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Horizontal market concentration: Theoretical insights from the spatial models

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Abstract

This paper aims to further advance the study of horizontal mergers by critically reviewing the theory on spatial models that may be used for the analysis of horizontal market concentration. We examine the incentives conveyed by locations for undertaking merger and merger-related strategies, as well as the impact of merger on strategic location choices. Thereby this paper highlights the two-way relationship between market concentration behavior and firm location.

JEL classification: D43, L41, R32

Keywords: geographic and product space, strategic location, horizontal market concentration, merger control

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1. Introduction

Quoting the Allianz AG investor relations news[1] dated September 11, 2005, "...the full acquisition of Riunione Adriatica di Sicurtà S.p.A. will enable Allianz in the future to reorganize its Italian activities and to directly reallocate the holdings of operations to Allianz Holding in key European markets[...]." This merger arguably opened opportunities to reduce the complexity of the entire Group, as became clear in 2006. According to the investor relations news from June 22, 2006,

> "Allianz plans to introduce a new operating model and merge locations within Germany[...] to make its insurance business even more client-focused, to operate more efficiently and achieve growth. By the end of 2008 the group intends to have introduced a new business model which will include an updated concept for geographical locations[...] there will be cost savings of between 500 to 600 million euros from which both clients and shareholders will profit[...]Allianz is planning to cut back the number of administrative locations in Germany from the current twenty one to ten."

Post-merger spatial repositioning is common business strategy, although not necessarily in its geographical sense. Berry and Waldfogel (2001) examined the major radio station consolidation wave in the US prompted by the natural experiment of the 1996 Telecommunications Act, which substantially relaxed previous ownership restrictions in the industry. Using a panel data set on 243 US radio broadcast markets before and after the Act (in 1993 and 1997), they find that concentration reduces station entry, but, holding the number of stations constant, increases product variety. In addition, jointly-owned stations are found to be more likely to broadcast in similar formats than independent unrelated ones. In other words, mergers trigger product specification changes, and the study recommends that "antitrust authorities considering radio mergers might want to take such effects into account when they try to anticipate the effect of mergers on overall welfare".

A spatial analysis of mergers is therefore likely to provide further insight for both merger incentives and consequences, as well as for the possible reply of competition authorities in terms of merger control. This paper attempts to bring support in favor of these statements, in light of results obtained in spatial competition models.

[1] For details see the Allianz AG website

Distance, either in its geographic or product specification meaning, gives rise to differentiation. Branded consumer products are easy examples of differentiation within the product range, and physical facilities that distribute or deliver goods or services, such as supermarkets, department stores, branch banks, or hospitals, give rise to differentiation based on location. Even in a classic homogeneous-goods market (such as the market for an agricultural commodity or for a specific chemical compound) producers do differentiate themselves spatially. To a greater or lesser degree, virtually all markets involve some element of product differentiation.

From a positive standpoint therefore, the economic analysis of mergers in oligopoly markets needs to take into account such product repositioning or geographical (re)shaping of a distribution network following horizontal market concentration, as mentioned in the above examples. To address such consequences of mergers, a spatial framework appears necessary. However, the spatial setting can equally provide a consistent framework to examine firm behavior induced by a given spatial setting. More precisely, particular location patterns for production or distribution outlets of merger partners and various degrees of product differentiation within their product range provide different incentives to merge, to monopolize the market, to free-ride on a merger between rivals, or to prevent the market entry of rivals after merger. And since mergers do trigger location choices, as the above examples remind, spatial models are helpful in predicting whether more or less geographical agglomeration (or more or less product diversity) is (are) to be expected. Furthermore, a spatial analysis can assess the spatial repositioning/product design choices made by firms in anticipation of mergers, and as such may contribute to the antitrust market analysis.

From a normative point of view, the insight provided by a spatial merger analysis will necessarily improve the outcome of merger control. To put it short, mergers lead to structural changes in a market, and the equilibrium which emerges following a merger is likely to differ from that which prevailed before. The purpose of merger control is to assess the nature of the likely post-merger equilibrium and to make a welfare comparison between this expected outcome and the pre-merger situation. In making such a comparison, the main variable of interest is likely to be the level of post-merger price(s) compared to pre-merger one(s), given the current focus of merger control on consumer welfare. This typically involves answering three questions. Would prices be expected to rise significantly if there were no cost savings from the merger and there were to be no new entry or product repositioning by rivals? Will entry or product repositioning thwart any attempt to raise

prices? What is the likely impact of the merger on costs? Spatial models can arguably provide answers to all these questions, and not only. Even before weighing the possible cost savings and other consequences from relocation/repositioning, the very antitrust assessment of the merger's effects actually begins by defining the relevant geographic and/or product market, for which more often than not a spatial analysis is welcome.

