# Entry and Competition in Local Newspaper Retail Markets - When two are enough

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## *When two are enough*

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**JEL-codes: D43, L1, L41, L51, L9**

***Abstract:***

This paper estimates sustainable coverage and competitive effects of entry for Swiss newspaper sellers which sell composite goods, including a range of other products such as food and near-food items. It utilises the applied entry threshold ratio methodology from Bresnahan and Reiss (1991), which allows estimation even when the range of products under examination is not exactly defined and when price and quantity data are not available. It is found that under monopoly pricing, single firm entry is sustainable in communes with a market size of over 482 people (leaving 310 Swiss communes without a selling point). With duopoly prices, instead, a first firm would only be able to enter a market with 921 people (leaving another 263 communes, corresponding to 2,1% of the population, without coverage). There are therefore tangible benefits from above duopoly prices in monopoly regions. Thus, a clear and quantifiable trade-off between prices in monopoly regions and coverage exists. Moreover, it is found that a second entrant in this market strongly increases competition, while further entry doesn't have significant additional competitive effects. From a welfare perspective, therefore, "two is enough" to ensure competition in this market. It is shown that this is not the case in some other retail markets, where entry by a third firm may significantly affect competition. Finally, using the estimation results, it is show that the public policy, which consisted of having the government controlled Swiss Post enter the newspaper sellers' retail market, was not optimal as it was focused on urban areas where neither coverage nor competition could be enhanced, while risking competitive distortions. At the same time, it is shown that there are communes in which such a government policy may be welfare enhancing.

# 1. Introduction

This paper estimates sustainable coverage and competitive effects of entry for Swiss newspaper sellers which sell composite goods, including a range of other products such as food and near-food items. It is found that when communes are not too small, the presence of one or more newspaper selling points can be sustained by the free market. Moreover, the effect of a second entrant on competition is shown to be strong, while subsequent entry does not have further significant impact on competition. This result is important, as there was repeated direct public intervention in local newspaper sellers' markets (by the Swiss Post) which are shown to be competitive. Moreover, it is shown that the market dynamics on the distribution market may also affect upstream competition between newspaper publishers, as, for instance, in the absence of local sales channels entry barriers are increased.

The media is often called the fourth[1] of Montesquieu's three powers of the state and a founding pillar of modern democracy (Montesquieu (1751)). People like Alain Peyrefitte and Thomas Jefferson argued that a society needs freedom of speech and the freedom of press[2] to ensure checks and balances between the people and the three traditional powers. In Switzerland, for instance, freedom of the press seems to be granted in general by the legal, political and economic framework. Freedom House ranks Switzerland respectively fourth, third and fifth in the world (Freedom House, 2012). In this setting legal freedom of the press alone is, however, not a sufficient condition for efficient public information. It is recognised that the press in general has the ability to influence the public opinion. This can occur through a topic selection bias, e.g. by omitting relevant information or by publishing biased information. Sufficient competition between journals might provide for optimal horizontal differentiation (Salop, 1979), leading to a homogeneous coverage of all topics "requested" by readers – and eliminating to a large extent a possible topic selection bias or biased opinions in the industry as a whole. Bignon and Miscio (2010) show that competition between newspapers produces coverage of all relevant information in the market. (Blasco & Sobbrio, 2012) show that a sufficiently high degree of competition in the market for newspaper drives out possible media biases also in relation to particular interests of advertisers and review relevant literature. Freedom House notes that in practice, despite a good overall ranking, the situation in Switzerland is not unproblematic as large publishing houses control most of the print sector and that concentration of ownership has forced many stand-alone newspapers to merge or shut down. A lack of competition implying a local informational bias might therefore potentially represent a democratic challenge. Such an issue might be particularly relevant in Swiss regions (cantons) and communes where political decisions are regularly put at vote[3].

In addition to freedom of the press and competition between publishers, accessibility also matters. The public should be able to access information without unreasonable effort. In rural areas, for example, if there are no newspaper selling points in the commune, it may be difficult for a citizen not subscribed to a newspaper to find a newspaper to buy nearby. This article analyses under which circumstances entry and therefore coverage is viable. It is concluded that only in 310 from 2'700 communes (corresponding to 1% of Swiss population) no selling point is economically viable. Moreover, the impact of entry on monopoly, duopoly and oligopoly newspaper seller markets in Swiss communes is assessed. An entry threshold model based on Bresnahan and Reiss (1991) is used to estimate

[1] The idea of the Fourth Power is not explicitly found in Montesquieu. It appears during the first part of the 19th Century in writings Thomas Carlyle (Carlyle, 1993) citing British politician Edmund Burke (1729-1797). Carlyle and others as Macaulay coined the expression Fourth Estate to describe an informational power, which included the political reporters of the Press, but also, in a larger sense, all writers and the entire institution of literature. In modern times the fourth branch or power has a meaning which includes other mass media such as TV and radio.

[2] Jefferson (1787): "The basis of our government being the opinion of the people, the very first object should be to keep that right; and were it left to me to decide whether we should have a government without newspapers, or newspapers without a government, I should not hesitate a moment to prefer the latter."

[3] More concretely, a citizen of the commune of Zürich needs to be able to participate at votes on four dates per year on 25 law proposals often very different in their nature and at a general election. This requires a large and broad amount of local information in order to be able to make sufficiently informed choices.

minimum demand levels necessary for entry of a specific number of firms as well as the impact of entry on newspaper sellers average variable profits. Most importantly, these estimates show that in communes with only one newspaper seller, there are considerable margins, while margins are strongly reduced when a competitor enters (considering their full product portfolio). Entry by subsequent competitors is shown to have no significant further effects on margins. It is shown that this is a particular feature of the Swiss newspaper sellers' market and that in different other retail markets entry of a third firm also has substantial competitive effects. While the high profitability of monopoly selling points may be seen by some as a problem, it is argued that it has also a positive effect, increasing the geographical coverage of newspaper selling points. More concretely, it is shown that when a monopolist would be able to charge only duopoly prices, coverage would be lost in 263 communes (2,1% of the population). There are therefore tangible benefits from above duopoly prices and a clear and quantifiable trade-off between prices in monopoly regions and coverage exists. For a detailed theoretical model regarding the interplay of local competition, investment and coverage with two firms and increasing fixed costs towards rural areas, the reader may refer to Bourreau, Cambini and Hoernig (2012). Unlike newspapers, the availability of other media like TV, Radio or the Internet is usually largely independent from geographically located intermediaries. Nevertheless, coverage matters, especially for broadband Internet where coverage is not available in some rural areas. Such other forms of media will be shown to not represent valid substitutes to newspapers (not sufficient in-depth information) to date. In addition, local radio and TV stations are often not available in rural areas. The impact of other forms of media is therefore largely abstracted from in the model.

It is additionally argued in this article that the relatively strong margin earned by monopoly newspaper selling points over the whole range of products sold, may not only be beneficial to accessibility, but may also correspond to increased competition between newspaper publishers. Regarding this second effect, Shapiro and Varian (1999) show that newspapers (and information services in general) are *experience goods*; consumer must experience them to value them. To be able to efficiently compete, firms must therefore offer consumers a way to easily experience the good before committing to a subscription. The easiest way to experience a newspaper is usually to buy a single copy at a selling point. While newspaper selling point sales may well have a lower weight than subscription sales when considering total sales of publishers, they may play a crucial role during entry for acquisition of customers, and be a prerequisite for effective competition between newspapers. If all newspaper selling point sales channels in an area were to disappear, this would clearly increase experience costs (and entry barriers) and therefore correspond to less upstream competition between editors. Concretely, for instance, it might be very difficult for a new small local newspaper to gain a customer base in rural area, where nearly no selling points are available. Paradoxically, high (overall) retail profitability of newspaper selling points can therefore increase total coverage (accessibility) and thereby competition between editors[4] (reducing informational bias) - potentially benefiting the public in two distinct ways. These benefits do, however, not come without a cost, which may be mainly related to relatively higher prices of the whole portfolio of goods sold by newspaper sellers in areas with limited competition.

This paper consists of a series of chapters laying down a theoretical model, adjusting it to the case under analysis and analysing econometric results. Chapter 2 describes the market environment in newspaper distribution as well as publishing markets in Switzerland. In Chapter 3, the current public policy in place will be described. Chapter 4 describes the theoretical model used in this paper and Chapter 5 its practical econometric adaption to the Swiss newspaper sellers market. Subsequently, Chapter 6 describes the data used. Chapter 7 summarizes regression results and as well as minimum

[4] It should be noted here that competition at wholesale level is not generally independent of retail competition. Inderst and Valletti (2007) show how retail competition affects wholesale competition via indirect effects. In practice an upstream supplier may be unable to raise (upstream) prices substantially above competitive levels as this would make its retailers less competitive and customers may switch to retailers of the competitor. This may be the case when there are different wholesale suppliers or a vertically integrated firm. Here, as will be shown, there is a publishing-wholesale distribution monopoly supplying inputs to all retailers. In such case there are no indirect effects.

demand levels necessary for entry (entry thresholds). In addition, entry threshold ratios, indicating the effect of entry on profitability are calculated. Finally, Chapter 8 makes policy recommendation based on these results and Chapter 9 concludes.

# 2. Market environment

The newspaper distribution market is part of a complex system of up- and downstream markets (Figure 1). Generally, there is a two-sided newspaper market where readers buy newspapers and read them and an advertising market were advertisers buy advertising space in these newspapers (higher readership is typically associated with higher prices). Newspapers are then distributed in two different ways: one is distribution through the subscription channel where copies are sent to a home address of the customer and distribution through newspaper selling points, where usually there are wholesalers and retailers involved. These markets and their relationships are described in the following sections.

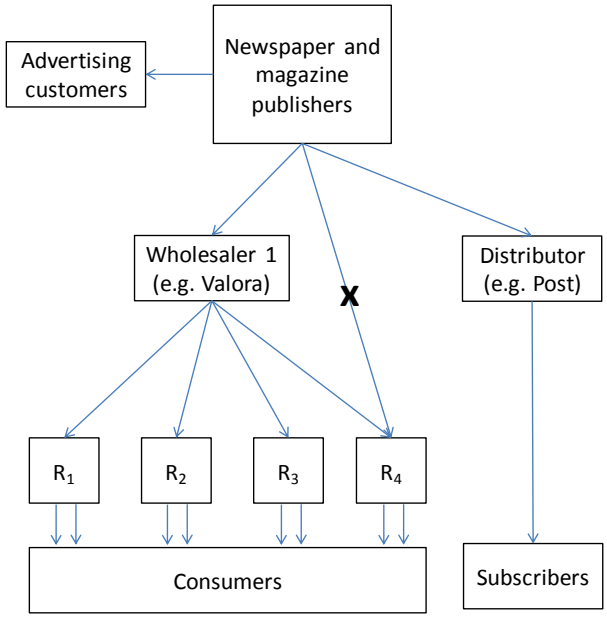



**Figure 1 - Dependencies between the players in the newspaper value chain (OFT, 2009)**

On the reader market side, publishers compete to supply newspapers to consumers by charging a cover price for print copies (whether distributed singly, over the counter, or by subscription). On the other side of the market, both free and non-free newspapers compete for advertising revenues.

***Possible media substitutes***

In general, competition authorities have regarded TV, radio and Internet content as distinct markets from printed press mostly because there is a different range and depth of information (e.g. European Commission in Recoletos / Unedisa or UK Competition Commission, in the Newsquest Ltd Independent News and Media plc). In particular, for the OFT (2009) it is often possible for newspapers to cover more of the background to a news story than can be covered in TV or radio news. The U.S. Department of Justice (2011) has a similar view. It states that it had concluded in past investigations that non-newspaper media do not sufficiently constrain the pricing of single newspapers, advertisements, the pricing of newspaper subscriptions or newspapers' investments in news and editorial content and thus are not in the same market. It does, however, not exclude future changes in

this definition[5]. In Switzerland, the Competition Appeal Authority broadly shares these views and sees radio, TV and the Internet as complements to the newspaper readers markets rather than as substitutes (Berner Zeitung AG/Tamedia AG/Wettbewerbskommission[6] and Tamedia AG/Espace Media). In addition, it does not consider mobile online news as a substitute to commuters dailies (accessed and read while commuting to work, e.g. in the train), among other things because of the small size of mobile phone displays.

In an early study, Ahlers (2006) shows that, in practice, there was a certain migration of traditional reading to online reading, but that the magnitude was limited. The study shows that at that time only 12% of U.S. adults were Internet news only users. This confronts with 22% of multichannel (on- and offline news readers) and 43% of offline only news readers. However, this is confirmed by a MIS study for Switzerland (M.I.S. Trend, 2009), which states that only 22% of users often use their Internet connection to read the press news (26% from time to time). This is again confirmed by a recent study by Latzer et al. (2012) which states that only 6% of Internet users do not read print newspapers at all and that 83% of them regularly read print newspapers[7]. More than by the content or the niches chosen by online or printed news the choice may be largely motivated also by habit and accessibility (Van der Wurff (2011)). The available information today therefore seems to indicate that, overall, it is not unreasonable to consider the printed press in Switzerland as still a separate market from radio, TV and Internet today and when viewing historical data from the beginning of the 21th Century.

