs Grandi Quotidiani

coincide respectively with *Portfolio* and *Replay*, two games of the lotto kind which could be played only and simply by buying a copy of the newspaper (at the normal price).
Finally, the opening of the website is an event which took place near the end of the period considered here, as we will discuss in the next section.

Last but not least, a particular feature of the Italian newspaper market has always been the lack of price competition. Up to the end of 1987 the price was set through the publishers association FIEG. From the 1st of January 1988 the price was officially liberalized. However, up to today agreements on price changes appear to be common practice, at least among the main national newspapers[6]. Only through bundling a limited variability of prices across newspapers has appeared[7].

[6] See the Italian Antitrust Authority communication to the Italian Authority for Broadcasting and the Publishing Industry in January 1996. More in Argentesi & Filistrucchi (2004)
[7] For a discussion on identification of the price effect when it varies only with bundling see Filistrucchi(2003).

Figure 1 - Corriere della Sera, La Repubblica, La Stampa & Il Giornale on paper

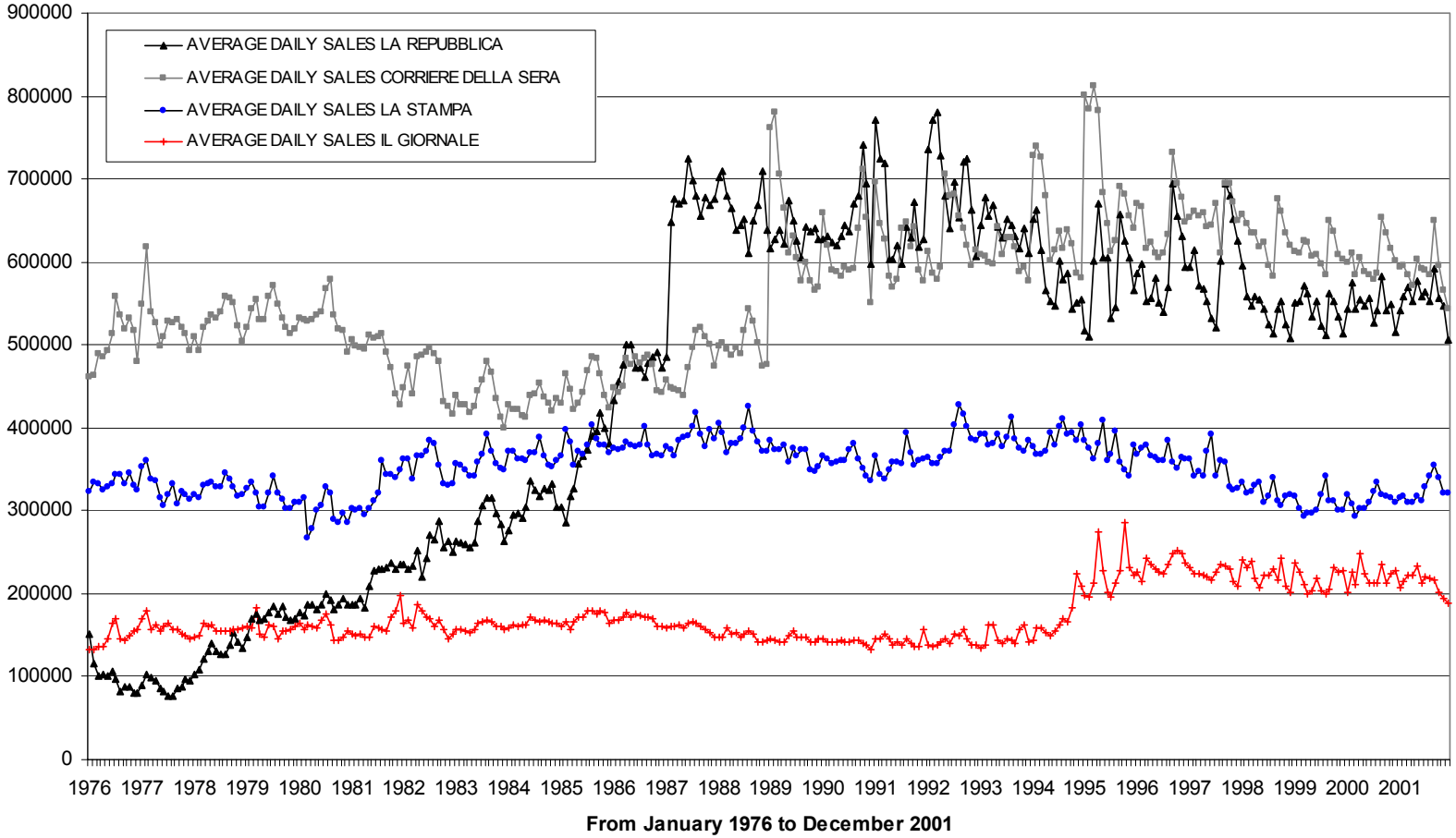

Figure 2 shows the nominal price of the three daily newspapers we take into consideration from January 1976 to December 2001 in a day of the week when none of them issues a supplement. It is evident at first sight that prices have always changed almost simoultaneously even after their liberalization.It is because of this particular feature that in the econometric analysis I will claim to be allowed to consider prices as exogenous, or at least pre-determined, to the single publisher decision.

Table 2 – Nominal Prices of Corriere della Sera, La Repubblica, La Stampa & Il Giornale on paper

Since	Corriere della Sera	La Repubblica	La Stampa	Il Giornale
01/06/74	£ 150	£150	£150	£150
01/05/77	£ 200	£ 200	£ 200	£ 200
11/03/79	£ 250	£ 250	£ 250	£ 250
01/08/79	£ 300	£ 300	£ 300	£ 300
17/08/80	£ 400	£ 400	£ 400	£ 400
01/08/82	£ 500	£ 500	£ 500	£ 500
01/02/83	£ 500	£ 500	£ 500	£ 500
01/07/84	£ 600	£ 600	£ 600	£ 600
20/10/85	£ 650	£ 650		£ 650
05/01/86			£ 650	
01/08/86	£ 700	£ 700	£ 700	£ 700
14/06/87	£ 800	£ 800	£ 800	£ 800
01/03/88	£ 900	£ 900	£ 900	£ 900
01/08/88	£ 1000	£ 1000	£ 1000	£ 1000
01/08/90	£ 1200	£ 1200	£ 1200	£ 1200
28/06/93	£ 1300	£ 1300	£ 1300	£ 1300
02/01/95	£ 1400	£ 1400	£ 1400	£ 1400
10/04/95	£ 1500	£ 1500	£ 1500	£ 1500
01/06/01				£ 1700
01/12/01	£ 1700	£ 1700	£ 1700	

4 - News on the web

The last few years have witnessed a surge in the number and quality of websites providing news and information, as reported in Table 3 below. Many of them were opened by publishers already present in the traditional markets, but a growing number of them is constituted by so called webzines, that is publications which are available on-line only

Most traditional publishers are by now on-line, albeit with much different products and not always with a product specially designed for the web. In particular 106 Italian daily newspapers were present on-line in December 2001. [8]

Table 3 - Number of news and information sites by type and date

Site type	Dec. 1997	Dec. 1998	Dec. 1999	Dec. 2000	Dec. 2001
Daily newspapers	44	54	62	76	106
Periodicals	226	326	501	559	1051
Webzines	128	197	412	772	1141
Total	398	577	975	1408	2298

Source: Webtime[9]

The increase in the number of news and information sites corresponded also to an increase in the quality of the sites themselves.
Among daily newspapers in particular there appears to have been a growing trend towards putting on line the exact articles published on paper, but also an increasing tendency towards developing an original on-line edition, as reported in Table 4 below.

Table 4 - Number of daily newspapers web sites by maximum on-line content and date

[8] The first newspaper to appear on-line was the local *L'Unione Sarda* at the beginning of 1995, followed by the political *L'Unità* in August and the national *La Stampa* in September.
[9] Webtime is an on-line observatory on news on the web. Its address is www.ipse.com.

On line content	Dec. 1997	Dec. 1998	Dec. 1999	Dec. 2000	Dec. 2001
All articles	11	25	33	54	73
Some articles	6	6	8	7	10
First page	6	7	8	1	3
Presentation	6	8	7	4	12
Under construction	5	3	3	6	7
Not updated	6	2	0	2	0
Newspapers review	4	3	3	2	1
Total	44	54	62	76	106
of which					
with editorial portal	0	0	4	23	23
with local portal	0	3	3	10	17
with on-line newspaper edition	1	1	1	9	12

Source: Webtime

Up to the end of 2001 all daily newspapers websites did not require payment of any fee for access to the information and news they provided, and even for reading the articles which appeared also on the traditional newspaper. Since the end of 2001 some of them started to ask for a fee. In January 2002, *La Repubblica* was the first one among the four national newspapers in our sample, to introduce subscription fees to read on-line the paper edition of the newspaper, while maintaining however a free on-line edition. *Corriere della Sera* and *La Stampa* soon followed its example.[10]

Among the four national newspapers we chose to restrict our analysis to, the first one to go on-line was *La Stampa*, which opened its website

[10] It appears therefore that a new business model is believed necessary for the future. This provides weak evidence in favour of product substitutability. But an alternative explanation for the choice of daily newspapers to set up a fee could be their inability to cover costs through on-line advertising following the end of the .com bubble on the stock exchange and the economic downturn that followed.

www.lastampa.it in September 1995 and since the beginning made available on the web the traditional newspaper.