In all cases, firm behavior and firm location appear to be related and important for the economic analysis of horizontal mergers, both from a positive and a normative point of view. This paper will thus review the theoretical literature dealing with horizontal mergers in a spatial setting by focusing on the two-way relationship between firms' locations and their behavior. We first explore the incentives conveyed by locations for undertaking merger and merger-related strategies, then go on to address the impact of merger on strategic location choices.

However, before doing so, the formal background of spatial models will be discussed next. The various modelling assumptions having different implications for the ultimate outcome of the spatial analysis, presenting them first is useful for pinning down later the origin of the location and/or behavior effects that are dealt with in the merger literature.

2. Modeling framework for horizontal mergers in a spatial setting

The literature on horizontal mergers in a spatial setting relies on oligopoly as well as strategic location models. The predictions of both are highly sensitive to assumptions. It would be inappropriate to take a single model of oligopoly behavior in a given spatial paradigm and attempt to interpret market behavior or draw generalized policy conclusions from it. To better grasp the various characteristics of the different analytical models used to perform a spatial analysis of horizontal mergers, the following paragraphs briefly discuss their main ingredients.

Spatial representation of the market

Any spatial model of mergers necessarily builds on a given pre-merger location equilibrium, which more often than not concerns either the linear or the circular market. These geometric analogies are the most frequent and tractable ways to model spatial differentiation, be it geographical or within a product range. Hotelling's (1929) ice-cream sellers moving along a linear beach recall that a segment-like spatial representation allows for differentiation through location. A set of consumers with preferences defined over a set of goods can also be formalized by such a location

model, as long as it is possible to order the different brands. Consumers' disutility in putting up with less than their ideal variety will then be modeled as a transport or tariff cost.

The linear market assumption turns up more frequently because locations are *a priori* heterogenous on the segment, which makes it interesting to determine location patterns arising from various market characteristics. However, the circular framework is more appropriate for certain real-life situations. Typical examples are circular towns spreading around lakes, for which consumers cannot generally afford to cross the lake when going shopping, and therefore department stores take up their locations around the lake. More generally speaking, this basically occurs for every traffic-jammed city - large shopping malls are located on the outskirts, on the circular beltway, so as to avoid consumers the downtown traffic[2]. Still, in terms of product specification, the linear representation is often preferred because it applies to single-peaked consumer's preferences, whereas no such analogy is available for the circular model.

Market interaction

The choice to model price rather than quantity competition is equally important for the merger analysis, and basically depends on the nature of the product considered. From a theoretical point of view, as shown by Kreps and Scheinkman (1983) in a non-spatial framework, the Cournot equilibrium is equivalent to the outcome of a two-stage game where firms set quantities first and then compete in prices. Consequently, Cournot competition is relevant when the quantity (or capacity) decision of the first stage is inflexible, i.e. fixing prices is easier than modifying capacities or adjusting quantities.

In a spatial context, firms often decide on their aggregate output but also on the quantity to allocate to different submarkets. Hence the Cournot assumption appears reasonable when both total capacity and spatial allocation of output are relatively inflexible. Typically, such a rigid spatial distribution of the firm's sales is consistent with the setting where firms ship/deliver output from a production plant to various outlets/consumer locations. In turn, if a product's price is heavily advertised (like catalog stores), price changes involve a substantial cost for firms. Prices are the relevant choice variable in this case, so Bertrand competition is more realistic. This makes price competition quite popular with consumption goods and the related shopping behavior on behalf

[2]Furthermore, the dial of a clock being a circle, the circular market can be used for competing television networks choosing time slots for their shows, or airlines choosing arrival and departure times for their flights.

of consumers. Still, the Cournot assumption is relevant on a larger scale than the above examples imply. From a theoretical point of view, Cournot spatial models have attractive features in their predictions: whereas Bertrand competition yields exclusive sales territories for firms[3] (consumers at each location are served only by the most cost-efficient firm there), Cournot competition exhibits market overlapping with intra-industry trade, which often does fit reality better - see Phlips (1983) and McBride (1983). In any case, the intensity of the market rivalry will prove essential for the ultimate spatial pattern characterizing the merger equilibrium.

The spatial pattern generally depends also on the spatial pricing policy. A major contribution of the literature on strategic location in oligopoly was precisely to show that a connection necessarily exists between the location market equilibrium and firms' pricing policies. Two alternatives are basically possible, either spatial price discrimination[4] or nondiscriminatory pricing. The latter occurs whenever two varieties of a product are sold by the seller to different buyers at the same net price, which is the price paid by a buyer corrected for the product differentiating cost (Phlips (1983), p.6)). Consequently, the only nondiscriminatory spatial pricing is the mill f.o.b. (free-on-board) pricing, which has all consumers pay the same mill price and then pay the full transport cost to their own consumption locations. In turn, spatial price discrimination can occur under two equivalent forms: either through the charging of different mill prices to buyers at different locations, or through delivered prices at which the product will be supplied at the various local markets.