***Different types of press products and local potential coverage***

Newspaper publishers produce a wide range of press products. The Swiss Competition Commission defines a market for free commuters' dailies independent from the market for other daily newspapers. Such commuters' dailies are usually characterized by very short news without providing further analysis. Commuter's dailies are distributed for free at central nodes of the public transportation system (also using distribution boxes instead of newspaper selling points). A central feature of such press products is their free and timely accessibility in trains when people are commuting. Such accessibility, it concludes, is not given to a sufficient degree by other media such as radio, TV and the Internet (although this may change in the future for example with e-readers). Regarding other newspapers, the Commission thinks that commuters' dailies may not satisfy the needs of a typical reader of a traditional newspaper and that they are therefore to be largely considered as complements. It also states that very few readers seem to exclusively read commuters' dailies. The market entry of the largest commuters' daily "20 minutes", is stated to have had a significant negative impact on single copy sales (dropping around 25% in seven years)[8], but that in the more important subscriptions market (from a revenue point of view) such a significant reduction could not be verified[9]. For this reason their overall substitutability with traditional newspapers seems to be limited. While the Competition Commission did not make a binding decision in this respect, the appeal body has corrected this by subsequently deciding that there would be no sufficient substitutability with other newspapers and that the reduction of single copy sales may also have other reasons[10]. Regarding magazines, the OFT affirms that on the demand side, there is a wide range of magazine on different subjects and that it would seem unlikely that consumers would substitute, for any given title, another title that had very different content. That would suggest magazines are forming a number of product markets based on their content, target audience and frequency of publication (OFT, 2009). The Swiss

[5] The U.S. Department of Justice further states that "this conclusion is perfectly consistent with the observation that newspapers have been losing subscription and advertising revenues to other media, as some degree of competition across market boundaries is the norm. Whether changes in technology and consumer preferences may lead to the conclusion that a relevant market should include sales of advertisements (or content) by both newspapers and other media remains something that should be analyzed on a case-by-case basis."
[6] RPW 2006/2, p.375
[7] Note that 7% of total users indicate that they have cancelled a newspaper subscription because the information was also available on the Internet.
[8] Berner Zeitung AG/20 Minuten
[9] Berner Zeitung AG/20 Minuten, RPW 2004/2, p. 540
[10] Berner Zeitung AG, Tamedia AG/Wettbewerbskommission in RPW 2006/2, p.347

Competition Commission has taken a similar position in its proceedings when affirming that there is a separate readers market for different types of magazines[11]. More importantly, it also defines a series of related markets in this context: 1) daily newspapers, which include local, regional, national and international news, 2) a market for newspaper advertising at national level 3) a market for newspaper advertising at regional and local level and finally 4) analogous separate advertising markets on local/regional as well as national level for radio and for TV advertising[12]. The Commission then even proceeds to define the specific geographic boundaries of each local/regional newspaper and advertisement market based mainly on their local reach. Some markets were even defined to be smaller than cantons. Nevertheless, it is found that there are even in urban regions high concentrations in daily (local) newspapers markets[13].

There are various studies analysing competition between local newspapers (Dewenter, 2003). In general the conclusion is that as a consequence of economies of scale in advertising and news production, in many cases, rural areas simply cannot support more than one newspaper publisher with regional coverage implying high market power. Empirical estimations of competition between newspapers are rare, given the complex nature of newspapers as a platform for readers and advertisers. There is literature that is arguing that in some cases, regions may overlap, leading to higher competition in overlap areas (Dertouzos & Trautman, 1990). This seems, however, as shown by the Swiss Competition Commission, to be rarely the case in Switzerland. Even on a national level competitive problems seem to arise (Argentesi & Filistrucchi, 2007; Argentesi & Ivaldi, 2005). The problem of market power of local newspapers is – at least in rural areas – in Switzerland also widely recognized.

From an institutional point of view, this paper focuses on the market for daily newspapers including local and regional content (as well as national and international news). This is the only market allowing for in depth local news coverage in many rural areas, as often no (sufficiently) local radio or TV station is present.

***Single copy sales channel (retail level)***

In general, two channels for the distribution of newspapers are distinguished: subscriptions and single copy sales at newspaper selling points. In the distribution and retail business operators offer "distribution channels" to distribute their content directly or via intermediaries to final customers at a given price.

An early proceeding by the Swiss Competition Commission has analysed the market for newspaper selling points in Swiss train stations[14]. It states that in theory single copy sale of newspaper may be possible in the form of a small additional business for a large part of businesses such as Convenience stores (selling food and near-food items[15]), tobacconists, etc. This possibility would, however, be restricted by the fact that wholesalers might ask for minimum revenues. Moreover in other markets restricted search costs a customer is willing to face are defined. For example the Commission had concluded that the market radius for small supermarkets to cover "basic shopping needs" is 10 minutes of travel time[16]. It seems clear that the radius for buying a newspaper would be lower. Similarly, the Office of Fair Trading states that the geographic market is likely to be highly localized, in particular for newspapers, given the need for convenient local purchases (OFT (2009)). There is therefore a very local market for individual newspaper selling points. However, in the model proposed

[11] Tamedia AG/Espace Media, RPW 2007/4 P. 605-629
[12] The differentiation of advertising markets between newspaper and other media seems common as target groups and marketing strategies are different. It can be noted here that the U.S. Federal Communications Commission had shown that cross-price elasticity between retail ads in local newspapers and radio is very small, between local newspapers and TV they even seem to be complementary (Bush, 2002).
[13] RPW 2007/4 P. 605-629
[14] RPW 1999/3, p.403-422
[15] Any other goods of daily use
[16] Valora/Cevanova, RPW 2009/1, p.77-80

in the next chapters, it is assumed that the geographic markets extend over the area of a commune, when considering only small communes. Finally, while from a supply perspective the subscriptions channel may be a valid substitute for sales to the single copy sales channel, from the demand side there are significant differences. Single copy sales target spontaneous buyers while subscriptions target habitual readers. For this reason the, Competition Commission does not see the two channels as belonging to the same market. In the model proposed, the newspaper sellers' market will therefore be considered in isolation.

Moreover, it should be noted here that single copy sales are particularly important for newly entering local newspaper seeking new customers. Shapiro and Varian (1999) show that newspapers (and information services in general) are *experience goods*, i.e. a consumer must experience them to value them (see also Nelson (1970))[17]. Experience goods have usually lower price elasticity as consumers fear that lower prices may be due to quality issues or unobservable problems. To be able to efficiently compete, firms must therefore offer consumers a way to easily experience the good. The marketing response to this phenomenon has often been to offer consumers free samples of such goods so that they can be aware of their value and (potentially) buy. The easiest way to experience a newspaper is usually to buy a single copy at a selling point. Often, publishers also offer trial subscriptions. In this case, however, this usually involves signing a cancellable contract for a period of one month or more as well as the exchange of address and billing details. If all selling point sales channels in an area were to (locally) disappear, this would clearly increase experience costs and entry barriers and therefore correspond to less upstream competition between publishers. Concretely, for instance it might be very difficult for a new small local newspaper to gain a customer base in rural areas when nearly no selling points were available. Paradoxically, therefore, in this market high (overall) retail profitability of newspaper selling points can increase total coverage (accessibility) and thereby competition between editors upstream (reducing informational bias).

The market regime in practice is described by the Competitions Commission as foreseeing that distributors both at wholesale and at retail level would only be intermediaries (between the publishers and the consumers) receiving each commissions for selling newspapers. Unsold copies are returned to the publisher at no cost[18]. In the Swiss market the direct largest customer of exclusive wholesaler Valora (see also next section) except Valora itself with 20% was Volg, a mainly small rural retailer, with about 11% of selling points supplied. Analysing in detail the data at disposal[19] (Figure 2), newspaper sellers seem to nearly always contemporarily sell other goods, most prominently a more or less broad range of food and near-food items (kiosks, groceries and petrol station make up for about 85% of newspaper selling points).

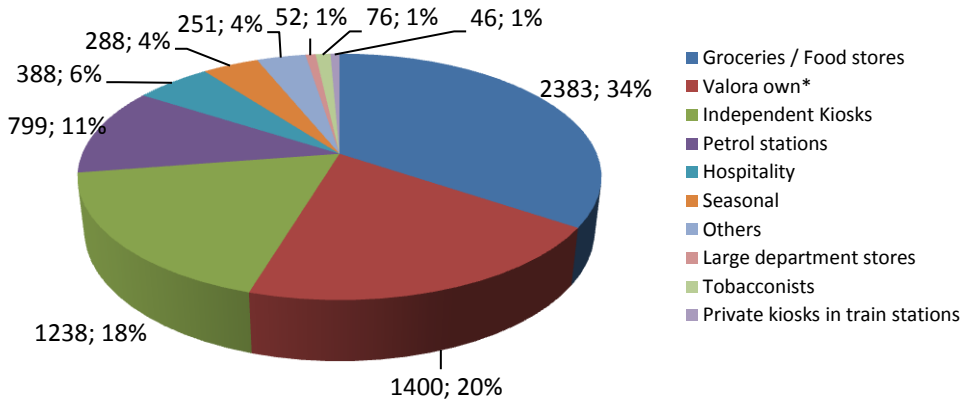



**Figure 2 – Number and type of newspaper selling points supplied by Valora, 2008**

[17] While in practice the informational content of every edition of a newspaper is different, it is assumed that once tried consumers can nevertheless value the quality of a particular brand of newspaper.
[18] RPW 1999/3
[19] Source: Presstalis 2008

Next to Valora and Volg, Coop stores with about 10% (retailer) and the Swiss Post (government control) with about 7% of selling points held considerable buyer shares in 2008. Post offices have for a long time distributed newspapers. This aspect will be mentioned in later chapters.

***Single copy sales channel (wholesale)***

A wholesaler of press products is an intermediary between the publisher producing newspapers and the retailers selling these products to the customers. A retailer is able to substitute a wholesaler only if the alternative wholesaler is able to supply all titles requested. Valora is acting as single exclusive wholesaler of (a large range of) press products of German langue titles[20] in Switzerland. In addition to its wholesale business, Valora is, as shown before, controlling also a number of retail newspaper selling points (mostly kiosks).

An important feature of the demand of newspapers of retailers is that they have to arrive soon in the morning as after 9 a.m. the units sold strongly decline. The Competition Commission has in the indicated merger proceeding defined consequently a wholesale market for the timely (early morning) supply of press products to retail newspaper selling points. It assumes that there are substantive economies of scale and scope in the logistic process constituting properties of a natural monopoly. It states that there would be a potential risk of discrimination in favor of Valora's own selling points or even of foreclosure and that it would intervene under in case such practices would take place. This means that in Switzerland, newspaper selling points should face homogeneous input products when compared to Valora (which does not exclude for example volume discounts a priori). It is also stated that such wholesalers may not have a similar dominant position when facing the publishers. These may have considerable buying power as they might potentially sign a contract with a new outside firm for wholesale distribution (e.g. Post).

***Subscription channel***

For newspaper subscriptions, publishers seem to need to ensure delivery at home before 6.30 a.m. as this seems to be, according to the Competition Commission, a requirement of the consumers[21]. Normal post delivery is usually completed before 12 a.m. in Switzerland. Nevertheless, the Swiss Post is able to ensure early delivery in most of Switzerland, but it has entered this business only very late (2007). According to the Commission the market shows properties of a natural (regional) monopoly, as the lowest costs are generated when early delivery is ensured by one single firm – similarly to the rest of postal services. In some (few) regions there are, however, still parallel early delivery operators present today, controlled mainly by local newspapers (sometimes in joint-venture) or the Swiss Post[22]. The Commission was critical towards the operators controlled by local newspapers as they could exclude new local newspapers. This conclusion has led to the blocking of a local joint-venture between the Swiss Post and local newspapers.

# 3. Public policy

The distribution markets under observation described earlier are the single copy as well as the subscription channel distribution of daily newspapers, which include local and regional content as well as national and international news

***Single copy sales channel (retail level)***

[20] Exclusivity contracts are signed, RPW 1999/3, p.403-422
[21] Post/Tamedia/NZZ
[22] This does not necessarily mean that similar competitive conditions are given for all competitors as the Post for example does not need to respect the ban of heavy road transport (over 3,5 tons) on Sundays and during the night - the time early delivery has to be organized.

The Post, which is still under full government control in Switzerland, has directly entered the newspaper retail market at different times. It has sold newspapers to final customers in 1'200 post offices from 1993 to 1998. Then, after a period of seven years, it had again entered this market in 2005 with 33 newspaper selling points in its post offices (urban and rural areas)[23] offering a small range of press products, including the most important regional and national daily newspapers and popular magazines (less than 25 titles in total). During a pilot phase, the Post did not work with Valora. Instead, it was directly supplied by the publishers. As the Post ensures early delivery of subscriptions for many local newspapers, such an agreement with publishers seemed possible (at least for a certain amount of time). Valora[24] later declared, however, that this agreement would not respect the long (exclusive) collaboration with the publishers and that it would engage in discussions with them. Subsequently direct negotiations between the publishers and the Swiss Post seemed to break down and the Post communicated after the trial in 2007 that it would "from now on" work with Valora. In 2008, the Post was operating 464 selling points (about 20% of post offices) supplied by Valora. Soon, however, Post seems to have entirely abandoned this business. In 2012 the post offices concerned seem to sell mainly other products such as stationery items, mobile phones and traveler items.