Corriere della Sera opened its website in December 1996 and it too put on-line the exact articles of the printed edition, but initially the website had to be found inside the website of the publisher holding RCS. Only in January 1998 was the new independent website www.corriere.it opened.

The official website of La Repubblica was instead opened in January 1997 at the address www.repubblica.it, after a brief trial in April 1996 as a specialised website on the occasion of the Italian elections at the address www.repubblica.interbusiness.it. From its very beginning in 1997 it started to provide in addition to all the articles of its printed edition an original on-line newspaper. Exactly one year later in January 1998 the on-line newspaper started to be continuously updated during the day and two years later in January 1999 it started providing news on-line 24 hours a day (this last feature was later discontinued)[11].

Curiously, *Il Giornale* is one of the few daily newspapers in Italy who does not have a website.

As already mentioned above, after a two month trial registration period, in January 2002 *La Repubblica* introduced fees to read on-line the traditional newspaper and search its archive, while maintaining free access to its on-line news. From the same date it became also possible to download the whole newspaper in pdf format. Soon also *Corriere della Sera* and *La Stampa* adopted a similar business model.

Even once the existence of supply in the on-line market is established, in order to assess whether substitution is likely to be taking place, one would ideally want to see evidence of on-line readership for these newspapers websites, for news sites in general and evidence on Interned

[11] Still in 1999 the portal Kataweb, owned by the publisher of *La Repubblica*, was launched and from September of that year it started to provide free Internet connections,e-mail and web space.

use[12]. Unfortunately such data are impossible to find for the first years of life of news websites and more generally of Internet. And even when available they are not easily comparable to each other because standards in measuring Internet audience have been varying a lot and have been agreed upon only very recently[13]. As a result I cannot use them in the estimation process[14]. They can however offer a descriptive, albeit incomplete, picture of these new phenomena.

On the first day of its life, the 14th of January 1997, the website of *La Repubblica* recorded approximately 500.000 page views. During the 19 days trial period in April 1996 it had enjoyed an average of approximately 300.000 page views a day. Figure 2 shows average daily page views per month for *La Repubblica*, as well as for *Corriere della Sera* and *La Stampa*, from the January 1999 to December 2002. Although the panel of observations is very unbalanced and quite incomplete, average daily pageviews for *Corriere della Sera* appear to be lower than those from *La Repubblica* but still higher than those for *La Stampa*. Figure 3 shows instead average daily pageviews for *La*

[12] In addition, the availability of these data would clearly simplify the separate identification of the three candidate Internet effects mentioned above.

[13] Internet diffusion and use can be measured by number of hosts, by number of Internet accounts or through surveys or panels of individuals (or households). Internet traffic to a website can be measured either through surveys, panels, websites activity log files and/or through websites cookies. There are also methodological questions regarding the collection of this data, as for instance one downloads a page twice because the first attempt was not completely successful or because it keeps an open window on that page which is automatically refreshed by the browser and so on, so that data on pageviews have to be cleaned. Only in March 2002 Audiweb has started to operate, providing complete measures of Internet audience in Italy for advertising purposes. Still it chose to provide two kinds of audience measures: those deriving from a panel of individuals and those deriving from on-line websites log files. It set however rules for the collection of each of these data. See www.audiweb.it

[14] Another difficulty has to be faced if one wants to use data on on-line newsreadership in the estimation. Unless registration and a password is required it is not always possible to identify how many different different individuals (or households) chose to access a website in a given day, which would be the equivalent of how many people (or households) bought a copy of the newspaper. You have to trust, if at all available, the representativity of panels of individuals (or households) or of those who did not delete cookies. Other measures of Internet traffic,such as downloaded pages (also called

Repubblica, in each month from January 1999 to January 2001, disaggregated by sectors of the website. In this period, pageviews relating to the traditional edition of the newspaper grew from 66447 to 218813 and were, after the homepage itself, the main component of overall page views (around 20%), with the on-line edition being the third and continuously updated flash news enjoying much lower readership[15]. In any case, according to all sources, *La Repubblica* has up to now always been by far the most popular newspaper website and also one of the most popular news and information sites for connections from Italy.[16]

All in all, although data are incomplete and dishomogeneous, on-line news reading appears to have been growing considerably and to have become a substantial phenomenon well before the year 2001, the end of our sample period. There is then scope to believe substitution between

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pageviews), do not instead allow to distinguish between the number of individuals (or households) who chose the product and the intensity of use (pages read)

[15] However, as discussed in note 14, it is impossible to say how much of the observed growth in the number of downloaded pages is due to an increase in the number of on-line readers and how much is instead due to an increased number of pages read by each of them.

[16] In May 2001, for example, using a panel of on-line surfers, Nielsen-NetRatings estimated 724473 unique visitors and 15804751 page views for La Repubblica while respectively 384351 and 7676761 for Corriere della Sera. Exactly one year before through 12000000 random phone-calls to Italians above 14 years of age Between had estimated 1140000 on-line readers for La Repubblica and only 540000 for Corriere della Sera. But in August 2000 Nielsen-Netratings estimated 426889 unique visitors and 10639266 pageviews for La Repubblica.

traditional newspapers and on-line news might have taken place already before 2001 (and of course might still be taking place). Assessing the existence and eventually the size of this substitution effect is therefore the aim of the econometric analysis which follows.