The spatial literature combines these assumptions on intensity of competition and spatial pricing policies in two principal alternative paradigms, the so-called shopping and shipping models. Assuming mill pricing and letting consumers in charge of the transport cost represent the basic assumptions of the former, more often than not associated with Bertrand competition. In turn,

[3] Price competition with homogenous product in spatial markets always implies non-overlapping market areas for competitors.

[4] Price discrimination occurs whenever price differences do not result from generalized (i.e. accounting for transport) production cost differentials. According to the standard microeconomic theory, a firm may discriminate in price if it can separate its overall market into several distinct submarkets between which demand elasticity varies. 'Space' is the most natural criterion to separate consumer markets, with 'distance' standing for tariff costs, or waiting time, or storage costs, or product differentiation. In addition, distance costs generate varying demand elasticities between spatially separated markets, even if demands are identical everywhere. As a result, as long as firms control the means of market separation, in absence of institutional or legislative constraints, spatial price discrimination may naturally arise instead of nondiscriminatory pricing.

modelling firms that transport goods to observable consumer locations and thereby spatially discriminating customers corresponds to the shipping model, which is usually combined with Cournot competition. The choice of one framework over the other depends on whichever fits better the situation examined[5].

3. Impact of location on horizontal mergers

This section attempts to argue that the spatial framework can contribute to better explain merger incentives and merger-related strategies. It will largely dwell on the internal profitability issue, prompting questions as to which firms are more likely to merger in a market, as well as on the associated behavior from rivals or non-merging firms, who are often witnessed to free-ride on a merger, i.e. benefit from the price raise and gain market shares at the expense of the merging partners. Such issues require the formal analysis to use results obtained in strategic location models, which will therefore be presented first in what follows.

3.1. Basic insights from strategic location theory

A major contribution of the strategic location theory was to establish that a firm's optimal location is generally determined by its pricing strategy, the shape of the individual demand, the form of the delivery cost functions, the conjectural variations of the competitors, the particular distribution of consumers, and the degree of competition in the industry. The abundant literature on strategic location gradually studied the impact of all these factors on the ultimate spatial equilibrium, with one conclusion being soon obvious: results are quite sensitive to assumptions. Still, a firm's location decision always results from the same general trade-off, between agglomeration and dispersion forces. Intense competition typically generates dispersion, but 'be where demand is' gives common incentives to cluster, just like possible strategic interactions (positive externalities

[5] For instance, market segmentation as resulting from discriminatory delivered pricing in the shipping framework enables profit maximization behaviour to be considered separately for each local market. This is particularly relevant for the international location case, where arbitrage costs between locations are likely to be high. A shipping model can furthermore approximate the mechanism of flexible manufacturing described by Eaton and Schmitt (1994), where the basic product (the location of the firm) is customized at a certain cost (the shipping cost) to make it available to consumers. In turn, the shopping mill pricing model is realistic when consumer's location/most preferred variety not easily identifiable.

among firms, or the existence of a market center). At any rate, strategic location models are always concerned with minimizing overall transport costs, and the trade-off between agglomeration and dispersion is settled by firms choosing their distance to each consumer's location so as to maximize profits.

Hotelling's (1929) pioneering contribution concluded on the principle of minimum differentiation or, equivalently, central agglomeration within the Bertrand mill pricing shopping model on the linear city. Yet, with linear transport cost and uniform consumer distribution on the unit line, the price competition stage of the duopoly sequential location-price game is actually not well behaved, and eventually d'Aspremont et al. (1979) showed that if firms are located near the segment mid-point, a pure-strategy price equilibrium fails to exist[6].

However, with quadratic transport cost the location-price problem becomes tractable again, and maximum differentiation obtains instead, with firms locating at the market endpoints (see d'Aspremont et al. (1979)). Basically, this stems from the need for firms to locate as far as possible from each other so as to avoid triggering a price undercut from the rival and thus soften the intense price competition. Still, the product homogeneity can be questioned, and a supplementary product differentiation dimension is enough to mitigate the extreme dispersion outcome[7]. Shopping models with Bertand competition on the linear market restore the minimum differentiation result, provided transport costs are not too high and products sufficiently differentiated along some other dimension[8]. By the same token, the pricing policy assumption was questioned, as well as the possibility of rational undercutting without fear of retaliation. Moreover, the existence of endpoints on the bounded linear market gives rise to some difficulties concerning the existence of pure-strategy equilibrium, especially when more than two firms compete in the market[9]. This prompted the use

[6] Demand and profit functions are both discontinuous for close enough locations, and profits are not quasi-concave due to the possibility of price undercutting. Hotelling's central clustering result remains valid as long as prices are fixed and identical for both firms, because the incentive to differentiate products decreases when firms do not actually compete in prices.