***Subscription channel***

The new postal law (Postgesetz, art.16)[25] foresees that newspapers which include local and regional content are awarded a reduction in delivery costs of 30 million CHF. Furthermore, 20 million CHF are foreseen for magazines of associations and foundations[26]. The delivery price reduction is valid, however, only for services under universal service (i.e. services from the Swiss Post). This applies therefore not to early delivery (before 12 a.m.), which is a liberalized market (BAKOM, 2012a). A large part of subscriptions are therefore not incentivized. To date the price reduction has therefore been mainly used by weeklies and a few local newspapers (BAKOM, 2012b). Also, wholesale distributors of newspapers to selling points could not profit from these reductions. The main motivation for the above provisions is the strong process of concentration of independent local newspapers in Switzerland (from 45 in the year 2000 to 32 in 2012). The Competition Commission has shown that in many areas there are strong concentrations with local newspaper accounting for often more than 60% of the local market share even when taking into account national titles[27].

To conclude, the newspaper distribution markets under consideration were affected in the past by the entry of public entities in the retail distribution market as well as in the wholesale distribution market for subscriptions. In addition there are subsidies for late delivery, which are used, however, only by a small fraction of newspapers. The following chapter will analyse the level of competition in the newspaper sellers' market and the appropriateness of entry of a public entity in this market.

# 4. Analytical Framework

Newspapers are generally sold to generate customer frequency ("foot traffic") at selling points, meaning that people may want to look for a place where to buy a newspaper and once there, they would also acquire other products (e.g. food and near-food items, tobacco etc.) (NAA (2012)). In other terms, it is held that selling newspapers is having a positive externality, which a newspaper seller would typically take into account. Cases would therefore even be possible where the seller has an unprofitable standalone business for selling newspapers, but it is reasonable to continue to sell when considering the positive externality on other products and services sold. From this point of view a

[23] http://www.post.ch/post-startseite/post-konzern/post-medien/post-archive/2005/post-mm05-pilotversuch-zeitungsverkauf/post-medienmitteilungen.htm
[24] In an interview still in Valora CEO Wüst in 2005
[25] The development of this law over the years is well explained in Ecoplan (2010)
[26] No such reduction is awarded to newspapers with a circulation of more than 100'000 copies. The government can add further criteria to award the reductions such as coverage, periodicity, extent of informational part or extent of advertising part.
[27] Tamedia/Espace Media, RPW 2007/4, p.621

newspaper selling point satisfies some of the criteria laid down by the Swiss Competition Commission to qualify for a two-sided market (namely positive externality), but as there are not two different customer groups involved, the property cited can be considered as a simple case of complement[28]. In addition, as described earlier, products which are typically sold together with newspapers may be many and different in their nature. Analysing entry and competition based on a structural model estimating demand and supply using prices and quantities of such products would therefore prove impossible. Recent estimation techniques exist, however, which allow empirical measures of competition through the observation of sellers' entry decisions and general demand and supply shifters. This means that it is possible to make inferences on the competitive interactions in a market of newspaper sellers considering a composite good sold without the need to collect data on individual products supposed to be in the affected market. In such case any complementary or substitutive effects between goods sold are internalised.

Based on Chamberlin (1933) and Panzar and Rosse's (1987) theoretical description of free-entry competition, Bresnahan and Reiss (1991) propose an "entry threshold" model which allows estimates of the minimum demand necessary for a specific number of firms to enter the market. Entrants may in this model face entry barriers. What is observed from the data is only whether entry occurs or not. The entry threshold is then defined as the market size required to sustain the entry of a particular number of firms. Following Bresnahan and Reiss (1991) it will be shown how entry thresholds ratios provide a scale free measure of the effect of entry on market power. The objective is to relate shifts in market demand to changes in the equilibrium number of firms. The degree of competitiveness in this market under progressive entry will then be used to evaluate public policy relating to newspaper distribution in Switzerland.

Suppose that *d(Z,P)* is the demand function of a representative customer, depending on the price of the good *(P)* and some other demand shifting variables *Z* (e.g. income). Suppose further that *S(Y)* is the number of customers, determined by some variables *Y* (e.g. population). Then total market demand can be expressed by:

$$Q^d = d(Z,P)S(Y) \quad (1)$$

Further fixed costs depending on some exogenous variables *W* (e.g. real estate availability in the commune) may be defined:

$$F(W) \quad (2)$$

For newspapers sellers, typical cost functions of local retailers may apply (as for instance for tire dealers in Bresnahan and Reiss (1991)). The standard model assumes that a firm's average and marginal costs are U-shaped. Hence, there are economies of scale at first, and after a certain quantity of composite goods sold, diseconomies of scale. Thus, there is a minimum efficient scale (MES) of output. It should be noted, that the marginal cost functions related to newspapers alone may (slightly) differ. This is assumed, however, to not have a substantial effect on the model, as it can be assumed that newspapers only account for a small part of total sales and margins of a typical newspaper seller. Still, it should be noted that for the sale of newspapers alone, marginal costs are decreasing or possibly constant as wholesale monopolist Valora seems to award quantity discounts[29] – a form of second degree price discrimination - after some levels of output per distribution point are reached (identical for all sellers)[30].

Consequently, with q being firm output, define

[28] Again, as explained by Ordover (2007) this is very similar to analyzing a "two-sided market".
[29] Concretely, Valora pays commissions per copy sold increasing with quantity. The fact that retailers do not pay for inputs, but are paid by wholesalers for their distribution services, is purely financial and does not change the analysis.
[30] Given the earlier cited decision of the Competition Commission it is likely that the Commission would intervene in case of discriminatory prices.

$$MC(q,W) \quad (3)$$

$$AVC(q,W) \quad (4)$$

It is assumed for simplification that the goods produced are homogeneous products[31]. It is therefore assumed that a typical newspaper seller would sell units of a virtual, composite good composed of newspapers and other products which are sold together with newspapers (typically some range of food and near-food products[32]). *P* is the corresponding price of such a composite good. There is assumed to be price flexibility over the whole range of goods sold. It should be noted, however, that such flexibility may not exist for the sale of newspapers alone as newspaper prices are printed on the front-page in Switzerland and are also usually charged. Given that newspapers only represent a small part of overall sales of newspaper sellers this aspect can again be neglected. As this papers' objective is to consider all sellers of newspapers, independently of which other products they sell, the model proposed provides an ideal (and probably the only possible) framework for empirical analysis of market power.

For graphical analysis purposes it can be supposed that each seller has in the long run the same cost functions. Figure 3 illustrates the entry threshold model[33].

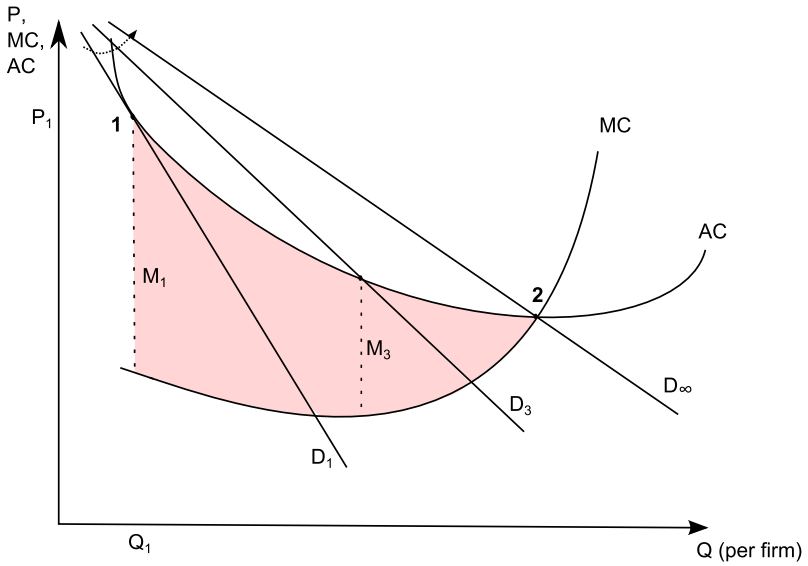



**Figure 3 – Entry threshold model (Bresnahan and Reiss (1991))**

It will now be analysed what happens if market demand rotates, i.e. if market size *S(Y)* increases. In the figure per firm demand level $D_1$ represents the minimal level of per firm demand a single newspaper seller would need to break even and to enter the market (*P=AC*, at point 1). From the level of demand $D_1$ onwards, a first firm could therefore cover its fixed costs and - potentially - enter the market. Although a newly entered monopolist just breaks even at price $P_1$, it earns the substantial price-cost margin $M_1$ for an additional unit (the differential between price and marginal cost). Suppose now that the market size *S(Y)* further increases. Given that *S(Y)* is multiplicative in the total demand function (where individual demand is supposed to be independent of the size of the market), total demand continues to rotate outwards. At a given price, the monopoly seller would therefore face more demand and become more and more profitable (total profit). However, the effect of rotating demand is twofold: It is not only increasing actual profits of the firm(s) in the market but it also increases the

[31] This is a simplifying assumption, as composite goods sold may have some level of differentiation between sellers.
[32] Both categories are fast moving consumer goods (FMCG)
[33] Note that this graph differs from traditional market demand analysis as the X axis is reporting the per firm quantities and not the market quantities.

profits of potential entrants (it is assumed that in case of entry the market is split and all operator obtain the same proportional share of total demand).

As market demand continues to rotate outwards – and so per firm demand (Figure 3) – it will eventually reach level $D_2$ (or more generally $D_N$): the minimum per firm demand a potential second (or more generally N-th) entrant would need to enter and break even. When an additional firm enters it would be expected that the new more competitive situation would lead to declining individual margins. Therefore, the more demand continues to rotate outwards, the more firms will enter and the more individual margins decline (at entry level).

When market demand rotates even further outwards, per firm demand grows ever larger in relation to minimum efficient scale (*MES*) and allows for more and more firms to enter. Eventually, per firm demand ($D_\infty$) will reach *MES*, where it will jointly with *MC* intersect *AC* and where margins, therefore, are competitive (zero). At this point, total demand may well continue to increase to infinity, but per firm demand would not be able to increase anymore, as a given firm which is already in the market would have zero profits and would make negative profits when increasing scale above *MES*. A new firm would therefore enter and produce, as all firms already in the market, at *MES*. $D_\infty$ therefore represents the maximum per firm demand.

Given that profitability is expected to decline with each additional selling point (at entry level) it must be expected that entrants will require more per firm demand to enter the later they enter. In particular a duopolist would need a higher number of customers to enter the market than a monopolist, which unlike the duopolist would profit from more favourable competitive circumstances (monopoly prices).

To conclude, in Figure 3 it can be observed that at the level of demand $D_1$, $S_1$ consumers pay price $P_1$ and the monopolist earns a price cost margin of $P_1$-$MC_1$. This is just enough to cover its fixed costs at this level of demand (minimal demand level of entry). When market demand grows further, and per firm demand rotates outwards, individual firms' margins decline at entry level as the number of firms in the market increases (from $M_1$ to $M_3$ to 0 at $D_\infty$). Eventually, a competitive outcome at *MES* is observed, where margins are zero, and, being at *MES*, total profits are also zero.

This analysis has considered the whole range of goods sold by newspaper sellers (composite good). When considering the sale of newspapers alone, the above assumptions may not be given. When moving, for instance, from a one to a two firm setting, at entry level the composite output per firm increases. Thereby, newspaper quantity discounts might also increase. At entry levels, there may therefore be a reduction in marginal costs related to newspapers alone with entry. At the same time, newspaper sellers do not have pricing flexibility and cannot adjust their prices in response to successive entry and competition. For the sale of newspapers alone margins at entry levels may therefore paradoxically increase (or remain constant) with entry (at entry level). This is, however, assumed not to have a substantial effect on the model, as newspapers only account for a small part of sales and margins of newspaper sellers.

***Formalisation***

The objective of the model is to relate the number of firms in the market *N* to the size of the market *S* at entry level. Therefore, as the size of the market increases (i.e. demand rotates outward), how does it affect entry? The consequences of entry by relating shifts (respectively rotations) in market demand to changes in the equilibrium number of firms can be examined. The basic concept which will be used to build the model is the one illustrated in Figure 3: the zero-profit conditions indicate the "entry level" of demand for a monopoly, a duopoly, or in general a n-oligopoly firm.

A monopolist's break-even-condition is that profits (for a given size of the market) are zero. The size of the market which satisfies this equation gives the trigger market size for a monopolist to (potentially) enter the market (*S1*). Formally,

$$\Pi_1(S_1) = \left[P_1 - AVC(q_1, W)\right] d(Z, P_1) \frac{S_1}{1} - F(W) = 0 \quad (5)$$

Where *AVC* is average variable cost. This expression is necessary as fixed costs need to be specified separately from variable costs in this model.

$$\left[P_1 - AVC(q_1, W)\right] d(Z, P_1)$$

is therefore the variable profit per customer (equal to the variable profit per unit times the number of units demanded per consumer). Now solve for the entry market size or "entry threshold" where a monopolist first breaks even:

$$S_1 = \frac{F(W)}{\left[P_1 - AVC(q_1, W)\right] d(Z, P_1) / 1} \quad (6)$$

This is the market size (number of customers) needed for one firm (the first) to enter the market. The higher the fixed costs or the lower the variable profits per customer, the higher the minimal market size required for one firm, the monopolist, to enter.