Figure 2 - Corriere della Sera, La Repubblica & La Stampa on line

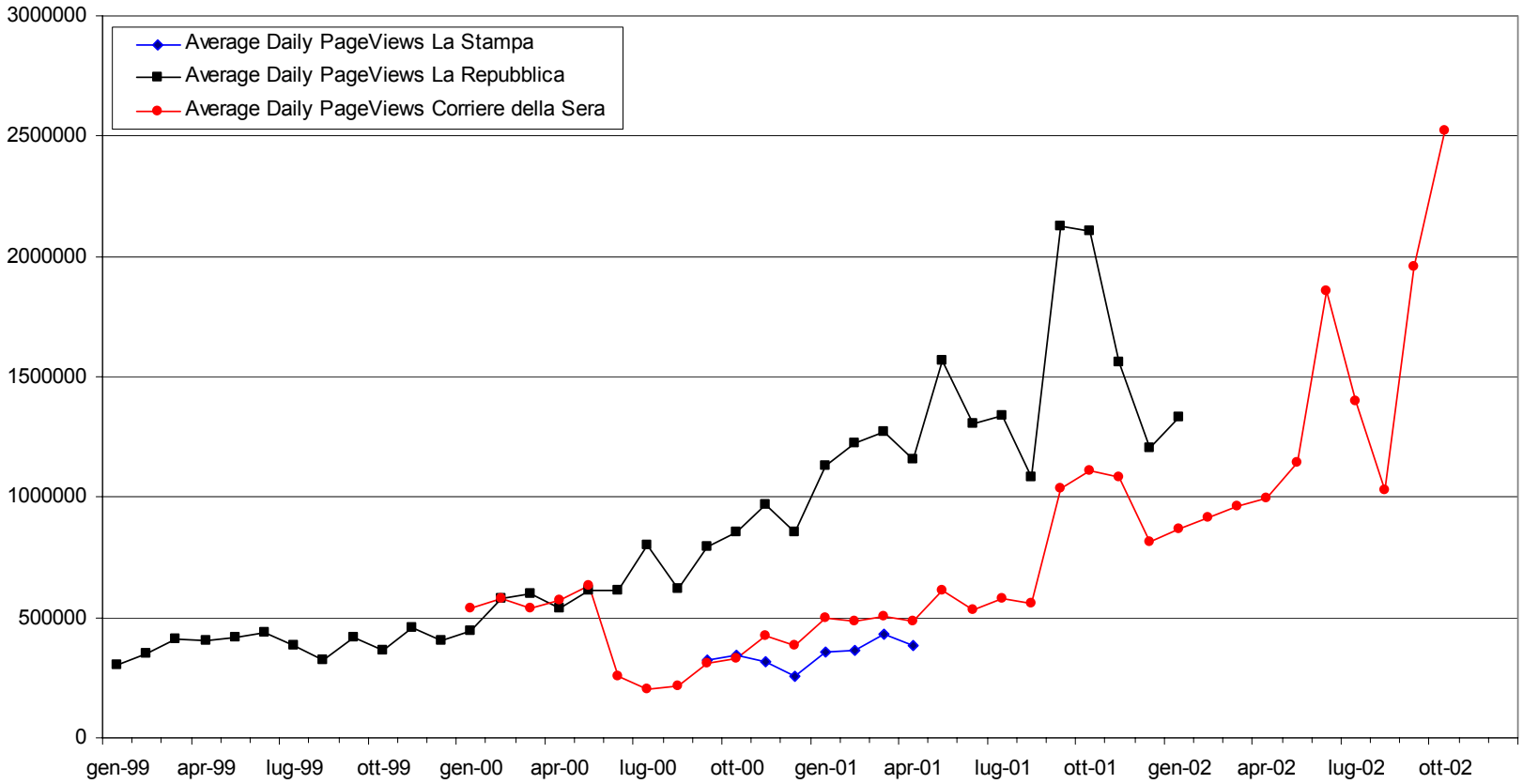
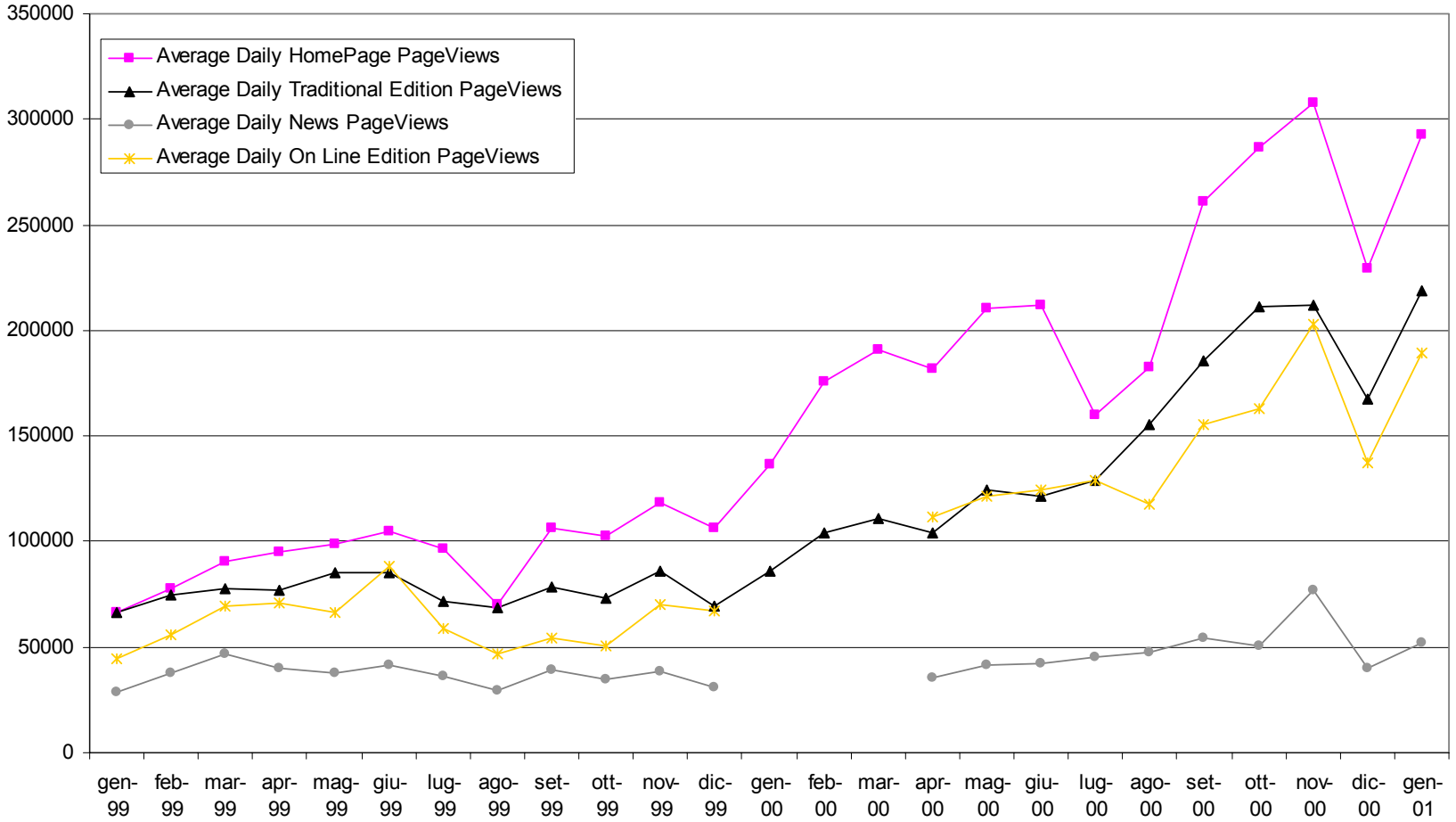


Figure 3 - La Repubblica on web



5 – The data

The dataset I use in the analysis mainly draws from the data collected every year, from 1976 onwards, by the association Accertamento Diffusione Stampa (ADS), data which cover most national and local newspapers, though not exactly all of them. ADS certifies the validity of this information for advertising purposes. Newspapers are free to choose whether to have their data certified or not, but if they choose so they are obliged to provide all the information required and the truthfulness of the reported information can be verified by the ADS. Most of the Italian newspapers chose certification, some of them did not, or at least did so only discontinuously. All in all, however, the data collected by ADS provide quite a complete picture of the dynamics of the market in question for the last 28 years.

The information available for each newspaper includes, at various levels of disaggregation data on sales, prints, gift copies, free subscriptions and paid subscriptions. In particular, they include data on average daily sales in each month and average daily prints in each month and for each different weekday in each month[17].
We then added to the database other useful information, mainly obtained by newspaper publishers themselves, such as the nominal prices of the newspapers, the dates of editors changes and their names, the dates the bdifferent supplements first appeared, the list of all promotions with the corresponding periods and the dates the different local chronicles were added to some of the national newspapers or the national newspaper was bundled to a local one.

For the purpose of this study, I also collected the dates of the opening of the newspapers web-sites, the period the traditional newspaper was

available on-line for free and,more generally, the dates of major changes to the characteristics of the websites.

In order to estimate a model of demand for the traditional market for daily newspapers my first choice would be to use the average number of copies sold in Italy in each month by newspapers agents, thus leaving aside the number of paid subscriptions. As Internet news are a relatively recent phenomenon and subscriptions are bound to react with staggering to any external shock, a substitution between news on-line and on paper would have been more difficult to detect if subscription were considered rather than sales at the newsstand. In so doing I am implicitly assuming that, if observed, a decline in the average daily sales would not be matched by a counter increase in paid subscription. In fact, as shown in Figures 4, 5,6 and 7 below, the latter are only a very small part of most Italian daily newspapers circulation[18], mainly because traditionally copies to subscribers have always been delivered through the general mail service, which implies they reach destination in the middle of the morning only, too late for people going to work[19].

However, by using monthly observations, I would be unable to control adequately for confounding factors when identifying the effect of the website, as I would not, for instance, exploit the fact that weekly supplements are bundled to a given newspaper only on given weekdays and that on that day the price is higher compared to same newspaper in other days and to other newspapers on that day. As I have data on average daily prints for each different weekday in each month and I can calculate the average daily ratio of sales to prints in each month, I

[17] Thus, for instance, for the Mondays of July 1979, the Tuesdays of that month and so on.
[18] In 2001 for instance paid subscriptions amounted to only 6,8 % of total circulation for national daily newspapers and to 9% for all daily nespapers certified by ADS . See FIEG(2002).
[19] See Fieg(2002).

derive data on average daily sales by weekday multiplying prints by this ratio. The plausibility of the results clearly relies on the assumption that the ratio is constant across weekday in a given month. This is an assumption that, of course, I cannot test but that I believe reasonable and that allows me to enjoy the greater information provided by more disaggregated data.