[7] The nonspatial price competition model allows nonzero equilibrium profits if products are differentiated. The resulting lower intensity of competition gives more weight in a spatial setting to transport cost minimization, and firms can agglomerate to better serve demand.

[8] See Irmen and Thisse (1998) and de Palma et al.(1985) for models with a supplementary product differentiation dimension.

[9] See for instance Economides (1993) for a nonexistence result for more than three firms in the sequential location-

of the alternative circular space assumption. The circular city was pioneered by Vickrey (1964) in its modern version[10], yet made popular by Salop (1979) through his analysis of free market entry equilibrium and socially optimal degree of differentiation. His model postulated the symmetric equidistant location by oligopolists on the circular market, which, although highly intuitive, was only shown to be an equilibrium later. Economides (1989) provided existence and uniqueness results in the circular location-then-price model with quadratic transportation costs, while Kats (1995) obtained the equidistant location pattern as a location-price equilibrium for a duopoly with linear transport cost, and finally De Frutos et al. (1999) established the equidistant pattern as an equilibrium for a larger class of transport cost functions.

Although price competition does occur on a large scale, the alternative quantity competition assumption is equally realistic. Given the empirically confirmed relevance of the Cournot assumption[11], an increasing bulk of the location theory literature built on it. Salant (1986) examined perfect equilibrium existence in a shopping model on the segment market by allowing firms to enter and choose locations one at a time, before competing in quantities[12]. The spatial pattern thus obtained does not have firms equally spaced, nor making equal profits, although symmetry w.r.t. the mid-point may apply. More importantly, Salant (1986) equally shows that the equilibrium may fail to exist when simultaneous location-quantity choices[13] are considered instead, much as in the price model, due to the profit function discontinuity. As a result, the location pattern for spatial Cournot competition has typically been studied in the sequential location-then-quantity competition framework[14].

Assuming linear transport costs and identical linear inverse demands for consumers uniformly

price model on Hotelling's line.

[10] An earlier version is due to Lerner and Singer (1937).

[11] See Salant (1982) for the world electricity market and McBride (1983) for the American cement market.

[12] The sequence of moves and the Cournot assumption guarantee the continuity and (quasi)concavity of profits, and thereby equilibrium existence.

[13] There are cases where changing the firm's position in the product range (typically, the colour, or Hotelling's example of cider sweatness) is virtually costless, so location and output choices are basically simultaneous.

[14] In spatial models, when dealing with the choice of physical locations, it is not out of place to suppose that a firm must settle on a location before deciding on the output level. Similarly, when a firm's location decision represents its choice within a product space, it is frequent that location (i.e. product design) must be chosen before prices and/or output levels be selected. For many differentiated product oligopolistic industries where durable and product specific inputs must be acquired prior to production, location decisions naturally precede quantity choices.

distributed on the unit segment, Hamilton et al. (1989) obtain the existence of a unique equilibrium pattern of central agglomeration for a two stage location-quantity duopoly game. The result is extended to convex transport costs and moreover, generalized to n firms in the case of linear transport costs by Anderson and Neven (1991), which has virtually become since the building framework of the mainstream spatial Cournot analysis[15]. It should be noted that besides providing theoretical foundation for the common observation that firms selling similar products frequently agglomerate in space, Hamilton et al. (1989) and Anderson and Neven (1991) incidentally claim that an alternative way of modelling inter-firm rivalry than price competition can *per se* provide a reason for agglomeration.

Much of the subsequent literature on spatial Cournot competition tested the robustness of this result. Hamilton et al. (1994) study the same duopoly location-Cournot game on the segment, but with mill f.o.b. pricing and shopping behavior instead, only to revive a well-known equilibrium existence problem (as a result, the perfect equilibrium of the two-stage game yields almost (but not exactly) central agglomeration). Besides the pricing policy, demand and cost factors equally challenge the central clustering result. Gupta et al. (1997) consider different types of demand distribution and prove that a necessary condition for agglomeration to occur at a given point in space is that the density of demand be sufficiently high at that location[16]. Mayer (2000) reminds that strategic location requires minimizing total delivered costs to consumer locations, which include production costs. He shows that transport and production costs do not weigh equally within the location choice decision, and gives the two alternative necessary conditions that enable central agglomeration: either the production cost distribution be uniform, or such that production cost be minimized at the middle of the segment. Thus, Anderson and Neven's (1991) result is also explained by the fact that production costs are identical at all locations. Finally, Anderson and Neven's (1991) uniqueness result is to be put down to the particular assumption concerning the shape of the spatial market. With constant marginal delivery cost, a necessary condition for a given location to be optimal is to satisfy the quantity-median property, meaning that for that location,

[15] Their paper draws attention to the demand assumptions leading to this outcome: the linearity and a sufficiently high reservation price. The former ensures profit quasiconcavity, and hence equilibrium existence, while the latter rules out local monopolies.