Now, assume the market size (and per firm demand) grows and firms enter as in the graphical illustration. Then, Fehler! Verweisquelle konnte nicht gefunden werden. can be generalized to describe the zero profit function of an *N*-th operator to enter the market, assuming that the market size is split equally among the *N* firms in the market:

$$\Pi_N(S_N) = \left[P_N - AVC(q_N, W)\right] \frac{d(Z, P_N) S_N}{N} - F(W) = 0 \quad (7)$$

This can be represented graphically by Figure 4.

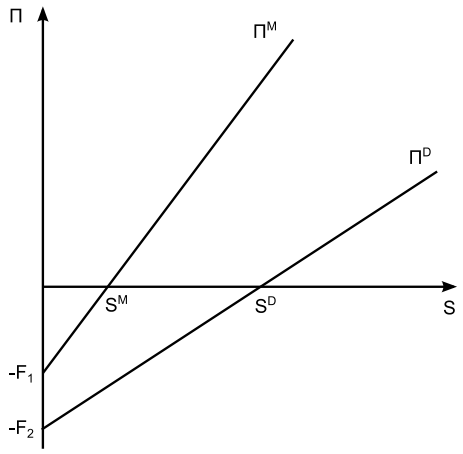



**Figure 4 – Entry thresholds for a monopoly and a duopoly**

The slopes of the profit functions are the variable profits per customer in the market in the cases of monopoly and duopoly. Naturally, a monopolist reaches the break-even-point earlier than a duopolist as demand increases. The market entry threshold for a second, duopoly firm, $S^D$ is always bigger than two times $S^M$ (firm entry threshold ratio of at least unity). The reason for this is that the average profitability of a firm in duopoly is lower due to competition or, also, because the fixed costs of the second firm are higher (opportunities for instance are rare, e.g. buying adequate real estate for selling space etc.) or most probably because of a combination of these two factors.

Now the *"entry threshold"*, i.e. the minimal total market size necessary for *N* identical firms to enter ($S_N$) is:

$$S_N = \frac{N\,F(W)}{\left[P_N - AVC(q_N, W)\right] d(Z, P_N)} \tag{8}$$

The "*per firm entry threshold" (or entry level of demand)* $s_N$ is the minimal market size that is needed for each single one of the *N* firms to enter, i.e.

$$s_N = \frac{S_N}{N} \tag{9}$$

$$s_N = \frac{F(W)}{\left[P_N - AVC(q_N, W)\right] d(Z, P_N)} \tag{10}$$

With increasing market demand this threshold converges to some value, i.e.

$$s_\infty = \lim_{N \longrightarrow \infty} \frac{S_N}{N}$$

where $s_\infty$ is the per firm demand able to sustain any number of firms (*MES*). Finally, the *"per firm entry threshold ratio"* may be defined as follows

$$s_{N+1} / s_N = \frac{F_{N+1}(W)}{F_N(W)} \frac{\left[P_N - AVC(q_N, W)\right] d(Z, P_N)}{\left[P_{N+1} - AVC(q_{N+1}, W)\right] d(Z, P_{N+1})} \tag{11}$$

The per firm entry threshold ratios, which are estimated in this paper, measure the fall in variable profits per unit by going from a market with *N* firms to a market with *N+1* firms when holding fixed costs and demand per consumer constant. Accordingly, this is a useful expression indicating how much variable profits decline as competition becomes more intense due to entry. It should be noted that this is no measure of the absolute level of profits or competition but on their development when moving from a market with *N* firms to a market with *N+1* firms.

If:

a) Firms have the same fixed costs and

b) Competitive conduct does not change (constant (total) variable profits) with entry

Then, the per firm entry threshold ratio from moving from an industry with *N* players to an industry with *N+1* players is

$$s_{N+1} / s_N = 1 \tag{12}$$

When, instead, ratios higher than one are measured, this must mean that average profitability drops with entry and that a new entrant would need more per firm demand than the preceding entrant to break even (still assuming constant fixed costs) to absorb the increase in competition. Departures of entry thresholds from one therefore measure how competitive conduct changes with successive entry.

Conversely, in an already competitive equilibrium, if firms have the same fixed costs and entry does not change competitive conduct (profitability) anymore it can be expected that the ratio remains one. In this case it would take the same additional market size for a firm to enter in the market with *N* firms as

in a market with *N+1* firms. As this measure cannot distinguish the levels of competition though, a per firm entry threshold ratio of one is compatible with both perfect competition as well as a perfect cartel. However, if due to entry a strong increase in competition is observed, it can only be concluded that in the situation preceding entry there was significant market power. The entry thresholds - for the mentioned reasons - are a useful scale free measure of competition.

# 5. Econometric model

The model can be transformed to allow econometric estimation of entry threshold ratios. Variable profits per customer in a market with *N* firms *($V_N$)* can be defined as:

$$V_N = \left[P_N - AVC(q_N, W)\right] d(Z, P_N)$$

Therefore,

$$s_{N+1} / s_N = \frac{V_N}{V_{N+1}} \frac{F_{N+1}(W)}{F_N(W)}$$

Market size *S* is supposed to be determined by a series of demand rotating variables *Y*

$$S(Y;\lambda) \tag{13}$$

Where $\lambda$ is a parameter vector. Suppose now that average variable profitability $V_N$ in a market with *N* firms decreases with the number of firms in the market and increases with demand shifting variables (e.g. income per capita). The following additive setting will be used, where $\alpha$ parameters are expected to be positive and decreasing with the number of firms, i.e. $\alpha_N$ should be smaller the bigger *N*.

$$V_N(Z,W,\alpha,\beta) = \alpha_1 + X\beta - \sum_{n=2}^{N} \alpha_n \tag{14}$$

*Z* represents demand shifters and *W* (average variable) costs shifters, which are both included in *X*. Suppose further that fixed costs *F* are allowed to be increasing with the number of firms (Equation 15).

$$F_N(W,\gamma) = \gamma_1 + \gamma_R W + \sum_{n=2}^{N} \gamma_n \tag{15}$$

This would account for the fact that later entrants may have higher fixed costs, for example because opportunities are rare. Therefore, it can be expected that *γ's* are positive, but decrease with *N*. Finally, fixed cost shifters *W* are included (e.g. real estate prices or availability). For estimation purposes, total profits in a market with *N* firms can be expressed as

$$\Pi_N = \overline{\Pi}_N + \varepsilon = S(Y,\lambda) V_N(Z,W,\alpha,\beta) - F_N(W,\gamma) + \varepsilon \tag{16}$$

where $\overline{\Pi}_N$ is the latent variable and ε, the error term, is assumed to be the profit which cannot be observed. This setting allows for a probit estimation in the next section. The error term is assumed to follow a normal distribution, to be independent and to be identically distributed across the markets. Moreover, the term is assumed to have mean zero and variance one throughout. The estimation framework described in the next chapter will allow for prediction of the number of firms in the market.

***Estimation procedure***

The entry decision of a firm depends on whether an additional firm can earn positive profits. But also the entry decision of the firm that had entered previously to the new entrant will need to be taken into

account. If this firm is in the market, it must mean that it earns positive profits. Formally, if profits of the first firm are negative, no entry is possible. If such profits are positive, a firm can enter. Profits in monopoly, however, have to be lower than those necessary to sustain two firms, as otherwise two firms would enter. Therefore, when considering only three states (zero, one or two firms):

$$\begin{aligned}
&\Pr(N=0) = \Pr(\Pi_1 < 0) = \Pr(\overline{\Pi}_1 + \varepsilon < 0) = \Pr(\varepsilon < -\overline{\Pi}_1) = \Pr(\varepsilon > \overline{\Pi}_1) = 1 - \Pr(\varepsilon \le \overline{\Pi}_1) = 1 - \Phi(\overline{\Pi}_1) \\
&\Pr(N=1) = \Pr(\overline{\Pi}_1 + \varepsilon \ge 0 \, and \, \overline{\Pi}_2 + \varepsilon < 0) = \Pr(\varepsilon \ge -\overline{\Pi}_1 \, and \, \varepsilon < -\overline{\Pi}_2) = \Pr(\varepsilon < \overline{\Pi}_1 \, and \, \varepsilon \ge \overline{\Pi}_2) \\
&\qquad = \Phi(\overline{\Pi}_1) - \Phi(\overline{\Pi}_2) \\
&\Pr(N=2) = \Pr(\overline{\Pi}_2 + \varepsilon \ge 0) = \Pr(\varepsilon \ge -\overline{\Pi}_2) = \Pr(\varepsilon < \overline{\Pi}_2) = \Phi(\overline{\Pi}_2)
\end{aligned} \tag{17}$$

The above formalised model explains entry by the level of profit in the market. It can, however, not be estimated by a standard regression which would treat the difference between category 0 and 1 in the same way as the difference between category 1 and 2, whereas in fact these differences correspond only to a ranking. The model must therefore be estimated by a model capable to handle discrete ordered choice dependent variables (Maddala, 1983). The model refers to the cumulative normal distribution function (associated to the probit regression). Ordered probit is a common specification for ordinal response models. The model is estimated using standard maximum likelihood procedure. The maximum likelihood can be written as follows

$$L = \prod_{m=1}^{1042} 1(n_m = 0)\left[\Phi(\overline{\Pi}_1))\right] \prod_{m=1}^{1042} 1(n_m = 1)\left[\Phi(\overline{\Pi}_2) - \Phi(\overline{\Pi}_1)\right] \prod_{m=1}^{1042} 1(n_m = 2)\left[1 - \Phi(\overline{\Pi}_2)\right] \tag{18}$$

where $\Phi()$ is the inverse normal cumulative function, when, as assumed, the single probabilities are independent. The likelihood of the observed outcome is therefore maximised by maximising the product of probabilities for each state. $1(n_m = j)$ is equal to 1 if in market *m* a number of *j* firms is found and zero otherwise. Maximising a product is equivalent to maximising the logs of it, i.e.

$$\begin{aligned}
\ln L = &\sum_{i=1}^{1042} 1(n_m = 0) \ln\left(\Phi(S(Y,\lambda)V_1(Z,W,\alpha,\beta) - F_1(W,\gamma))\right) \\
&+ \sum_{i=1}^{1042} 1(n_m = 1) \ln\left[\Phi(S(Y,\lambda)V_2(Z,W,\alpha,\beta) - F_2(W,\gamma)) - \Phi(S(Y,\lambda)V_1(Z,W,\alpha,\beta) - F_1(W,\gamma))\right] \\
&+ \sum_{i=1}^{1042} 1(n_m = 2) \ln\left[1 - \Phi(S(Y,\lambda)V_2(Z,W,\alpha,\beta) - F_2(W,\gamma))\right]
\end{aligned} \tag{19}$$

This function can now be maximised with respect to the parameters. The particular challenge of the econometric model with respect to usual ordinal response models is that it is nonlinear.

# 6. Data on Swiss communes

When defining from a geographical point of view local newspaper selling markets in Switzerland, it may be reasonable to define it to extend to the communal territory (as in Bresnahan and Reiss (1991)). In many cases, in rural areas, a large part of the commune can be reached within a reasonable walking distance. Between two neighbouring rural communes, there is typically a more or less extended area of relatively low population density, which may constitute an obstacle to cross-commune demand. Observations can therefore be considered sufficiently independent, especially in rural areas which constitute the areas of greatest interest. The data summarized in Table 1 is used for estimation.

| Variable | Name in dataset | Unit | Definition | Source | N | Mean (abs) | Std. dev. (abs) |
|---|---|---|---|---|---|---|---|
| $N$ | *blick* | | Number of newspaper selling points (Blick) in each commune, 2004 | Ringer/ Blick | 1667 | 3.83 | 15.7641 |
| ***Market size*** | | | | | | | |
| $y_1$ | *pop* | 000s | Permanent residential population, 2002 | BFS | 1667 | 3.11 | 10.89 |
| $y_2$ | *CommutersIN* | 000s | Number of commuters into the commune, 2004 | BFS | 1623 | 1.13 | 6.82 |
| ***Representative customer demand shifters*** | | | | | | | |
| $z_1$ | *inc* | kCHF | Average taxable income per commune, 1998 | ESTV | 1646 | 60.78 | 10.9 |
| $z_2$ | *old* | 000s | Residential population having over 65 years per commune, 2004 | BFS | 1666 | 0.15 | 0.04 |
| $z_3$ | *foreigners* | 000s | Foreign residential population, 2002 | BFS | 1652 | 0.10 | 0.08 |
| $z_4$ | *edu* | 000s | Average number of schooling years per commune, 2004 | BFS | 1658 | 11.53 | 0.60 |
| ***Fixed cost shifters*** | | | | | | | |
| $W$ | *farmlpc* | CHF (100= 1/2000) | Area used for agriculture per capita for each commune, 1997 | BFS | 1667 | 0.86 | 2.19 |

**Table 1 – Dataset used to estimate entry threshold ratios for Swiss newspaper sellers**

The number of newspaper selling points in Swiss communes in the German-speaking part of Switzerland is analysed in this paper. This number is measured by the number of sellers which sell the national daily "Blick", which is one of the papers sold virtually in all distribution points in the German-speaking part of the country. It can be supposed that selling points which are selling this newspaper would also sell the relevant local newspapers of the regions in which they are active. It is therefore assumed to be a good approximation of the total number of newspaper sellers.