Figure 4- Corriere della Sera on paper

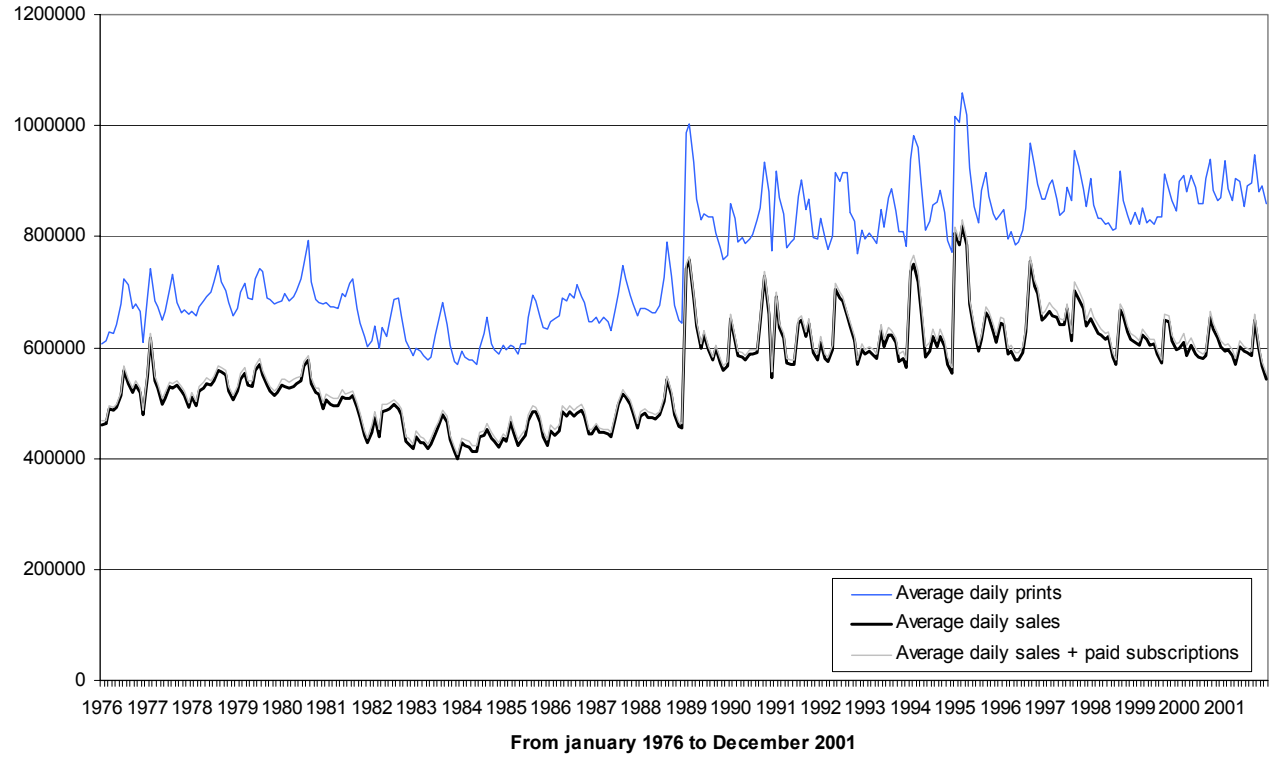


Figure 5 - La Repubblica on paper

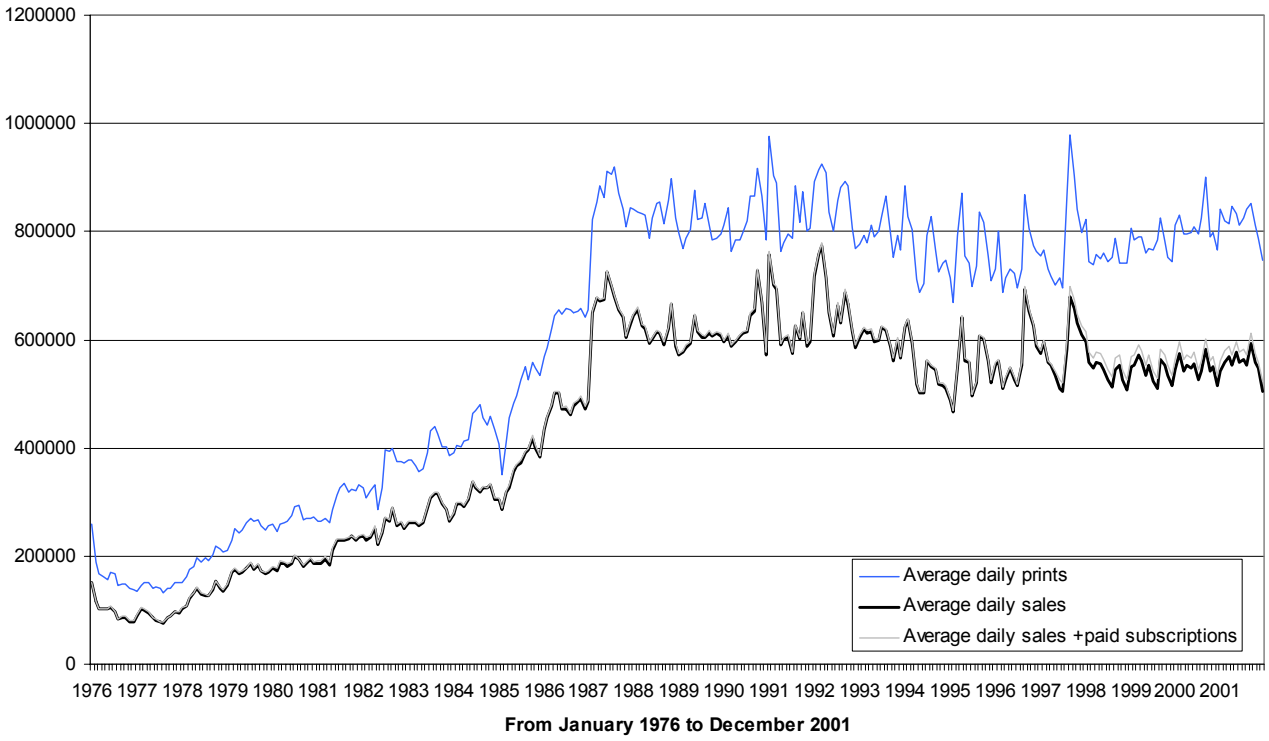
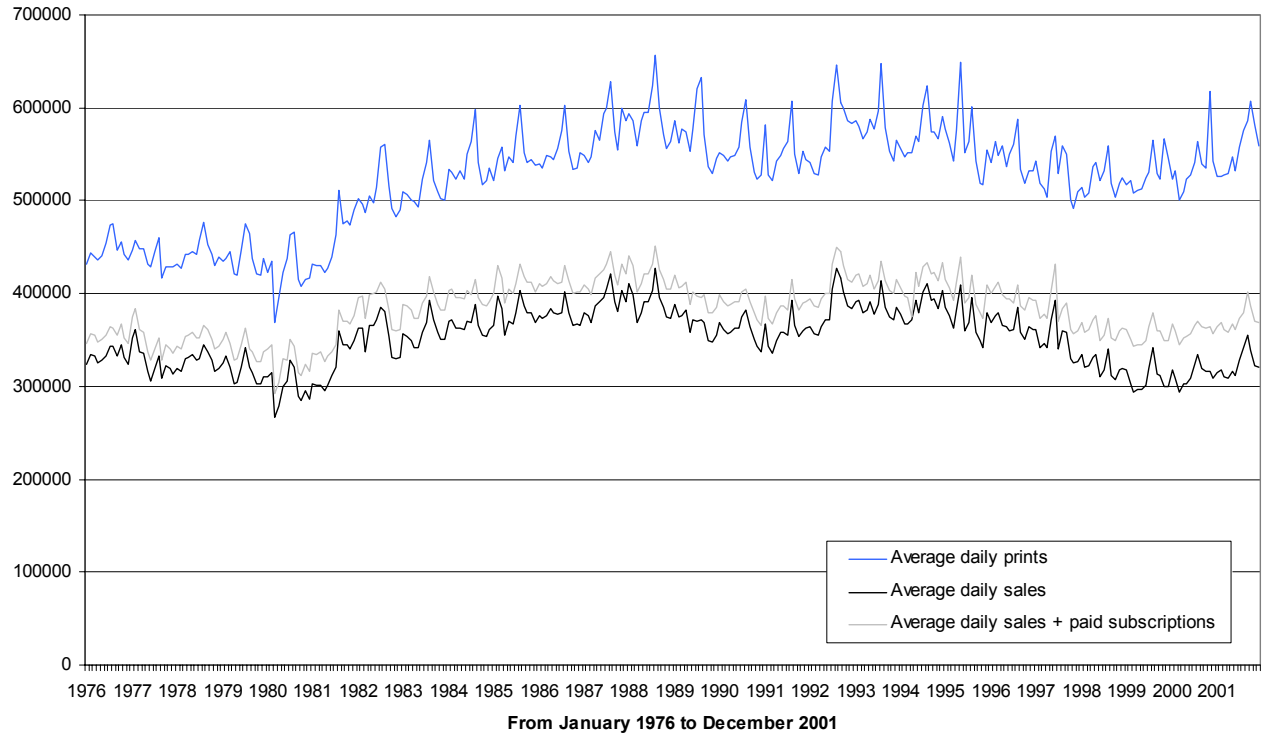
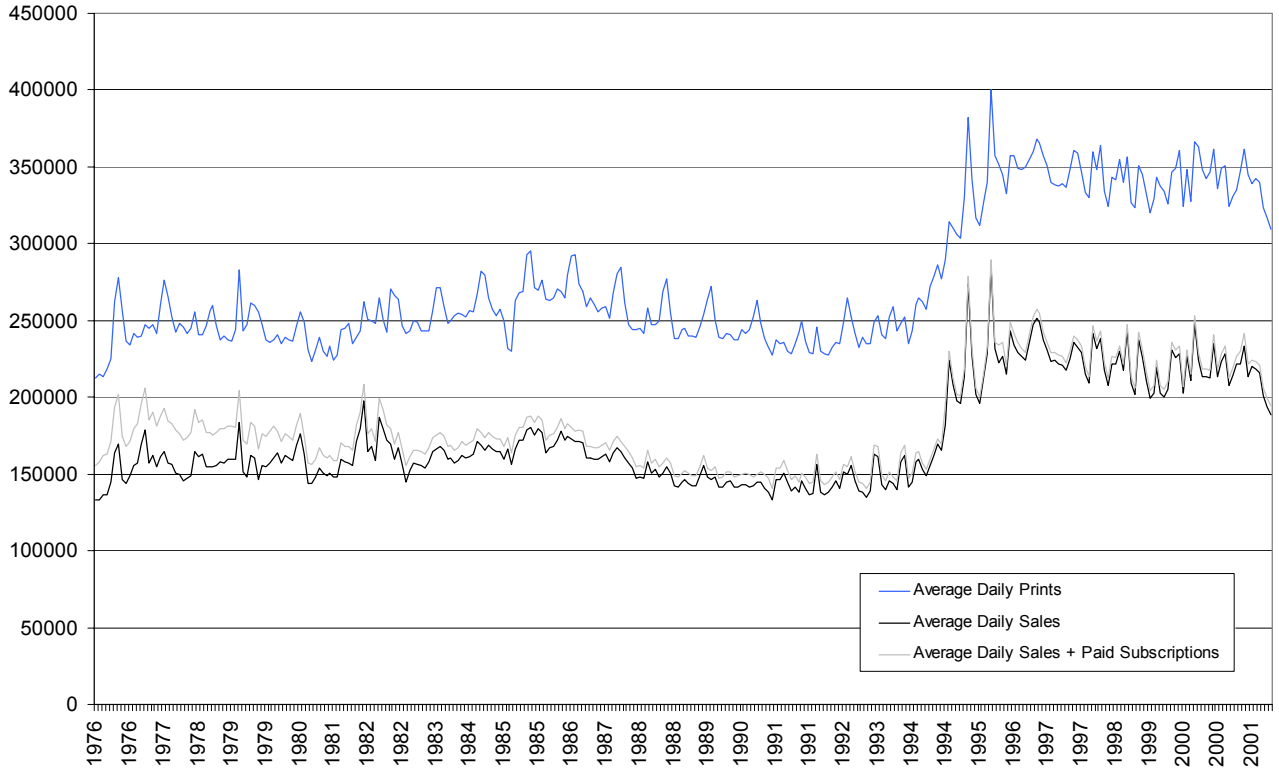