[16] Hence, the central agglomeration outcome is explained by the symmetry of the uniform distribution initially assumed, whereas a multi-modal distribution could sustain several distinct clusters on the segment.

total quantity supplied to the left must equal that supplied to the right[17]. Clearly, for a location equilibrium pattern, all firms must be located at their quantity-median point, and since the segment market is exogenously bounded, the quantity-median location is identical and unique for all firms.

A growing body of articles chose instead to model the circular city, with two main findings: multiple equilibria obtain generally, none involving complete agglomeration. Pal (1998) was the first to point out the latter for the symmetric duopoly on the circular city. He found that firms disperse at the opposite ends of a diameter, and therefore that the shipping Cournot model can be consistent with the maximum differentiation principle. Matsushima (2001,a) increased the number of firms on the market to obtain instead partial agglomeration-dispersion, with firms dividing into two equidistant clusters located at the opposite ends of a diameter. Shimizu and Matsumura (2003) completely generalize the framework, to show that complete agglomeration cannot possibly be sustained in equilibrium on the circle, and identify other equilibrium location patterns[18].

The circular model is thus consistent with an appealing partial clustering result, given the common observation of firms agglomerating in several major business areas, each involving a different number of competitors. However, the multiple equilibria property raises questions as to the model's predictive powers, all the more so that not all equilibria have yet been characterized. Still, the circular model unravels one further important insight into the origin of the initial agglomeration result obtained by Anderson and Neven (1991). Complete agglomeration cannot be obtained on the circle due to the product homogeneity assumption, which implies strategic substitutability for quantity competition, and makes agglomeration reduce output for every firm in the cluster. Spatial Cournot competitors would naturally disperse to maximize profits, but this is not possible on the segment, where the exogenous borders impose the same most-preferred transport cost minimizing location to all competitors. Without this dominant intrinsic agglomeration force, Cournot firms selling a homogenous product can and do disperse on the circle[19].

[17] A firm's profit is proportional to the square of the quantity supplied on the market, so this is merely a translation of a firm's First Order Condition on its total profit over the set of spatially segmented markets.

[18] Gupta et al. (2004) further confirm and extend the multiple equilibria property, by showing that firms tend to locate pair-wise on the circle in various spatial patterns, partially agglomerating at distinct locations, often in a non-equidistant equilibrium, and possibly in a continuum of location equilibria.

[19] The point was definitely settled by Shimizu (2002) and Yu and Lai (2003), who allow for product differentiation (each firm shipping one variety) within the original Cournot duopoly on the circular market. With perfect substitutes, Pal's (1998) equidistant result is confirmed, but in the case of complements, which imply that a firm sells more at

To sum up the theoretical results reviewed so far, the spatial equilibrium necessarily yields dispersion if firms compete in prices, and may involve complete agglomeration, partial clustering or even complete dispersion if instead firms compete in quantities, depending on the market's characteristics.

3.2. Merger analysis and antitrust insights

The main findings from location theory reviewed in the previous paragraphs are relevant for a spatial merger analysis to the extent that they can be used to characterize the initial pre-merger spatial market equilibrium, which represents the first step of an explicit merger assessment. We turn now to the literature focusing on mergers in a spatial setting, and examine the behavior incentives induced by a given spatial pattern.

When studying the incentives for (and, equally, the consequences of) market power increases in a spatial setting, considering fixed locations provides basic insight, besides being the simplest modeling framework available. In a sense, the fixed-location merger models were the initial extension of the non-spatial analyses, and the earliest spatial contributions to the horizontal merger literature basically checked for and extended results obtained in non-spatial models.

One of the main findings of the latter, and possibly the most quoted, is the so-called merger profitability paradox. Despite the recurrent merger waves, both theoretical and empirical studies indicate that often merging partners incur a profitability loss, whereas outsider firms experience a profitability raise following the merger. More precisely, the profitability loss for insiders can be so high as to question the very incentive to merge in the first place. The theoretical literature pointed out that the intensity of the paradox actually depends on the underlying assumption on market competition, to the extent that in non-spatial models, Salant et al. (1983) concluded on the lack of private incentives to merge for identical Cournot firms producing a homogenous good with constant unit production cost, unless their combined market shares amount to at least 80%[20]. Deneckere and Davidson (1985) revealed in turn that a merger is always internally profitable for Bertrand producers of differentiated goods, at least if entry is not an issue. In the first model, since quantities

the rival's location, firms necessarily cluster.