Figure 5 shows the frequency distribution for communes, by the number of sellers.

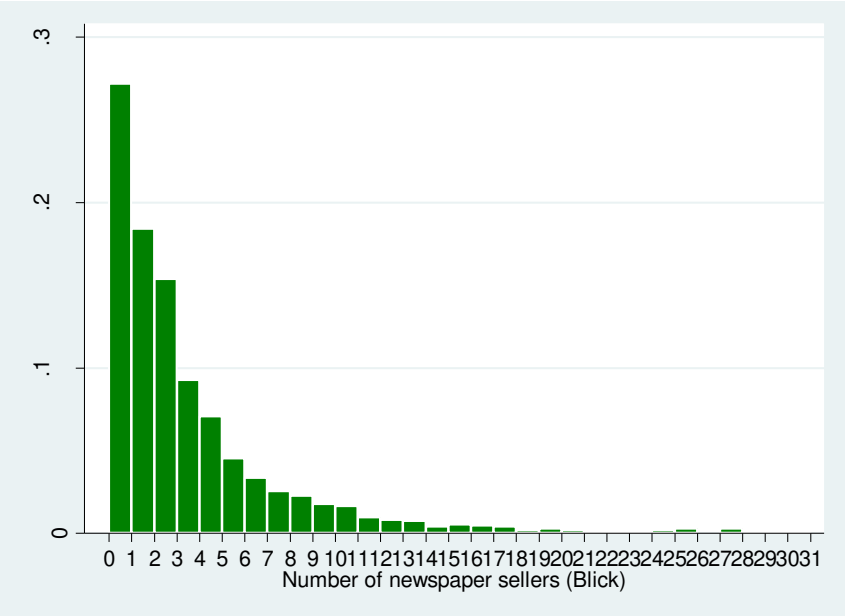



**Figure 5 – Number of newspaper sellers in Swiss communes (frequency distribution)**[34]

The number of observations corresponds to the total number of communes in the German-speaking part of Switzerland[35]. Many communes do not seem have a newspaper selling point (27%). All other communes have one or more selling points. Moreover, the case of more than four sellers in a commune is relatively rare. There are, however, eleven outlier observations (Zurich for example is having 515 selling points). Also, as can be seen from Figure 6 the large majority of communities have a population below 1'000.

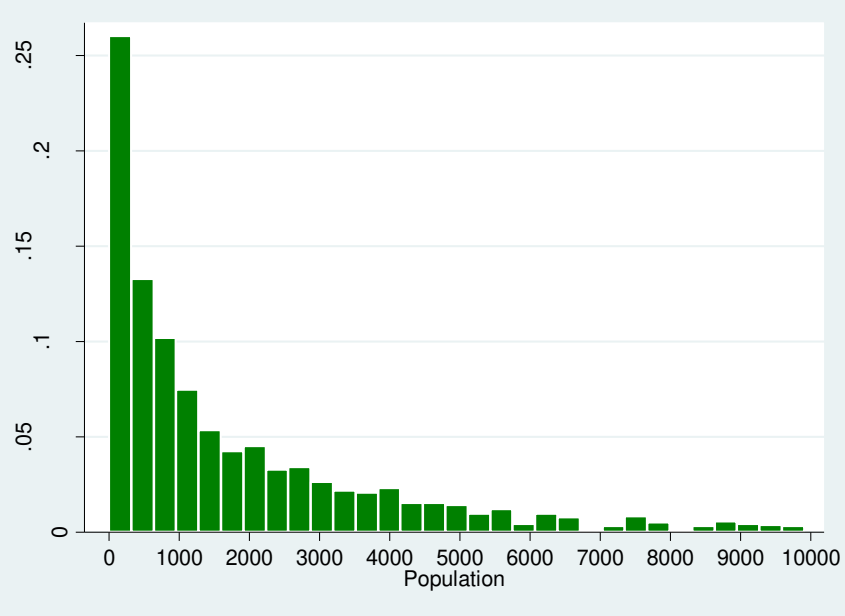



**Figure 6 – Population in Swiss communes, frequency distribution**[36]

[34] STATA input: "hist blick if pop<40000 & pop!=0"
[35] Except for the communes in the Canton of Thurgau, which were omitted, because there were changes in the geographic definition of communes over the years under consideration.
[36] STATA command: dotplot pop if pop<40000 & pop!=0

The model builds on the idea that population is one determinant of the relevant market size for newspaper sellers and that market size, in turn, influences the number of entrants. Residential population and inbound commuters to the commune are used as indicators for the size of the market a seller can potentially address in the commune[37]. Moreover, income is used as a demand shifting variable in the model. In addition, as in Bresnahan and Reiss (1991) demographic variables are used to control for possible differences between communes (population over 65 years, foreigners). Finally, the average schooling years are introduced as a control, as education levels may have an effect on demand for newspapers. Finally, it is proposed to include the farmland area per capita in the commune as an indicator for low real estate prices and, therefore as an adequate fixed cost shifter in a commune.

# 7. Estimation and interpretation of results

In this chapter , a model is fitted to calculate entry thresholds, per firm entry thresholds and per firm entry threshold ratios. Then, tests to verify the validity of results are performed and results are interpreted. Practically speaking, estimating Equation 19 is a complex task, which needs to be performed by designing a dedicated nonlinear ordered probit optimization algorithm (see annex) as well as test algorithms. Different similar algorithms have inspired this design, in particular Youle (2012) and Evdokimov (2013).

The regression results are reported in Table 2.

| | Coefficient estimate | Std. err. | P>\|z\| |
|---|---|---|---|
| $\lambda_0$ *(pop)* | 1 (set) | - | - |
| $\lambda_1$ *(commuterIN)* | .7810 | .2173 | 0.000 |
| $\beta_1$ *(inc)* | -.0028 | .0014 | 0.050 |
| $\beta_2$ *(old)* | 1.494 | .3138 | 0.000 |
| $\beta_3$ *(foreigners)* | .5744 | .1913 | 0.003 |
| $\beta_4$ *(edu)* | -.0353 | .0318 | 0.266 |
| $V_1(\alpha_1)$ | 1.249 | .3200 | 0.014 |
| $V_1 - V_2(\alpha_2)$ | .1652 | .0673 | 0.020 |
| $V_2 - V_3(\alpha_3)$ | .1862 | .0375 | 0.000 |
| $V_3 - V_4(\alpha_4)$ | .1103 | .0245 | 0.000 |
| $V_4 - V_5(\alpha_5)$ | .1062 | .0187 | 0.000 |
| $F_1(\gamma_1)$ | .4920 | .0758 | 0.000 |
| $F_2 - F_1(\gamma_2)$ | .9882 | .0818 | 0.000 |
| $F_3 - F_2(\gamma_3)$ | .3590 | .0645 | 0.000 |
| $F_4 - F_3(\gamma_4)$ | .2120 | .0597 | 0.000 |
| $F_5 - F_4(\gamma_5)$ | .0946 | .0496 | 0.057 |
| $\gamma_R$ | -.0385 | .0178 | 0.031 |
| *Prob> $\chi^2$* | 0.000 | | |
| *N* | 1596 | | |

**Table 2 – Nonlinear ordered probit estimates**

As in Bresnahan and Reiss (1991), the coefficient on population was set equal to one (i.e. market size expressed in terms of residential population). Most coefficients are as expected and significant at 10%. Prob($\chi^2$) = 0.000 indicates that the null hypothesis that all coefficients are jointly equal to zero can be

[37] It is abstracted here from outward commuters.

rejected and therefore the model as a whole is significant as well. The following basic equations were implicitly estimated with the ordered probit model.

$$\hat{S}(Y,\lambda) = \widehat{\lambda_0} Y_0 + \widehat{\lambda_1} Y_1 \quad (20)$$

where $Y_0$ is population and $Y_1$ is inbound commuters.

$$\widehat{F_N} = \widehat{\gamma_1} + \widehat{\gamma_L} W + \sum_{n=2}^{N} \widehat{\gamma_n} \quad (21)$$

where the *W* variable is the available agricultural land per capita in the commune, and

$$\widehat{V_N} = \widehat{\alpha_1} + X\hat{\beta} - \sum_{n=2}^{N} \widehat{\alpha_n} \quad (22)$$

where the *X* variables include income in the commune and socio-demographic variables such as the number of aged people in the commune, the average number of schooling years and foreign resident population. As described before, it is expected that all $\alpha$ and $\gamma$'s are positive in order to ensure decreasing average profits and increasing fixed cost with successive entry. This is the case for all 10 affected $\alpha$ and $\gamma$ coefficients and they are all significant at 10%[38].

As described before, ***CommutersIN*** is the number of people commuting to the commune under observation. Such commuters seem to have a significant and only slightly less strong importance in determining the relevant market size with respect to residential population (set to 1 for normalisation reasons). In this case, one resident of the commune counts as 1 in the market size considered by the newspaper seller. The commuters to the commune count as 0.78. Thus, the market size of a given commune can be calculated using the formula:

$$\hat{S}(Y,\lambda) = 1\ Pop + 0.78\ CommutersIN \quad (23)$$

This is important, as all subsequent analysis referring to the "market size" of a commune refer to this value for a given commune, not its population.

***Income*** in the commune does not seem to be, as could be expected at first, a positive but a negative demand driver. This seems, however, reasonable as many goods typically sold by newspaper sellers are inferior goods (e.g. cold packaged sandwiches, tobacco, lottery, etc.). It is therefore possible that, in richer communes, people are less likely to visit such sellers and may prefer more specialised suppliers. In addition, it can also be expected that in such communes subscribership for newspapers is higher and demand at selling points is consequently lower.

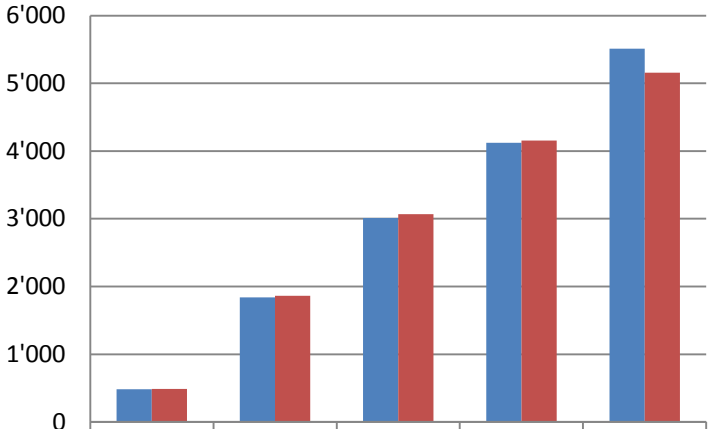
The amount of **elderly people** in a commune seems to have a strong and significantly positive effect on the variable profits of newspaper sellers in a commune. This might reflect the fact that retired people have more time to visit such retailers. Also, the size of the **foreign** residential population seems to have a significant positive effect on newspaper sellers' profitability and entry. It is possible that this population segment (contrary to rich people) has higher demand for goods sold at typical newspaper selling points. Moreover, the number of average **schooling** years in a commune has an insignificant effect on newspaper sellers' overall profitability. Finally, the **area** used for agriculture per capita is having the expected significant and opposite effect to land prices for which it is used as a proxy.

What is of particular interest in this article is, however, not the detailed demand or cost effects for products sold by firms selling newspapers, as these concern a largely undefined set. The focus of this article is on competitive effects of entry which are analysed in the next section.

[38] The circumstance that $\gamma_5$is not significant at 5% is unproblematic for the model. A late entrant might well once not have significantly higher fixed costs than the preceding entrant.