Figure 6 - La Stampa on paper



From January 1976 to December 2001

Figure 7 - Il Giornale on paper



From January 1976 to December 2001

6 – The model

In order to test for product substitutability, I model consumer choice among different newspapers as a choice for a differentiated product and derive a simple aggregate logit model of demand.

The starting assumption, which is common to fixed coefficients models of product differentiation in general, is the following functional form of consumer i indirect utility from reading newspaper j at time t in weekday d:

$$u_{ijtd} = \alpha(y_{it} - p_{jtd}) + \bar{x}_{jtd}\bar{\beta} + \xi_{jtd} + \varepsilon_{ijtd}$$

where y_{it} is the income of consumer i at time t, p_{jtd} is the price of newspaper j at time t in weekday d, $\bar{x}_{jtd}$ is a vector of observed characteristics, ξ_{jtd} is an unobserved (by the econometrician) characteristic, ε_{ijtd} is a mean-zero stochastic term, α is consumers marginal utility from income and $\bar{\beta}$ is a vector of taste coefficients.

Such an indirect utility specification assumes a quasi-linear utility function, free therefore of wealth effects, which sounds plausible for daily newspapers. It also assumes that both observed and unobserved product characteristics are the same across all individuals in the market and thus rules out both the possibility of different supplements, promotions and chronicles in different regions and of different prices for different consumers[20]. Finally, the marginal utility from income and the taste parameters are assumed fixed across consumers and, as a result, consumers heterogeneity enters only through the separable additive random shock ε_{ijtd}.

[20] Whereas there are in general no discounts in the price to consumers, not even for subscriptions, and local supplements and promotions are not frequent, local chronicles and bundling to local daily newspapers at an unchanged price are quite common. I discuss further the issue below.

As consumers may decide not to read any of the daily newspapers considered (or any newspaper at all), an outside good is introduced[21], consuming which yields to consumer i at time t in weekday d the indirect utility:

$u_{iotd} = \alpha y_{it} + \xi_{otd} + \varepsilon_{iotd}$.

Since the outside good is a composite one, its price and its characteristics are not defined. The price of the outside good is then assumed to be equal to zero[22] and all the characteristics are assumed to be unobservable[23] . But as ξ_{otd} is not identified, the standard practice is to set it equal to 0, which, as the term αy_{it} eventually vanishes because it is common to all products, is equivalent to normalizing the mean utility from the outside good to zero[24].

Consumers mean utility, δ_{jtd} from reading newspaper j at time t in weekday d is instead given by:

$$\delta_{jtd} = E_i[u_{ijtd}] = \alpha(y_i - p_{jtd}) + \bar{x}_{jtd}\bar{\beta} + \xi_{jtd}$$

Consumers are then assumed to purchase the newspaper which gives them the highest utility and to be never indifferent between buying one or another newspaper. That is it is assumed there are no ties.

For convenience, it also assumed that consumers do not choose more than one newspaper, although this behaviour can sometimes be observed. This assumption is common to most empirical studies on differentiated products markets, the usual justification being that

[21] In the absence of an outside good, the model would assume consumers to be forced to choose one of the newspapers. Therefore, it would assume that, if all newspapers opened a website at the same point in time, this would not influence the aggregate sales of all the newspapers, which would be unfortunate, since it would in fact amount to assuming that no substitution takes place between the paper and the on-line product.

[22] In other words, the consumer is assumed to be choosing between buying one of the above newspapers or not buying it, not between buying one of the newspapers above or buying something else. The decision of whether to buy something is not simultaneous.

[23] Or equivalently, both the price and the chracteristics are assumed to be unobservable and therefore included in ξ_{otd}.

[24] So that neither the marketshares of the outside good nor those of the inside goods respond to changes in the characteristics or in the price of the outside good, unless time fixed effects are used, as discussed below.

assuming otherwise is econometrically very cumbersome and the assumption is instead, at worst, a reasonable approximation. That's because multiple purchases, though by no means uncommon, are not a rule and in any case even if two products are bought together they are then often consumed at different times, so that the multiple purchase is just an organisational device.[25] Furthermore, if the potential market size is defined large enough, we might also claim that observed multiple purchases by the same individual are the result not only of his choice but also of somebody else's decision. In particular, if potential market size is defined as total population instead of number of households, the observation that an individual buys two newspapers might, at least to a certain extent, reflect the fact that he is buying one newspaper for himself and another for another member of his households who asked him to.

Decomposing $\xi_{jtd} = \xi_{jd} + \xi_t + \eta_{jtd}$, with η_{jtd} a random shock independent of ε_{ijtd}, allows me to model newspaper-day and time specific unobserved characteristics. If ξ_{jd} were considered as an unknown parameter specific to each product j in weekday d, this would lead to a fixed effects model. If instead ξ_{jd} were assumed to be a random variable with mean μ_ξ and variance σ_ξ, then we would have a random effects model. Given that the assumption of no correlation between the observed product characteristics and the unobserved product characteristics, which lies at the basis of the random effect estimation, does not appear plausible, I choose a fixed effect specification. This choice also allows me to better estimate product differentiation, as in this model the product fixed effects are usually believed to capture also the vertical component.[26]
An alternative decomposition would be $\xi_{jtd} = \xi_j + \xi_d + \xi_t + \eta_{jtd}$. Whereas substituting $\xi_j + \xi_d$ would allow to estimate only a newspaper fixed effect

[25] In this market, the latter justification is, however, weaker than usual, as newspapers become quickly old and buying two newspapers in the morning may even be equivalent to buying one newspaper in the morning and one in the evening, but very different from buying one today and one tomorrow.
[26] See Nevo(2001).

and a weekday fixed effect, thus identifying only separately the utility of reading a given newspaper and the utility from reading any newspaper in a given day of the week, the choice of a product-weekday fixed effect has the advantage of allowing a potentially different ranking of newspapers for each weekday, thus allowing vertical product differentiation to vary across weekday. What's more, given that newspapers' characteristics vary also across day of the week and that, as discussed below, they are not easy to identify and costly to observe, a more flexible use of fixed effects helps to identify the Internet effect.