[20] Also, absent market entry and without cost savings - for a more general Cournot model see Szidarovsky and Yakovitz (1982).

are strategic substitutes, an output contraction by insiders triggers an output expansion by rivals, while in the latter, prices being strategic complements, the insiders' price raise is matched by a similar price increase on behalf of the outsiders[21]. In both cases, as signalled by Stigler (1950), the outsiders benefit more than the insiders from the merger, and this free-riding effect may eventually prevent the merger if the decision to merge is endogenized.

As already mentioned, spatial differentiation is substitutable to product differentiation, so it should not come as a surprise that horizontal Bertrand mergers in spatial models basically yield the same results as in non spatial models. Levy and Reitzes (1992) consider bilateral (profitable, of course) horizontal mergers between neighboring Bertrand competitors in Salop's (1979) model and check that outsiders make lower profits than insiders, except for the two adjacent firms, whose profits increase. This is due to the assumptions of shopping behavior and nondiscriminatory mill pricing, which imply together that competition is asymmetric and strongly localized. In this model, a firm only competes directly with its two neighbors[22], so it gives up merging only if it anticipates that any of its neighbors will merge, because the free-riding effect is restricted to the two closest neighboring firms. Reitzes and Levy (1995) show instead that if firms can spatially price discriminate, this free-rider problem vanishes. Within a shipping model with symmetric Bertrand competitors which price discriminate spatially, they find that the equilibrium prices of outsiders are not affected by a merger (of course, profitable) between neighboring firms, but they increase for consumers located between the insiders. This is due to the fact that in markets with spatial discrimination, a firm's price strategy is dictated by the delivered cost of its adjacent rivals, so only mergers between neighboring firms influence price[23].

The fact that the pricing strategy of a product line over a geographic area largely depends on the intensity of the local competition that each individual firm, store or brand faces, basically suggests that it can be strategically advantageous for a multiproduct firm (resulting from a horizontal merger typically) to base its pricing policy on the degree of substitutability between own brands and those offered by rivals. Using the standard (i.e. shopping behavior with quadratic transport

[21] Gaudet and Salant (1992) also stressed the role of the strategic complementarity for the existence of the paradox.

[22] In contrast, Deneckere and Davidson (1985) assume that varieties are imperfect substitutes and each firm competes symmetrically with all rivals.

[23] The ability to discriminate is compatible with the localized asymmetric competition, since insiders choose delivered prices so as to prevent any free-riding from their neighbors.

cost) circular model of product differentiation with Bertrand competition, Giraud-Héraud et al. (2002) consider mergers between a multi-product firm selling a group of connected brands and one single-store/product competitor. Assuming fixed symmetric equidistant locations for all brands around the circle, they find that the merger with an adjacent competitor is increasingly profitable as the number of brands controlled by the group grows larger and larger. Moreover, due to the asymmetric pricing policy devised by the group, closely-substitutable target brands experience a profit increase, so the free-riding problem is absent for the group's closest neighbors.

Giraud-Héraud et al. (2002) stress that profits vary among the group's brands, depending on the exposure to competition from fringe competitors, and equally suggest that the latter may more or less benefit from the free-riding effect in case of merger. This suggestion is exploited by Brito (2003), who reminds that often outsiders-to-be may abandon the passive free-rider behavior to try to prevent a merger. This might appear puzzling, but is explained by the fact that firms may engage in preemptive mergers to avoid becoming profit-loosing outsiders of alternative mergers. Brito (2003) obtains this result by endogenizing the decision to merge in Levy and Reitzes's (1992) model, and thereby actually unveils a possible rationale for unprofitable mergers to occur.

Matsushima (2001,b) equally investigates endogenous sequential mergers, but between four identical firms in the circular-city shipping Cournot model. Although the main motivation of the paper is to study merger waves, it also obtains that a merger between neighboring Cournot competitors is unprofitable. This amounts to extending the merger paradox in spatial Cournot models, despite the supplementary feature of spatial product differentiation. Indeed, with Cournot competition and spatial discrimination, each point in space is an independent local market supplied by all firms, proportionally to the distance from their own locations. To get rid of overlapping market areas, and to minimize transport costs, one of the insiders stops supplying at those locations where it does not have the lowest marginal delivered cost, hence an output contraction for the merged entity. Thus the non-spatial model obtains at each local market, as first pointed out by Norman and Pepall (1998). Their paper is a reply to McAfee et al. (1992), who alleged that Cournot horizontal concentration would prove profitable in the spatial setting simply because the merged entity is 'larger' than the outsiders: indeed, it continues to operate two distinct outlets, contrary to the Salant et al. (1983) symmetric non-spatial model, where it shrinks to the size of

an outsider[24].