### *Entry threshold estimation*

The entry thresholds or minimum market sizes for an N-th firm to enter the Swiss newspaper sellers' market can be calculated using Equation 8, the ordered probit coefficient estimates and the mean values of the variables[39]. Results are reported in Table 3 and Figure 7. In theory, calculating the entry threshold might imply using state-dependent mean of the variables. It is, however, shown that in practice differences in results are negligible (these values are reported in the second rows of the table and are denoted by *S** (red in the figure) instead of *S* (blue in the figure)).




| | S1 | S2 | S3 | S4 | S5 |
|---|---|---|---|---|---|
| Newspaper retailers, S | 482 | 1'841 | 3'012 | 4'123 | 5'512 |
| Newspaper retailers (state dep. sample means), S* | 490 | 1'864 | 3'066 | 4'154 | 5'156 |

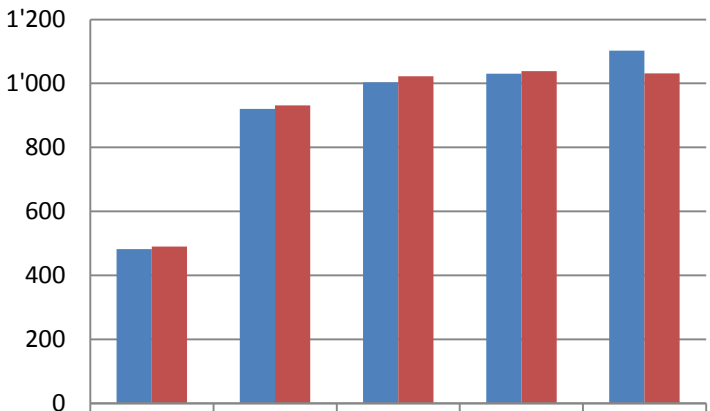
**Table 3, Figure 7 - Entry thresholds in terms of population[40], allowing an N-th firm to break even**

Market size values are expressed here in terms of population (potential customers), but are referring to commune market size and therefore not only residential population. For example Table 3 indicates that a newspaper selling monopolist may enter at a market size of 482 (in terms of population), the second firm at market size 1'841 etc. Whether a given commune is below or above this threshold is calculated using Equation 23. For instance, when verifying whether entry of a first newspaper seller is economically sustainable in the town of Luchsingen, one would have to consider its population (938) as well as its inbound commuters (127). In total, this town would represent a market size of 1'037 (938 + 0.78*127). As the first entry threshold is 482 and the second is 1'841, it would be concluded that entry of one seller in this commune is economically viable, but that competition, i.e. the entrance of a second seller, is not. This conclusion is independent of the real situation in the single commune (whether entry has actually taken place or not), which may also be different. It can be noted here that using state-dependent means[41] reduces the entry threshold for the 5$^{th}$ (or more) firm but does not otherwise lead to significantly different results.

### *Per firm entry thresholds*

The per firm entry thresholds can be calculated using Equation 9 on the basis of the entry thresholds reported in Table 4. Per firm entry thresholds are reported in Table 4 and Figure 8.

[39] The STATA algorithm is programmed to calculate entry thresholds directly.
[40] While everything is expressed in terms of population, when checking whether a commune is affected or not by these rules, commuters need to be added to population.
[41] This would imply, for example, that for the calculation of the estimates of variable profits (Equation 22) for each state (i.e. from zero to five entrants) the X values considered are not the overall sample means but the sample means applying to each state of the variable.



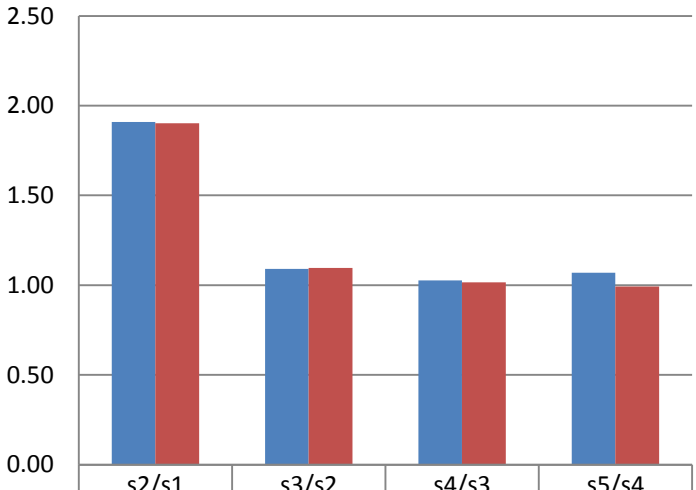

| | s1 | s2 | s3 | s4 | s5 |
|---|---|---|---|---|---|
| Newspaper retailers, s | 482 | 921 | 1'004 | 1'031 | 1'102 |
| Newspaper retailers (state dep. sample means), s* | 490 | 932 | 1'022 | 1'039 | 1'031 |

**Table 4, Figure 8 - Per firm entry thresholds in terms of population**

It can be seen that per firm entry thresholds increase with entry as expected and settle around a per firm market size of 1'000 (in terms of population). It can be seen that the per firm entry threshold for a second firm to enter is nearly double the entry threshold for a monopolist. Competition therefore seems to strongly increase with the entry of a second firm. This result can be stated more clearly in the analysis of per firm entry threshold ratios.

***Per firm entry threshold ratios***

The per firm entry threshold ratios can be calculated using Equation 11 on the basis of the per firm entry thresholds reported in Table 4. Per firm entry threshold ratios are reported in Table 5 and Figure 9.




| | s2/s1 | s3/s2 | s4/s3 | s5/s4 |
|---|---|---|---|---|
| Newspaper retailers, S | 1.91 | 1.09 | 1.03 | 1.07 |
| Newspaper retailers (state dep. sample means), S* | 1.90 | 1.10 | 1.02 | 0.99 |

**Table 5, Figure 9 - Per firm entry threshold ratios**

The per firm entry threshold ratios behave as expected and approach one the more firms enter (meaning competition is not affected anymore by further entry). What must be noted here is that the first per firm threshold ratio $s_2/s_1$ is significantly higher than subsequent ratios. This seems to indicate

that there is a strong increase in competition when the second seller enters. A slight increase in competition may be observed with the third seller, while entry of the fourth or further firms does not seem to further increase competition. It should be noted that when using full sample means $s_5/s_4$ is higher than the preceding threshold ratio. This should not be that case as this implies a slight reduction of competition with further entry. While this is theoretically possible it is unlikely in practice. The value of $s_5/s_4$ is, however, slightly different and in line with theory when using state-dependent means. It can therefore be expected that this effect is created by some outliers (larger cities) which are included in category 5. Using state-dependent means, such outliers may be addressed more appropriately.

***Equality tests for per firm entry thresholds***

In order to ensure that the conclusions on per firm entry threshold ratios and competition are correct a Wald test for threshold proportionality can be performed (The per firm entry threshold ratios can be calculated using Equation 11 on the basis of the per firm entry thresholds reported in Table 4. Per firm entry threshold ratios are reported in Table 5 and Figure 9.

). The algorithm is reported in the annex.

| $s_5 = s_4$ | $s_5 = s_4 = s_3$ | $s_5 = s_4 = s_3 = s_2$ | $s_5 = s_4 = s_3 = s_2 = s_1$ |
|---|---|---|---|
| $\chi^2$ (1) = 0.08<br>P > $\chi^2$ = 0.77 | $\chi^2$ (2)= 0.21<br>P > $\chi^2$ = 0.90 | $\chi^2$ (3)=1.42<br>P > $\chi^2$ = 0.70 | $\chi^2$ (4)=35.32**<br>P > $\chi^2$ =0.00 |

**Table 6 – Wald tests for equality of per firm entry thresholds**

Formally, the test results show that the hypothesis $s_5 = s_4 = s_3 = s_2$ cannot be rejected. Conversely, it can be concluded that $s_5 = s_4 = s_3 = s_2 = s_1$ can be rejected.

The test results show that there is no significant difference between the per firm entry thresholds when moving from a duopoly to a three, a four or a five firm market environment. In other words, firm do not require substantially more customers to enter than in an environment with fewer competitors. Unsurprisingly, the test confirms that the contrary is true when moving from a monopoly to a duopoly environment, where, as shown before, the market size necessary for entry of a duopolist to enter is much higher than the size necessary for the monopolist to enter.

The results imply equally that the hypothesis that each entry thresholds ratio pair is equal to 1 can be rejected except for the first pair. Again, this is not surprising as our graphical analysis shows that there is a strong decrease in per firm entry threshold ratios when the second firm enters $(s_2/s_1)$, but not afterwards. When interpreting the right hand side of Equation 11 it can be concluded that when holding fixed costs constant, variable profits remain the same when moving from a two to a three, four or five (or more) firm environment, but not when moving from a one to a two firm environment. The test therefore indicates that there is a significant increase in competition with entry of the second firm, but none for subsequent entry. In other words, it seems that in the newspaper sellers' market two firms in a commune are sufficient to ensure competition.

***Benchmarking results***

It can be useful to compare these results to values found by other authors. While no other study has tried to estimate entry threshold ratios in the market for newspaper sellers, these results may be compared to results in other markets. Most importantly, the above results[42] can be compared to the values found by Bresnahan and Reiss (1991) for tire dealers, dentists, druggists and plumbers and to Abraham, Gaynor and Vogt (2007) for hospitals (Figure 10).

[42] Using state-dependent means

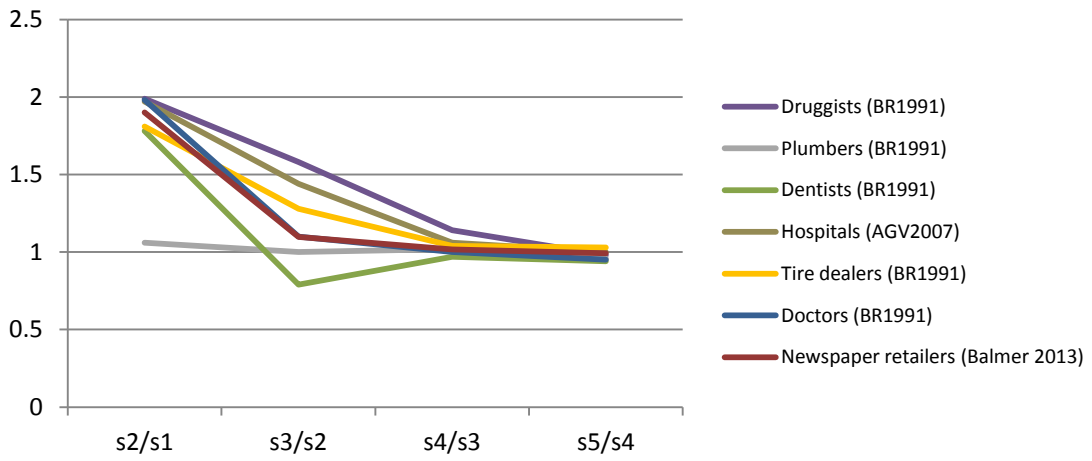



**Figure 10 - Per firm entry threshold ratios for Swiss newspaper sellers in comparison**

It can be seen that the estimates made in this article are well within the bounds of other estimates of per firm entry threshold ratios. Interestingly, Bresnahan and Reiss' (1991) estimates for U.S. doctors are virtually the same as those for Swiss newspapers. Entry effects on competition in these two markets can therefore be expected to be identical. Other results may also be stated here as the model has been applied by other authors in recent years. Most importantly, Abraham, Gaynor and Vogt (2007) study the entry of hospitals in U.S. cities. They find entry threshold ratios of 1.97, 1.44 and 1.06 meaning that competition is driven mostly by the entry of a second and third hospital (a development of competition with entry similar to druggists in Figure 10). Their results are used to conclude that blocking hospital mergers implying moving from three to two firms or from two to one in a local market (as contextually proposed by the U.S. antitrust authorities but rejected by the Court) may likely cause significant harm to competition and consumers.

The estimate for the first entry threshold ratio in the Swiss newspaper sellers' market is high at 1.9 (i.e. the second entrant needs 90% higher per firm demand to enter than the first entrant). However, Abraham, Gaynor and Vogt (2007) and Bresnahan and Reiss' (1991) estimates of other markets - with the exception of plumbers - seem to be similarly high. It seems therefore that it is common that the second entrant importantly increases competition in the market. For subsequent entry, the situation is less clear and depends on the market. From a qualitative point of view, newspaper sellers can likely be best compared to (other) retail markets. For instance, a comparison with plumbers which usually sell services and may be more location independent may be less adequate. Also, entrance in the doctor or dentist markets can be expected to be highly regulated, which makes comparisons difficult. Results may, however, be well compared to tire dealers and druggists, both location based retailers. Most importantly, this comparison shows that while market power seems to decline relatively gradually with entry of the second and third firms for druggists[43] and tire dealers, this is not the case for Swiss newspaper sellers. The conclusion that two firms in a commune may be sufficient to ensure competition - or as the Dutch regulatory authority for telecommunications states "two are enough" (OPTA (2006)) - may therefore not apply in other retail markets.

***Coverage***

As has been shown before, the overall profitability of newspaper sellers strongly declines in the case of entry of a second newspaper seller in a commune. In what follows, the results in terms of coverage will be analysed.

[43] It should be noted that in the U.S. druggists usually also sell newspapers.

If a monopolist in a small commune would earn only the variable profits a duopolist would earn, i.e. if it would behave as competitively as a duopolist, it would only enter in communes with more than 921 potential customers (duopoly entry level demand). This means that the additional margin extracted by a monopoly newspaper seller on the whole range of its products allows communes with a market size below 921, but above 482 (the entry level the monopolist needs to enter) to have a single selling point instead of having none. In Switzerland, concretely, according to the above, entry for newspaper sellers is possible for a first monopoly firm (with monopoly competitive conduct) only with a minimum of 482 potential customers. 310 (out of about 2'700) Swiss communes exist, where, for their market size, entry is in no case viable even for a monopoly applying monopoly prices. About 80'000 people are living in such (very small) communes, corresponding to about 1% of the Swiss residential population. In case the first entrant would only earn duopoly profits, it would only enter at a minimal market size of 921. In such case 263 additional communes, inhabited by 164'000 people or 2,1% of the population, would not be able to sustain a selling point. Thanks to the higher variable profits that monopolies can earn in the free market, a newspapers selling point in these communes is sustainable, and coverage can be extended by 2,1% of the population.