The inclusion of time fixed effects is instead justified by the necessity to control for the change through time in the utility of the outside good. There are many reasons why the latter may change in time. As a result of the appearance of TV, video games, CDs, DVDs, Internet and, more generally, of alternatives to reading a newspapers[27], the characteritics and price of the outside good might change. But also changes in the average consumer taste may change the relative utility of the choice to buy the newspaper with respect to any of the activities included in the composite outside good. As its utility is by construction normalised to zero, the absence of time fixed effects or some equivalent control[28] would raise questions of identification for the estimated coefficients. Particularly so in the case of the website effect, which in my model is identified through a simple dummy variable.

However, controlling for changes in the utility of the outside good also defines the substitution effect measured by the website dummy variable. In as much as it is possible to assume that the general availability of news on line has the same negative impact on the marketshares of all the newspapers in the sample, the substitution effects 1) and 2) discussed above will be captured, among many other

[27] See Censis(1961-2002) and Censis(2001).

[28] An alternative to time fixed effects is the use of a polynomial trend (Argentesi 2004) or year and month fixed effects (Kaiser 2003). The time fixed effects are however more flexible and offer a better control.

things, by the time dummy variables. As a result, the coefficient on the website dummy variable will measure only the substitution effect 3), that is will capture the loss in marketshare of a traditional newspaper due to people who shift to reading the same newpaper website.

We then assume that ε_{ijtd} is i.i.d. across consumers and products and that it is distributed according to a type I extreme value distribution. Assuming ε_{ijtd} to be i.i.d. across consumers rules out, in particular, the possibility that individual specific random shocks are correlated across products or equivalently only allows shocks to demand to be correlated across products if they are not individual specific

All the assumptions above lead to an aggregate logit model. In fact in this model, at a given point in time t in a given day d, each individual i is defined by a vector of random shocks $\bar{\varepsilon}_{itd} = (\varepsilon_{i0td}\ \varepsilon_{i1td}\ \ldots\ \varepsilon_{iJtd})$. As a result, the set of individuals who choose product j at time t in weekday d is implicitly defined as

$$B_{jtd}(X_{td}, \bar{p}_{td}, \bar{\xi}_{td}, \alpha, \bar{\beta}) = \{\bar{\varepsilon}_{itd} \mid u_{ijtd} \geq u_{iktd} \vee_{k \neq j}\}$$

where

$$X_{td} = (\bar{x}_{1td}, \ldots, \bar{x}_{Jtd}),\ \bar{p}_{td} = (p_{1td}, \ldots, p_{Jtd}) \text{ and } \bar{\xi}_{td} = (\xi_{1td}, \ldots, \xi_{Jtd})$$

The market share of product j at time t in weekday d is therefore given by:

$$S_{jtd}(X_{td}, \bar{p}_{td}, \bar{\xi}_{td}, \alpha, \bar{\beta}) = \text{Prob}\{u_{ijtd} \geq u_{iktd} \vee_{k \neq j}\} = \int_{B_{jtd}} dP_{\varepsilon}$$

which leads to

$$s_{jtd} = \frac{\exp(\delta_{jtd})}{1 + \sum_{k \neq 0} \exp(\delta_{ktd})} \text{ for any newspaper j}$$

and

$s_{0td} = \frac{1}{1 + \sum_{k \neq 0} \exp(\delta_{ktd})}$ for the outside option[29].

It should be noted that the presence of an outside good with market share s_{0td} means that observations of newspapers sales are not sufficient to calculate market shares. As a result it is necessary to introduce the concept of potential market size as distinct from the observed market size which would simply be the sum of national newspapers sales. Thus the definitions of market size and market shares are different from the ones commonly used. Potential market size can either be assumed or estimated by parameterising it as depending on some market level data (such as population) which vary across time. Here, as discussed below, I chose to assume potential market size is equal to population above 14 years of age[30].

For any given characteristic which is expressed by a continous variable x its own and cross marginal effects on market shares are:

$$\frac{\partial s_{jtd}}{\partial x_{jtd}} = \beta (1 - s_{jtd}) s_{jtd}$$

and

$$\frac{\partial s_{jtd}}{\partial x_{ktd}} = -\beta s_{ktd} s_{jtd} \text{ with } k \neq j.$$

So that the own and cross elasticities of the market shares with respect to that characteristic are respectively:

$$\eta_{jjtd} = \frac{\partial s_{jtd}}{\partial x_{jtd}} \frac{x_{jtd}}{s_{jtd}} = \beta x_{jtd} (1 - s_{jtd})$$

and

$$\eta_{jktd} = \frac{\partial s_{jtd}}{\partial x_{ktd}} \frac{x_{ktd}}{s_{jtd}} = -\beta x_{ktd} s_{ktd} \text{ with } k \neq j.$$

[29] Note that the term αy_{itd} drops out as it is common to all options.
[30] An alternative would be using the number of households.

The model thus predicts a different demand, different marketshares and therefore different marginal effects and elasticities for each time t and each weekday d.

If the chracteristic is instead a dummy variable the derivatives and elasticities above are not defined. However, defining $\delta_{jtd}(1)$ as δ_{jtd} when x=1 and defining $\delta_{jtd}(0)$ as δ_{jtd} when x=0, the own effect of the characteristic can be calculated as

$$\frac{\Delta s_{jtd}}{\Delta x_{jtd}} = \frac{\exp(\delta_{jtd}(1))}{1+\sum_{n\neq 0,J}\exp(\delta_{ntd}(0))+\exp(\delta_{jtd}(1))} - \frac{\exp(\delta_{jtd}(0))}{1+\sum_{n\neq 0}\exp(\delta_{ntd}(0))}$$

for any newspaper j , while the cross effect of the characteristic is

$$\frac{\Delta s_{jtd}}{\Delta x_{ktd}} = \frac{\exp(\delta_{jtd}(0))}{1+\sum_{n\neq 0,k}\exp(\delta_{ntd}(0))+\exp(\delta_{ktd}(1))} - \frac{\exp(\delta_{jtd}(0))}{1+\sum_{n\neq 0}\exp(\delta_{ntd}(0))}$$

for any newspaper j and

$$\frac{\Delta s_{otd}}{\Delta x_{ktd}} = \frac{1}{1+\sum_{n\neq 0,k}\exp(\delta_{ntd}(0))+\exp(\delta_{ktd}(1))} - \frac{1}{1+\sum_{n\neq 0}\exp(\delta_{ntd}(0))}$$

for the outside option.

As it is well-known to the empirical IO literature[31], the use of an aggregate logit model to estimate demand places restrictive assumptions on own and cross price elasticities or equivalently on own and cross marginal effects of price. The same restrictions are placed on the marginal effects and elasticities with respect to any characteritic which is measured as a continous variable.

In particular, two newspapers with the same market shares will have the same own derivative and also the same cross derivative with respect to any third newspaper. In addition cross derivatives are symmetric. So that conditional on market shares, own and cross elasticities depend only on the characteristic which changes, while in addition all

[31] See for instance Berry(1994), Berry et al. (1995) and Nevo(2000)

newspapers have the same elasticity of demand with respect to any given newspaper.
That's because additive separability together with the i.i.d. structure of the random shocks, when the amount of a positive (negative) characteristic of one newspaper is raised (decreased), requires consumers to substitute towards other newspapers in proportion to market shares, regardless of the other newspapers characteristics[32].
The same restrictions extend of course to the case of a characteristic measured as a dummy variable.

Whereas the restrictions on own and cross price derivatives and elasticities do not appear to be too much of a problem in this case as I am not directly interested in the effect of price, those on the effects of product characteristics are potentially more problematic. In general, as I argued above, I chose to restrict my analysis to a sample of newspapers, which although differentiated, is quite homogeneous, so that assuming substitution to take place on the basis of marketshares is likely to be a good approximation. Yet even in this context it raises some concerns with respect to the substitution towards the outside good.
In fact, when using, as potential market size, the population above 14 year of age, the highest market share is the one of the outside good[33]. As a result, for any increase in a product characteristic which provides positive (negative) utility, most of the consumers are assumed to substitute from (towards) the outside good.
However, the characteristic I am interested in is the availability of a website. Then, if a daily newspaper publisher opens a website and there is substitution away from the paper edition of that newspaper, the assumption that most people do not substitute towards other national newspapers but rather substitute towards the composite outside good is not at all restrictive, as in this case the outside good includes the choice of reading news on-line.

[32] See Berry(1994) and Nevo(2000)

7 – Estimation

Dividing each newspaper market share by the outside good market share, simplifying and taking natural logarithms leads to the following market shares estimation equation:

$$\delta_{jtd} \equiv \ln(s_{jtd}) - \ln(s_{otd}) = \bar{x}_{jtd}\bar{\beta} + \alpha p_{jtd} + \xi_{jd} + \xi_t + \eta_{jtd}$$

Potential total market size was defined as total Italian population above 14 years. This is the usual potential readers definition in studies on newspapers consumption[34]. As estimates of population were available only for the beginning or the end of each year, the data were interpolated linearly to get monthly observations[35].