Matsushima's (2001,b) primary purpose was to study merger waves, and from this point of view, the paper finds that if the transportation cost per length is sufficiently large w.r.t. the market size, then a wave of profitable mergers occurs, eventually leading to the market monopolization. Giraud-Héraud et al (2002) also hint at this, since for the group of brands, acquiring an adjacent single-product firm is all the more profitable that its number of brands is large. This reminds that it takes a strong free-riding effect on behalf of the outsiders to contain the monopolization incentive.

Hold-up of pro-competitive and welfare enhancing mergers is of course not desirable. However, since many mergers are on the contrary anti-competitive, the free-riding can actually save time and money for competition authorities. Thus, in the model considered by Levy and Reitzes (1992), the outsiders' free-riding can discourage price-increasing mergers due to the localized nature of competition. The latter explains the anti-competitive effect of the merger, and underlines the importance from a competition policy point of view of the definition of the relevant market for merger analysis. Indeed, with localized competition, the ability to exercise market power is concentrated among nearby firms (the post-merger price increases after a merger between close substitutes). In this case, the antitrust market is necessarily highly concentrated, so focusing on market concentration may be irrelevant in markets with localized competition - instead, the 'closeness' of competition and 'submarkets' can prove more appropriate for the antitrust analysis.

Accordingly, "When products in a relevant market are differentiated or sellers are spatially dispersed, individual sellers usually compete more directly with some rivals than with others" (Revised Merger Guidelines §49, 1984, US Department of Justice). More precisely, depending on the current focus of the merger assessment, i.e. either unilateral or co-ordinated effects, either a localized competition criterion or a market shares-based measure appears more reliable[25].

[24] Norman and Pepall (1998) provide in response a necessary condition for a horizontal merger to be internally profitable: sufficient marginal delivery cost heterogeneity between insiders. This is actually the 'spatial' translation of the merger paradox solution suggested by Perry and Porter (1985) in a nonspatial framework, i.e. cost asymmetry between merger partners.

[25] According to the UK Office of Fair Trading report "Merger appraisal in oligopolistic markets" (November 1999), in markets with differentiated products, market shares may be unreliable for the possible extent of any unilateral effects. (Unilateral effects arise when two closely competing products are brought under common ownership. Unilateral effects relate to the merged firm's incentives to raise price even if the merger has no effect on the behaviour of competing firms.) In such cases, it is often more informative to directly assess the proportion of each of the merging firms'

The idea that with spatial settings a particular market definition might be more appropriate is really more general than the Levy and Reitzes (1992) localized competition model implied. McAfee et al. (1992) suggested the same, but in a Cournot shipping model where firms price discriminate. In such a model, at every local market a firm competes against all others, so the intensity of rivalry is symmetric and not localized. Instead of the two-step market assessment procedure of the US Merger Guidelines[26], McAfee et al. (1992) proposes a one-step evaluation based on the estimate of increase in the equilibrium post-merger delivered prices[27]. This suggests a different notion for the relevant antitrust geographic market: unlike the Merger Guidelines, a larger area with this definition causes higher concern, showing that a larger number of consumers will be adversely affected by the merger.

Besides an appropriate market definition, the competition authority could (and should?) consider also alternative mergers in order to achieve a proper evaluation of the merger's negative effect. In the circular model of Levy and Reitzes (1992), modified to allow for production cost reductions through asset ownership *à la* Perry and Porter (1985), Brito (2005) shows by means of a revealed preference argument that the price comparison between a profitable merger between neighboring firms and the most profitable alternative merger between non-neighboring firms, establishes an upper bound on the amount of cost savings that can be obtained through the concentration. Checking this threshold against the minimum efficiency gains necessary for a merger to avoid a price increase allows a better assessment of the merger's likely (anti)competitive effect.

The expected competitive change following the merger is equally related to the possibility of

customers who would have switched to the other merging firm's products following a price rise.

In markets in which products are undifferentiated, market shares are much more inforlative on the possible post-merger price increases. In homogeneous product markets, the most important concern may not be that the merged firm will engage in unilateral price rises, but that the entire market will become tacitly or explicitly collusive after the merger. Post-merger effects that rely on the behaviour of the merged firm's rivals are termed co-ordinated effects.

[26] The relevant market is first defined by means of the 'hypothetical monopolist' paradigm, then market concentration is assessed by the Herfindahl-Hirschman Index. If firms can price discriminate, the 1992 US Merger Guidelines state that "...the Agency will consider additional geographic markets consisting of particular locations of buyers in which a hypothetical monopolist could profitably and separately impose at least a 'small but significant and nontransitory' increase in price."