While less competition may increase prices and lower static welfare, our model shows that it may also lead to an important and clearly quantifiable effect on sustainable total coverage (dynamic welfare), which also needs to be taken into account in case of any public policy intervention (competition-coverage trade-off). From a welfare point of view, in a marginal area which would not be served under more competitive conduct by monopolists, monopolistic pricing would increase welfare. At the same time, such a pricing policy may decrease static welfare in other (monopoly) areas. Considering the overall effects, it is unclear which situation would be socially optimal (monopoly or duopoly prices in monopoly areas). Such a trade-off also arises, for instance, in the telecommunications industry, where a regulator has to set access prices in monopoly and duopoly areas to ensure not only local competition but also sufficient investment incentives for coverage (see Bourreau, Cambini and Hoernig (2012)). When considering only press products, where margins are independent of entry or even increasing with entry, a situation with monopoly conduct of newspaper sellers (over a whole range over products) in monopoly areas would likely be socially preferred. It should be noted, however, that the social benefit of coverage for press products may then come at the cost of, for instance, higher food or fuel prices at newspaper selling points. In terms of total coverage with press products only, it is beneficial that a monopolist earns relatively high margins. Similarly, though, it is optimal in terms of welfare that these margins decline strongly with a second entrant, as coverage is already ensured and there is little potential for differentiation in distribution in this model.

The model proposed also has some limitations. Firstly, consumers' travel costs are not addressed. Typically, the consideration of such costs would argue for increased industry demand with successive entry. At the same time the assumption of fully independent demand between communes may not be given as markets may overlap. Further empirical research is necessary to address these issues.

# 8. Policy Recommendations

Depending upon the priorities of legislators different public actions are appropriate in the single copy newspaper distribution market. Coverage of the country with selling points is not only important for citizens to inform themselves, but also for potential new newspaper entrants (editors) to reach (new) customers efficiently. There could therefore be reasons to think that the presence of the first seller in a local market has positive externalities for the economy and therefore should be supported.

***Direct public intervention in the market***

One way to ensure the availability of newspapers in local market is by direct public intervention. The government could instruct the Swiss Post to sell local newspapers (again) in some post offices, and, if necessary, to reduce other free market product sales. To maximize welfare access to the Post's sales

infrastructure for publishers, wholesale distributors could also be granted access at regulated terms. As in telecommunications, though, a market intervention would likely only be justified in case of absence of (viable) competition. Otherwise, there is no need to enhance competition (and coverage) and any intervention would only distort competition. Absence of competition is at least given where in local markets entry of a newspaper seller is not viable. Our estimations show that this is the case in the 310 communes with a market size of less than 482. When looking at the actual data from the market, it can be seen that 405 communes inhabited by 210'000 or 2,7% of population are not served by a selling point in practice. Our model indicates, however, that in 95 more communes (covering about 130'000 inhabitants or 1,6% of population) entry would be economically sustainable.

The Swiss Post has intermittently sold newspapers in post offices. In 2007, it planned to offer newspapers in 470 post offices in the German-speaking part of Switzerland (out of about 2'600 in the whole country). Table 7 lists post offices where in 2007 selling points were set up (a full list was not published):

| | | **No potential entrant** | **One potential entrant** | **Two potential entrants** | **Three potential entrants** | **Four potential entrants** | **Five or more potential entrants** |
|---|---|---|---|---|---|---|---|
| **Trial post offices in 2007[44]** | **Estimation of S** | **S<482** | **482<S<1841** | **1841<S<3011** | **3011<S<4123** | **4123<S<5512** | **S>5512** |
| Aarau 1 | 32'519 | | | | | | X |
| Altdorf (UR) 1 | 11'918 | | | | | | X |
| Baden 1 | 31'650 | | | | | | X |
| Bern 1 | 203'368 | | | | | | X |
| Bern 14 | 203'368 | | | | | | X |
| Bern 18 | 203'368 | | | | | | X |
| Breitenbach (SO) | 4'602 | | | | | X | |
| Chur 4 | 41'540 | | | | | | X |
| Davos Platz 1 | 11'577 | | | | | | X |
| Domat/Ems | 7'743 | | | | | | X |
| Grenchen 1 | 2'271 | | | X | | | |
| Kreuzlingen 1 | 21'240 | | | | | | X |
| Landquart | 8'719 | | | | | | X |
| Laufen | 7'275 | | | | | | X |
| Luzern 1 | 87'718 | | | | | | X |
| Reinach 1 | 24'120 | | | | | | X |
| Romanshorn 1 | 11'896 | | | | | | X |
| Solothurn 2 | 27'711 | | | | | | X |
| Sulgen | 4'358 | | | | | X | |
| Winterthur 1 | 11'2819 | | | | | | X |
| Zug 1 | 39'017 | | | | | | X |
| Zürich 21 Sihlpost | 510'052 | | | | | | X |
| Zürich 27 Enge | 510'052 | | | | | | X |
| Zürich 47 | 510'052 | | | | | | X |

**Table 7 – Areas with post offices where selling newspapers; planned (Source: Swiss Post)**

From the previous analysis, it is clear that, when in a commune no entrant is economically sustainable, public competition would only slightly distort the market by decreasing the potential profit of the following entrant, which is, however, unlikely to ever enter the market.

When analyzing entry in a market where one firm can be active, these considerations change. Firstly, there is a potential or even actual alternative firm. By entering this market, the Swiss Post would

[44] Source: Swiss Post

(following the assumptions in our analysis) get half of the market in the event that an actual competitor is present, and the full market when, even though potential entry is possible, in reality there is no firm present. In the first situation, the Swiss Post enters directly in competition with private firms on the free market. Such an intervention should only be conducted when there are potential benefits. In this case the only possible justification for such an intervention could be that a single seller cannot ensure sufficient competition, and that a public firm must enter to safeguard competition. Considering the results of this paper, this is likely to be only the case in a one firm market. In the second situation, the Post takes the place of a competitor which could otherwise have been a private firm. Finally, when two or more entrants are potentially possible, it can be seen that the competitive situation is vastly improved. In such case neither reason of coverage nor of competition could justify a market intervention by the government, as it is likely that the market is already competitive. From the list of trial post offices, it can be seen that all selling points were set up in communes where multiple selling points are economically viable. However, no plans for this business have been made in small communes, where typically no private firm could enter, but where post offices are available, or where only one firm is present. In light of earlier results such public policy seems therefore distortive of competition and is - under the assumptions made in this paper - unnecessary to increase coverage or competition.

***Subsidies***

In addition to direct market intervention public policy consisted and still consists in subsidizing small local editors by reducing the postal service prices they pay in order to reach their subscribers. If national coverage with newspaper sellers were seen as a priority, then such subsidization could be extended to early delivery for both subscriptions and for newspaper sellers' supply. Such reimbursement should occur independently of the delivery operator (today this includes only delivery by the Swiss Post to newspaper subscribers, and excludes early delivery).

***Overall price levels***

In January 2013, a survey by Swiss consumer organisations showed that international journals are sold at high prices at Swiss newspaper selling points. In particular, the study showed that journal and magazine prices were 58% higher when bought at a Swiss newspaper selling point rather than at a German newspaper selling point (e.g. magazines like "GEO" or "Spiegel")[45]. Comparison with France shows a similar difference of 59%. Among Italian newspapers popular in the Italian-speaking part of Switzerland, the difference was even 107%. The emphasis on this subject in public debate could put legislators and the competition authority under pressure to act in order to reduce final prices.

If institutions would want to increase price competition for newspapers at the retail level, price flexibility could be enforced. In areas in which there is more than one seller, competition between sellers on final prices might be enhanced. Conversely, under the assumptions of the model (newspaper sales are only a small proportion of total sales and margins), coverage of newspaper selling points would not be affected by this measure. In addition, the price difference with neighbouring countries might rather hint at competitive problems in the wholesale market (Valora). In the case of dominance, possible interventions include interventions based on competition law or direct market interventions in the wholesale market by the Swiss Post.

# 9. Conclusions

This paper estimates competitive effects of entry in the Swiss newspaper sellers market as well as coverage following Bresnahan and Reiss (1991). A market is considered where such sellers sell composite products including a broad range of other products such as food and near-food for which largely free price-setting on retail level is possible. The methodology adopted allows estimation without

[45] preisbarometer.ch

necessitating price and quantity data, therefore being useful for application in markets where data is rare and the range of products under examination not entirely clear.

It is found that a monopoly seller can enter communes with market size above 482 and two duopoly sellers can enter when the market size is above 1'841. All N-oligopolies would need each about 1'000 potential additional customers to enter. Entry is shown to be unviable in communes corresponding to 1% of the Swiss residential population, while entry in an additional 2.1% is shown to be only viable when monopolies are able to freely set monopoly prices on the range of products sold. There is therefore a clearly quantifiable trade-off between market prices and total coverage (investment).

The model additionally shows that competition increases strongly with the entry of a second newspaper seller in the market, while further firms cannot add significant further competitive pressure. It is therefore concluded that in the Swiss newspaper sellers' market, two firms are enough to ensure competition. Related articles have used such results to conclude that proposed mergers between firms, reducing firms in the market to not less than two, would not reduce competition or harm consumers. The results of this paper are, however, also compared to other retail markets and it is found that these conclusions may not be valid, for instance, for tire dealers or druggists, where also a third entrant may significantly enhance competition.

Finally, current public policy in this field is assessed and it is found, that the past local entry of government controlled Swiss Post in the newspaper sellers' market would have concerned only areas where the model predicts that viable competition between two or more sellers is sustainable. Such public policy is judged negatively, as it can neither enhance competition significantly nor extend coverage, but risks distorting competition. Nevertheless, it is shown that there are 310 communes where such a policy would not distort competition and could enhance welfare.

# Bibliography


Abraham, J., Gaynor, M., & Vogt, W. B. (2007). Entry and competition in local hospital markets. *The Journal of Industrial Economics*, *55*(2), 265-288.

Ahlers, D. (2006). News consumption and the new electronic media. *The Harvard International Journal of Press/Politics, 11*(1), 29-52.

Argentesi, E., & Filistrucchi, L. (2007). Estimating market power in a two-sided market: The case of newspapers. *Journal of Applied Econometrics, 22*(7), 1247-1266.

Argentesi, E., & Ivaldi, M. (2005). Market Definition in the Printed Media Industry: Theory and Practice: *C.E.P.R. Discussion Papers*.

Bignon, V., & Flandreau, M. (2011). The Economics of Badmouthing: Libel Law and the Underworld of the Financial Press in France before World War I. *The Journal of Economic History, 71*(03), 616-653.

Bignon, V., & Miscio, A. (2010). Media bias in financial newspapers: evidence from early twentieth-century France. *European Review of Economic History, 14*(3), 383-432.

Blasco, A., & Sobbrio, F. (2012). Competition and commercial media bias. *Telecommunications Policy, 36*(5), 434-447.

Bourreau, M., Cambini, C., & Hoernig, S. (2012). Geographic Access Rules and Investment. *CEPR-Centre for Economic Policy Research, Discussion Paper Series, 9013*, 1-48.

Bresnahan, T.F., & Reiss, P.C. (1991). Entry and competition in concentrated markets. *Journal of Political Economy, 99*, 977-1009.

Bundesamt für Kommunikation. (2012a). Häufige Fragen zur Presseförderung.

Bundesamt für Kommunikation. (2012b). Titel der Regional- und Lokalpresse.

Bush, C.A. (2002). On the Substitutability of Local Newspaper, Radio, and Television Advertising in Local Business Sales. *FCC Media Bureau Staff Research Paper, 10*.

Carlyle, T. (1993). *On heroes, hero-worship, & the heroic in history*: University of California Press.

Chamberlin, E. (1933). The Theory of Monopolistic Competition. *Cambridge, Mass, Harvard University*.

Dertouzos, J.N., & Trautman, W.B. (1990). Economic Effects of Media Concentration: Estimates from a Model of the Newspaper Firm. *Journal of Industrial Economics, 39*(1), 1-14.

Dewenter, R. (2003). The economics of media markets. *University FAF Economics Discussion Paper*(10).

Ecoplan. (2010). Evaluation der Presseförderung seit 2008 und alternativer Modelle.

European Commission. (2010). News Corp/BSkyB, COMP Case M.5932.

Evdokimov, P. (2013). Nonlinear ordered probit estimation algorithm for Stata. Retrieved from http://www.econ.umn.edu/~evdok003/mle.do

Filistrucchi, L., Geradin, D., Damme, E.v., & Affeldt, P. (2013). Market Definition in Two-Sided Markets: Theory and Practice. *TILEC Discussion Paper No.* (9).

Freedom House. (2012). *Freedom of the Press*.

Inderst, R., & Valletti, T. M. (2007). A tale of two constraints: Assessing market power in wholesale markets. *European Competition Law Review*, *28*(2), 84.

Jefferson, T. (1787). *Letter to Colonel Edward Carrington*.

Latzer, M., Just, N., Metreveli, S., & Saurwein, F. (2012). Internet-Anwendungen und deren Nutzung in der Schweiz. Themenbericht aus dem World Internet Project: Universität Zürich.