Market shares s_{jtd} were thus calculated as the number of sales of newspaper j at time t in weekday d over total Italian population above 14 years of age at time t[36]. As discussed above, average daily sales in each weekday in each month were calculated multiplying the average daily prints in that weekday by the ratio of average daily sales to the average daily prints in that month. Since for some years and for some daily newspapers the prints (and sales) of the daily newspaper when bundled to the supplement were recorded separately by ADS, average daily sales and average daily prints by month were calculated by averaging with weights given by the effective number of issue reported by ADS, whereas average daily prints by weekday in each month were obtained with weights given by the number of each weekday in the month[37].

The outside good market share was calculated as $s_{otd} = 1 - \sum_j s_{jtd}$. Clearly it enjoyed the highest market share.

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[33] This would be true even if I used the number of households as potential market size.
[34] See Fieg(1982-2002), Censis(1961-2002) and also Kaiser(2003).
[35] Results however do not change if average daily prints for each weekday in a month are used as the dependent variable.
[36] Total market size was assumed constant across different weekdays in a month.
[37] That is they were calculated disregarding strikes, as if the newspapers had always been sold when they were supposed to be. Official days in which newspapers are not sold due to holidays were instead considered.

Average nominal prices for each weekday in each month were obtained by averaging over the official nominal prices of the newspaper with weights given by the number of each weekday in the month[38]. Average real prices were then obtained dividing average nominal prices by the Italian monthly CPI[39]. Although they are usually recognised as endogenous and instrumented, I did not instrument prices. Given the already discussed lack of price competition among newspapers in Italy, I claim they can be considered exogenous or at least predetermined. It is a common assumption in discrete choice models of product differentiation to assume that product characteristics are exogenous or predetermined[40]. Given the evidence provided above, there is no reason to believe prices too cannot be considered exogenous or predetermined in this case.

All characteristics included in x_{jtd} were dicotomous and had to be introduced as dummy variables. All of them however changed across time and product. They included dummies for supplements[41] (both of generalist and women's kind[42]), for having a Monday issue[43], for newspaper editors as a proxy for editorial line (some of them switched from one newspaper to the other during the period under consideration), and for games of the "lotto" kind played simply and only by buying the

[38] See note above.
[39]
[40] See for instance Nevo(2001) or Brenkers & Verboven(2001).
[41] In particular, I control for the effect of the supplement on the day it is issued but also for the promotional effect on the other days of the week.See Argentesi(2004)
[42] Women's supplements are Io Donna for Corriere della Sera and D-Donna della Repubblica for La Repubblica. Generalist supplements are instead Il Venerdì of La Repubblica, Sette of Corriere della Sera and Specchio of La Stampa. The day in which they are issued has for some of them changed through time.
[43] La Repubblica started to have a Monday issue in January 1994, La Stampa in January 1992 (though there was a Monday issue of La Stampa Sera up to December 1991, when this evening edition of La Stampa ceased to be published) and Il Giornale in January 1980.

newspaper. I also included the variable number of local chronicles or of bundling to a local newspaper[44].

Finally, as already mentioned, newspaper-weekday fixed effects were used as well as time fixed effects.

Estimating the equation above as it is leads to substantial autocorrelation in the residuals, but it should not come as a surprise. The main source of shocks to demand in the market for daily newspapers can be expected to be news itself. Since some events take place either in more than one month or in between two of them, the error term η_{jtd} might be autocorrelated. If so, the autocorrelation due to news could probably be assumed to be of order one and common to all newspapers.

Yet, there is also another potential source of autocorrelation: the omission of dynamics. Figure 1 above clearly shows that dynamics is relevant, at least in order to explain the diffusion of *La Repubblica*. Dynamics in our model can be due to the presence of consumer habits[45] and/or the existence of consumption externalities, the latter affecting either consumers evaluation of the product (that is the indirect utility of consuming it) or consumers knowledge about the product (that is the choice set). In any case aggregate market shares today would not only be a function of newspapers characteristic and random shocks today, but also of market shares yesterday. Similarly for the ratio of any newspaper market share with respect to the outside good.

I thus estimated the equation above also with the inclusion of lags of the dependent variable, instead of or in addition to an autocorrelated random shock, as adding lags of the dependent variable is the usual way

[44] Its use is however not fully consistent with the utility maximization framework at the basis of the aggregate logit model as such a number is by definition a characteristic of the newspaper that not all consumers in the market enjoy. The same applies to using the dummies for each local chronicle as a characteritic, with additionally the loss in degrees of freedom due to adding other 49 explanatory variables.

[45] Dewenter (2002a) finds evidence of myopic habits formation while rejecting rational addiction in the market for newspapers in Germany.

to take dynamics into account when estimating a structural model of demand which starts from the specification of an aggregate demand equation.This specification is however not fully consistent with the utility maximization framework at the basis of the aggregate logit model[46].

I estimate the model above by simple OLS. As discussed by Nickell (1981), including lags of the dependent variable, or more generally predetermined variables, in a fixed effects model leads to estimates which are inconsistent for n $\rightarrow\infty$ but consistent for t $\rightarrow \infty$. Given that in our case n=28 & t=312 the relevant asymptotics should be that for t $\rightarrow \infty$, so that OLS estimates should be consistent.

Finally, I use results from the estimation to calculate measures of the short-run and long-run website effect on the marketshares and thus on the number of copies sold by each of the daily newspapers in the sample.

If one lag of the dependent variable is introduced, the estimation equation, becomes

$$\ln(s_{jtd} / s_{otd}) = \rho \ln(s_{jt-1d} / s_{ot-1d}) + \bar{x}_{jtd}\bar{\beta} + \alpha p_{jtd} + \xi_{jd} + \xi_t + \eta_{jtd} .$$

Then the ones above are short-run effects, whereas the long-run own effect of the characteristic can be calculated as

$$\sum_{s=t}^{+\infty} \frac{\Delta s_{jsd}}{\Delta x_{jtd}} = \left(\frac{\exp(\delta_{jtd}(1))}{1 + \sum_{n\neq 0,J} \exp(\delta_{ntd}(0)) + \exp(\delta_{jtd}(1))} - \frac{\exp(\delta_{jtd}(0))}{1 + \sum_{n\neq 0} \exp(\delta_{ntd}(0))} \right) \frac{1}{(1-\rho)}$$

for any newspaper j , while the long-run cross effect of the characteristic is

[46] Usually, the problem is not recognised in the empirical literature on discrete choice models of product differentiation, which treats observations on the same market at different points in time as observations of different markets. See for instance Nevo(2001) & Brenkers&Verboven(2001). Whereas the issue might not be relevant in a market for durable goods such as automobiles, where those who buy in period t are not likely to buy again in period t+1, it certainly is an issue in a market for non durables,

$$\sum_{s=t}^{+\infty} \frac{\Delta s_{jsd}}{\Delta x_{ktd}} = \left(\frac{\exp(\delta_{jtd}(0))}{1 + \sum_{n \neq 0,k} \exp(\delta_{ntd}(0)) + \exp(\delta_{ktd}(1))} - \frac{\exp(\delta_{jtd}(0))}{1 + \sum_{n \neq 0} \exp(\delta_{ntd}(0))} \right) \frac{1}{(1-\rho)}$$

for any newspaper j and

$$\sum_{s=t}^{+\infty} \frac{\Delta s_{osd}}{\Delta x_{ktd}} = \left(\frac{1}{1 + \sum_{n \neq 0,k} \exp(\delta_{ntd}(0)) + \exp(\delta_{ktd}(1))} - \frac{1}{1 + \sum_{n \neq 0} \exp(\delta_{ntd}(0))} \right) \frac{1}{(1-\rho)}$$

for the outside option.

8 – Results

Results from the OLS estimation are reported below in Table 5 below.

In an aggregate logit model the estimated parameters are the taste parameters in the indirect utility function, which are assumed not to vary across consumers. Therefore a negative (positive) coefficient indicates that a given characteristic of the newspaper brings disutility to the reader. But of course it also implies that the characteristic taken into consideration had a negative (positive) impact on the newspaper marketshares.

The coefficient for the availability of a website has a negative sign and is significant. Therefore the availability of a website decreases mean consumer utility from reading that newspaper, as it appears to have had, in general, a negative impact on its market shares. If it is so, daily newspapers and their websites are to be understood as substitutes rather than complements or independent goods.

Table 5 – Logit estimates of taste parameters[47]

Explanatory variable	Coefficient (standard error)
Website	-.0267231***

such as newspapers or cereals, where multiple purchases in time by the same consumer can be expected to be the rule rather than the exception.

[47] Estimated coefficients and standard errors for editors dummies, newspaper-weekday and time fixed-effects are not reported.

	(0.0076229)
Real price	-0.0000333**
	(0.0000153)
Games	+0.326721***
	(0.0046587)
Generalist supplement	+0.0372272***
(day of issue)	(0.009655)
Women's Supplement	+0.0211583*
(day of issue)	(0.0115915)
Generalist supplement	+0.0841162***
(all days)	(0.0062766)
Women's Supplement	+0.0077284
(all days)	(0.0098966)
ρ	+0.8824851***
	(0.005072)

dependent variable ln $\ln(s_{jtd} / s_{otd})$; *** 1% **5% * 10%;
number of observations: 8160; number of regressors: 365

More generally the estimated model appears to be well specified. The coefficient for real price, though small in size, is negative and significant at a 95% confidence level. The bundling of weekly generalist magazines to some of the newspapers appears to have had a positive impact on marketshares both on the weekday of issue and on the other weekdays, whereas the bundling of weekly women magazines does not appear to have had any effect[48]. Finally, the possibility to play games such as Lotto simply and only by buying a copy of the daily newspaper appears to yield a positive utility to consumers and therefore to have had a significant positive impact on newspapers marketshares.

From the estimated taste parameters, using the formulas reported above, I calculate the own and cross effect in number of copies sold of the decision to go on-line for *Corriere della Sera*, *La Repubblica* and *La Stampa*.

[48] See Argentesi(2003).

Table 6 – Short-run own and cross effects of website (number of copies sold)

Effect of (row) on (column)	**Corriere della Sera**	**La Repubblica**	**La Stampa**	**Il Giornale**	**Outside Good**
corriere.it	-16 537	+192	+110	+75	+16 160
	(1702)	(38)	(14)	(10)	(1649)
repubblica.it	+192	-15 011	+100	+68	+14 652
	(37)	(1649)	(15)	(10)	(1595)
lastampa.it	+115	+105	-8 954	+41	+8 694
	(18)	(19)	(963)	(6)	(934)

standard deviations in parenthesis

Table 7 – Long-run own and cross effects of website (number of copies sold)

Effect of (row) on (column)	**Corriere della Sera**	**La Repubblica**	**La Stampa**	**Il Giornale**	**Outside Good**
corriere.it	-140 724	+ 1 638	+936	+636	+137 514
	(14 480)	(324)	(120)	(86)	(14 030)
repubblica.it	+ 1 632	-127 737	+849	+576	+124 680
	(316)	(14 033)	(125)	(82)	(13 572)
lastampa.it	+ 977	+ 894	-76 198	+ 347	+73 979
	(153)	(159)	(8198)	(54)	(7944)

standerd deviations in parenthesis

Table 6 reports the short-run effects on sales, whereas the long-run effects are reported in Table 7. The opening of an own website is estimated to have caused a short-run loss in sales of 16527 to *Corriere della Sera*, of 15001 to *La Repubblica* and of 8949 to *La Stampa*. These losses are on average approximately 2.6% of their sales. The estimated long-run losses are instead 140638, 127659 and 76151 respectively, on average approximately 22.7% of their sales. By assumption most of these losses come to the advantage of the outside good.

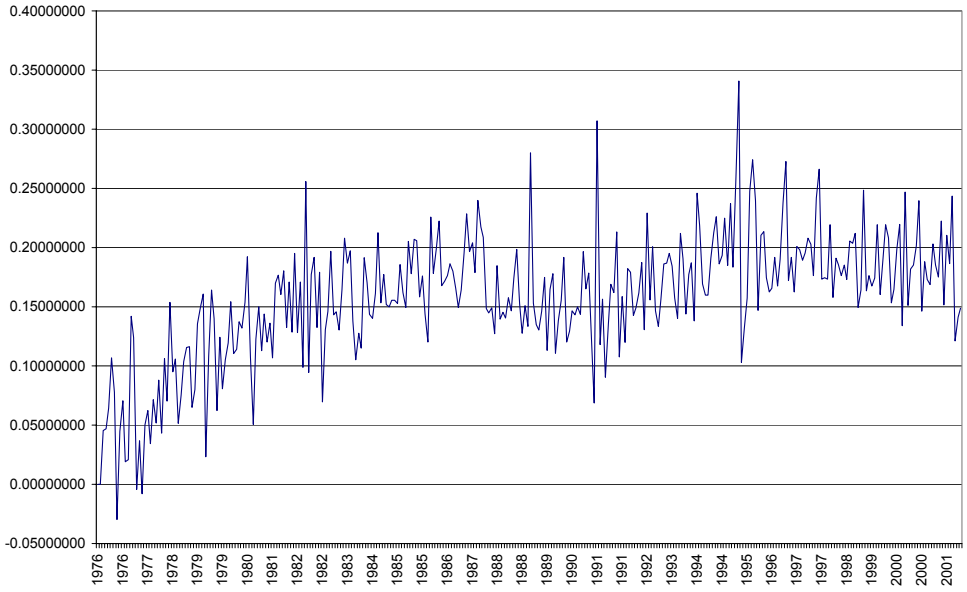
These effects are substantial. Yet they are not inconsistent with the number of on-line newspaper readers estimated by other sources. Let us

consider for instance the number of pagevies according to the data reported in Figure 2. Their average for *La Repubblica* over the period January 1999 to December 2001 is 833 570 a day. Our estimate for the number of readers who switched to on-line reading is 14 627. Only if we assumed that an on-line reader reads on average more than 56 pages a day would our estimate be inconsistent with these data. The average daily pageviews for *Corriere della Sera* between January 2000 and December 2001 is instead 553 205. Our estimate is 15 965 Only if we assumed that an on-line reader reads on average more than 34 pages a day would it be inconsistent with the observed pageviews. Finally, the average daily pageviews for *La Stampa* in the period September 2000-April 2001 is 345 145. Only if we assumed that an on-line reader reads on average more than 40 pages a day would our estimate of 8573 be inconsistent with the observed pageviews. But for instance, according to data from OnetOne Research, the average number of pages of corriere.it repubblica.it or lastampa.it viewed by an on-line surfer in the period november 2000-november 2001 was never more than 41 in a month.

As discussed above, thanks to the use of time fixed-effects, in as much as it is possible to assume that the general availability of news on line has the same negative impact on the marketshares of all the newspapers in the sample, the ones reported in Tables 6 and 7 are the estimated losses in sales of a traditional newspaper due to people who shift to reading the same newpaper website. I cannot instead identify the substitution effects 1) and 2), that is those due either to people allocating less time to reading (and thus not buying newspapers) in order to surf or to people not buying newspapers as they prefer to read news via Internet; they are however captured, among many other things, by the time dummy variables. Figure 8 shows a graph through time of the estimated time fixed effects. Although in the whole sample period they are not a monotonic function of time, they appear to have been declining in the last few years, just as internet news have been

growing[49]. The implied increase in the utility of the outside good might thus be due to the appearance of Internet.

Figure 8 - Time fixed effects



9 - Conclusions

All in all, Internet appears to have had a negative impact on the level of the market shares of the four main national newspapers in Italy.

Possible explanations for why traditional newspapers publishers opened websites and even put on line for free the exact content of the paper edition could be the expectation to be able to raise advertising revenues that compensate or more than compensate the costs of on-line publishing and the loss in paper sales, the attempt to establish a position in a new market or to build up consumers loyalty, especially among young people, in the expectation of a shift of news consumption from paper to world wide web and with the objective to set a fee for newspapers on-line once succeeded in building this position or consumer loyalty.

[49] A simple OLS regression of time fixed effects on a time trend after the introduction of the first website in the sample gives a negative, albeit insignificant, coefficient of -

Whereas not necessarily one only of the above reasons is the relevant one, all of them are compatible with the observation that *La Repubblica* set up a fee for reading on line the paper edition from January 2002, five years after the first opening of the website, and that its example was soon followed by both *Corriere della Sera* and *La Stampa*.

Some issues left open by this paper suggest lines for further research on the topic.

First, I have here assumed that the utility from reading the website is constant through the period the website is available and thus I estimated an average effect of an own website on newspaper marketshares. Yet the utility of the mean consumer from reading the website might change as more features are added to the website, as more people have internet access and/or as the average speed of connection to internet increases. Introducing these and possibly other sources of dynamics in the website effect might show the underlying time trend of the impact of Internet and help to calculate not only a more precise short run effect for each point in time but also a more reliable long run effect.

Second, the model has been estimated under the implicit assumption that all newspapers websites are perceived to be of the same quality by newspaper readers. Relaxing this assumption might provide interesting results on the relative success of the websites.

Third, the sample of newspapers taken into consideration could be extended, to include other categories of daily newspapers, such as sport or business ones. But in this case the logit model might have to be dropped in favour of the more general nested logit model or random coefficients model or even better in favour of a model which allowed for the possibility of complementarities between products even when using market level data.

0.0003049 (standard error +0.0002128).

Although we do not expect the extensions above to substantially change the results above, we believe they might provide further hindsight regarding the negative impact of news on line on the traditional market for daily newspapers.

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