M.I.S. Trend. (2009). Studie über den Internetanschluss und dessen Nutzung in der Schweiz.

Maddala, G.S. (1983). *Limited-dependent and qualitative variables in econometrics.* Cambridge University Press.

Montesquieu, C.d. (1751). The Spirit of the Laws. *11*, 69-70.

Nelson, P. (1970). Information and consumer behaviour. *The Journal of Political Economy*, *78*(2), 311-329.

Newspaper Association of America. (2012). The Single-Copy Value Equation.

Office of Fair Trading. (2009). Newspaper and magazine distribution in the United Kingdom - Decision not to make a market investigation reference to the Competition Commission, OFT1121.

OPTA. (2006). Is two enough? Economic Policy Note 6. Retrieved from https://www.acm.nl/en/download/publication/?id=9102

Ordover, J. (2007). Comments on Evans & Schmalensee's 'The Industrial Organization of Markets with Two-Sided Platforms'. *Competition Policy International Journal, 3*.

Organisation for Economic Cooperation and Development. (2012). Market Definition. DAF/COMP(2012)19.

Panzar, J.C., & Rosse, J.N. (1987). Testing for monopoly equilibrium. *The Journal of Industrial Economics, 35*(4), 443-456.
Salop, S.C. (1979). Monopolistic competition with outside goods. *The Bell Journal of Economics, 10*(1), 141-156.
Shapiro, C., & Varian, H. R. (1998). *Information rules* (Vol. 29). Boston: Harvard Business School Press.
U.S. Department of Justice. (2011). Dynamic Competition in the Newspaper Industry, Remarks as Prepared for the Newspaper Association of America.
Valletti, T. (2006). Mobile Call Termination: a Tale of Two-Sided Markets. *Communications & Strategies*(61).
Van der Wurff, R. (2011). Are news media substitutes? Gratifications, contents, and uses. *Journal of Media Economics, 24*(3), 139-157.
Youle, T. (2012). Nonlinear ordered probit estimation algorithm for Stata. Retrieved from http://www.econ.umn.edu/~youle001/nloprobit.do

# Annex: STATA12 algorithms to produce regression results, estimates and tests

**STATA ".do" file to produce Table 2:**

```
set more off
capture program drop nloprobit
program nloprobit
  args lnf S V1 a1 a2 a3 a4 a5 g1 g2 g3 g4 g5 F1
  tempvar P1 P2 P3 P4 P5
  qui gen double `P1'=normal(`S'*(`V1'+`a1')-`F1'-`g1')
  qui gen double `P2'=normal(`S'*(`V1'+`a1'-`a2')-`F1'-`g1'-`g2')
  qui gen double `P3'=normal(`S'*(`V1'+`a1'-`a2'-`a3')-`F1'-`g1'-`g2'-`g3')
  qui gen double `P4'=normal(`S'*(`V1'+`a1'-`a2'-`a3'-`a4')-`F1'-`g1'-`g2'-`g3'-`g4')
  qui gen double `P5'=normal(`S'*(`V1'+`a1'-`a2'-`a3'-`a4'-`a5')-`F1'-`g1'-`g2'-`g3'-`g4'-`g5')
  qui replace `lnf'=ln(1-`P1') if $ML_y1==0
  qui replace `lnf'=ln(`P1'-`P2') if $ML_y1==1
  qui replace `lnf'=ln(`P2'-`P3') if $ML_y1==2
  qui replace `lnf'=ln(`P3'-`P4') if $ML_y1==3
  qui replace `lnf'=ln(`P4'-`P5') if $ML_y1==4
  qui replace `lnf'=ln(`P5') if $ML_y1>=5
end

ml model lf nloprobit (lambda:  commuterIN, nocons offset(pop)) ///
                (beta:  inc old foreigners edu, nocons) ///
                /alpha1 /alpha2 /alpha3 /alpha4 /alpha5 ///
                /gamma1 /gamma2 /gamma3 /gamma4 /gamma5 ///
                (gammaL:blick=farmlpc, nocons)

ml search lambda 0 50 beta 0 1 alpha1 0 1 alpha2 0 1 alpha3 0 1 alpha4 0 1 alpha5 0 1 ///
              gamma1 0 1 gamma2 0 1 gamma3 0 1 gamma4 0 1 gamma5 0 1 gammaL 0 1
ml check
ml query
ml maximize, difficult

/*drop S1 S2 S3 S4 S5 s_1 s_2 s_3 s_4 s_5 s_21 s_32 s_43 s_54 betas ffracm lnhddm pincm eldm landvm*/
/*dist10kcity rent*/

qui egen incm=mean(inc)
qui egen oldm=mean(old)
qui egen edum=mean(edu)
qui egen foreignersm=mean(foreigners)
qui egen dist10kcitym=mean(dist10kcity)
qui egen rentm=mean(rent)
qui egen farmlpcm=mean(farmlpc)

qui gen betas=_b[beta:inc]*incm+_b[beta:old]*oldm+_b[beta:edu]*edum+_b[beta:foreigners]*foreignersm
qui gen S5=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b[gammaL:farmlpc]*farmlpcm]/[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5]_cons+betas]
qui gen S4=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]
qui gen S3=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons+betas]
qui gen S2=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[[alpha1]_cons-[alpha2]_cons+betas]
qui gen S1=[[gamma1]_cons+_b[gammaL:farmlpc]*farmlpcm]/[[alpha1]_cons+betas]

qui gen s_5=S5/5
qui gen s_4=S4/4
qui gen s_3=S3/3
qui gen s_2=S2/2
```

```
qui gen s_1=S1/1

qui gen s_54=s_5/s_4
qui gen s_43=s_4/s_3
qui gen s_32=s_3/s_2
qui gen s_21=s_2/s_1

display " S1  " S1  _newline " S2  " S2  _newline " S3  " S3  _newline " S4  " S4  _newline " S5  " S5 _newline
_newline  " s1  " s_1  _newline " s2  " s_2  _newline " s3  " s_3  _newline " s4  " s_4  _newline " s5  " s_5 _newline
_newline  " s21  " s_21  _newline " s32  " s_32  _newline " s43  " s_43  _newline " s54  " s_54
```

**Generation of estimates using state-dependent sample means (use after first .do file):**

```
. qui gen betas1=_b[beta:inc]*incm1+_b[beta:old]*oldm1+_b[beta:edu]*edum1+_b[beta:foreigners]*foreignersm1
. qui gen betas2=_b[beta:inc]*incm2+_b[beta:old]*oldm2+_b[beta:edu]*edum2+_b[beta:foreigners]*foreignersm2
. qui gen betas3=_b[beta:inc]*incm3+_b[beta:old]*oldm3+_b[beta:edu]*edum3+_b[beta:foreigners]*foreignersm3
. qui gen betas4=_b[beta:inc]*incm4+_b[beta:old]*oldm4+_b[beta:edu]*edum4+_b[beta:foreigners]*foreignersm4
. qui gen betas5=_b[beta:inc]*incm5+_b[beta:old]*oldm5+_b[beta:edu]*edum5+_b[beta:foreigners]*foreignersm5
. qui gen
S5new=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b[gammaL:farml
pc]*farmlpcm5]/[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5]_cons+betas5
> ]
. qui gen
S4new=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm4]/[[
alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas4]
. qui gen
S3new=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm3]/[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons+betas3]
. qui gen S2new=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm2]/[[alpha1]_cons-
[alpha2]_cons+betas2]
. qui gen S1new=[[gamma1]_cons+_b[gammaL:farmlpc]*farmlpcm1]/[[alpha1]_cons+betas1]
. qui gen s_5new=S5new/5
. qui gen s_4new=S4new/4
. qui gen s_3new=S3new/3
. qui gen s_2new=S2new/2
. qui gen s_1new=S1new/1
. qui gen s_54new=s_5new/s_4new
. qui gen s_43new=s_4new/s_3new
. qui gen s_32new=s_3new/s_2new
. qui gen s_21new=s_2new/s_1new
. display " S1  " S1new  _newline " S2  " S2new  _newline " S3  " S3new  _newline " S4  " S4new  _newline " S5  "
S5new _newline _newline  " s1  " s_1new  _newline " s2  " s_2new  _newline " s3
>  " s_3new  _newline " s4  " s_4new  _newline " s5  " s_5new _newline _newline  " s21  " s_21new  _newline "
s32  " s_32new  _newline " s43  " s_43new  _newline " s54  " s_54new
```

**STATA ".do" file to produce tests**

```
. testnl ([ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alp
> ha5] _cons+betas]]=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]])
>       ([[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]=[[gamma1]_
> cons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]])  ([[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL
> :farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]]=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1] _cons-
[alpha2]_cons+betas]])
>     ([[gamma1] _cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1]_cons-
[alpha2]_cons+betas]]=[[gamma1]_cons+_b[gammaL:farmlpc]*farmlpcm]/[1*[[alpha1] _cons+betas]]
> )

  (1)  [ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5
```

```
> ] _cons+betas]] = [[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]
  (2)  [[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]] = [[gamma1]_c
> ons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]]
  (3)  [[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-
[alpha2]_cons- [alpha3]_cons+betas]] = [[gamma1]_cons+[gamma2]_cons+_b[gammaL:
> farmlpc]*farmlpcm]/[2*[[alpha1] _cons-[alpha2]_cons+betas]]
  (4)  [[gamma1] _cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1]_cons-[alpha2]_cons+betas]]
= [[gamma1]_cons+_b[gammaL:farmlpc]*farmlpcm]/[1*[[alpha1] _cons+betas
> ]]

          chi2(4) =      35.32
        Prob > chi2 =     0.0000

. testnl ([ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alp
> ha5] _cons+betas]]=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]])
>       ([[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]=[[gamma1]_
> cons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]])  ([[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL
> :farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]]=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1] _cons-
[alpha2]_cons+betas]])

  (1)  [ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5
> ] _cons+betas]] = [[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]
  (2)  [[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]] = [[gamma1]_c
> ons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]]
  (3)  [[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-
[alpha2]_cons- [alpha3]_cons+betas]] = [[gamma1]_cons+[gamma2]_cons+_b[gammaL:
> farmlpc]*farmlpcm]/[2*[[alpha1] _cons-[alpha2]_cons+betas]]

          chi2(3) =      1.42
        Prob > chi2 =     0.7013

. testnl ([ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alp
> ha5] _cons+betas]]=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]])
>       ([[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]=[[gamma1]_
> cons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]])

  (1)  [ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5
> ] _cons+betas]] = [[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]
  (2)  [[gamma1]
_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]*farmlpcm]/[4*[[alpha1]_cons-
[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]] = [[gamma1]_c
> ons+[gamma2]_cons+[gamma3]_cons+_b [gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-[alpha2]_cons-
[alpha3]_cons+betas]]

          chi2(2) =      0.21
        Prob > chi2 =     0.8984
```

```
. testnl ([ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alp
> ha5] _cons+betas]]=[[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]])

  (1)  [ [gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+[gamma5]_cons+_b
[gammaL:farmlpc]*farmlpcm]/[5*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons-[alpha5
> ] _cons+betas]] = [[gamma1]_cons+[gamma2]_cons+[gamma3]_cons+[gamma4]_cons+_b[gammaL:farmlpc]
*farmlpcm]/[4*[[alpha1]_cons-[alpha2]_cons-[alpha3]_cons-[alpha4]_cons+betas]]

           chi2(1) =       0.08
         Prob > chi2 =       0.7729

. ([[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-
[alpha2]_cons- [alpha3]_cons+betas]]=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:farmlp
> c]*farmlpcm]/[2*[[alpha1] _cons-[alpha2]_cons+betas]])    ([[gamma1]
_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1]_cons-
[alpha2]_cons+betas]]=[[gamma1]_cons+_
> b[gammaL:farmlpc]*farmlpcm]/[1*[[alpha1] _cons+betas]])
unrecognized command:  ( invalid command name
r(199);

. testnl([[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-
[alpha2]_cons- [alpha3]_cons+betas]]=[[gamma1]_cons+[gamma2]_cons+_b[gammaL:
> farmlpc]*farmlpcm]/[2*[[alpha1] _cons-[alpha2]_cons+betas]])    ([[gamma1]
_cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1]_cons-[alpha2]_cons+betas]]=[[gamma1]_
> cons+_b[gammaL:farmlpc]*farmlpcm]/[1*[[alpha1] _cons+betas]])

  (1)  [[gamma1] _cons+[gamma2]_cons+[gamma3]_cons+_b[gammaL:farmlpc]*farmlpcm]/[3*[[alpha1]_cons-
[alpha2]_cons- [alpha3]_cons+betas]] = [[gamma1]_cons+[gamma2]_cons+_b[gammaL:
> farmlpc]*farmlpcm]/[2*[[alpha1] _cons-[alpha2]_cons+betas]]
  (2)  [[gamma1] _cons+[gamma2]_cons+_b[gammaL:farmlpc]*farmlpcm]/[2*[[alpha1]_cons-[alpha2]_cons+betas]]
= [[gamma1]_cons+_b[gammaL:farmlpc]*farmlpcm]/[1*[[alpha1] _cons+betas
> ]]

           chi2(2) =      20.17
         Prob > chi2 =       0.0000
```