[27] Incidentally, this reminds that the Hirschman-Herfindahl Index is not an equilibrium criterion for assessing market concentration, because insiders reallocate output between them after merger so as to minimize total delivery cost and eliminate overlapping sales territories.

product/store relocation and/or market entry. Fixed-location spatial models are of course somewhat restrictive in this respect, yet they do provide some basic intuitions.

In their Bertrand competition framework, Reitzes and Levy (1995) point out that the lack of free-rider benefits from merger removes the post-merger incentives for outsiders to relocate or for potential entrants to enter the market. And since it is the spatial price discrimination that restrains the free-riding in their model, it follows that price discrimination can facilitate entry deterrence in spatial markets. Entry is also examined by Deck (2001), in a Hotelling-type mill pricing shopping model with fixed costs allowing for both firm and outlet operation choice. The main purpose of the paper is to stress that a spatial framework may better seize the consumer adverse effects of a merger. Following a bilateral merger within a triopoly, firms decide to operate or not all outlets before competing in prices. Any merger is profitable, thanks to fixed cost reductions, but for a non-contiguous merger between distant firms, it is even more profitable to shut down one of the outlets. This actually hurts consumers in two ways: higher prices and increased travel cost. Indeed, in a spatial framework with outlet location standing for product brand, a merger also modifies welfare through the number of outlets operating afterwards, because this determines the total transport cost/disutility incurred by consumers. A possible antitrust response to such an anti-competitive merger is to require that both affiliates be kept open after the merger. The same result in terms of outlet-operating strategy obtains for a merger between neighbors, yet the above antitrust remedy is ineffective in this case, since prices will still be higher than before merger. Deck (2001) also checks that the threat of entry gives the same incentives as the antitrust remedy in the case of a non-contiguous merger, which basically conforms with the (non-spatial) idea that entry and merger remedies are substitutable[28].

The same is claimed by Cabral (2003), but with a different antitrust moral, in a Salop-type standard shopping model where the possibility of entry is considered both before and after a merger to monopoly. Depending on the comparison between the reservation price and the sunk fixed cost per location, the market is deemed either small or large. In the former case, entry is unprofitable both before and after merger, so consumers only buy from two diametrically-opposite stores, and the post-merger prices go up. In larger markets, however, the merger can trigger entry by a

[28] The 1992 US Merger Guidelines §3 state that "in markets where entry is ...easy,...the merger raises no antitrust concern and ordinarily requires no further analysis".

third firm, which locates its store half-way between the insiders, and thus makes both prices and consumer transport costs fall. The paper argues that in this case insiders may anticipate post-merger entry and strategically react by proposing to divest one outlet in order to have their merger more easily accepted. By doing so, they succeed in 'buying off' the third firm, which would not open another store besides the one already acquired as a means for entering the market. This ultimately restores the symmetric one-store duopoly, which from the consumers' point of view is worse than an asymmetric three-store duopoly that might have obtained otherwise. The main point is that voluntary asset sale chosen and designed by insiders can actually block entry, as compared with a divestiture injunction optimally designed by the competition authority, on account of the insiders' incentive to strategically anticipate both rivals' action and merger control procedures.

This conclusion can only strengthen our point developed in the next section, dealing with the location incentives conveyed by mergers. After all, it is increasingly acknowledged that the merger antitrust assessment ought to deal with the expected post-merger situation by taking into account store/firm relocation and/or brand repositioning for the assessment of merger effects on industry performance and consumers' welfare.

4. Impact of merger and merger-related strategies on location

If fixed-location spatial merger analysis yielded conclusions on the impact of locations on merger incentives and merger-related strategies (such as outsider free-riding or entry pre-emption), the converse is equally worth investigating: the impact of exogenous mergers on endogenous locations.

Allowing for location choice when dealing with mergers in spatial settings represents an equilibrium approach, to the extent that it allows the assessment of strategies of either post-merger relocation or pre-merger location choice with foresight of merger. Both are empirically relevant, the former in the sense of product range repositioning or geographical reshaping of a distribution network, the latter whenever location represents an investment decision, because this is often made before engaging in take-overs[29]. Furthermore, from a spatial point of view, endogenizing location choice provides insight for the relation between market concentration and spatial agglomeration or

[29] Outside the spatial context, the potential of mergers to alter investment choices is recognized - Gatsios and Karp (1992) consider a duopoly and show that the levels of investment chosen with anticipation of merger are different from those chosen without.

dispersion, either in terms of product diversity or in the geographical sense.

The literature on this topic is not vast, and it mainly builds on one of two alternative analytical settings. More often than not, spatial price competition is assumed when dealing with pre-merger optimal location choice, whereas optimal post-merger relocation is studied in a spatial Cournot framework. A short reminder explains these two different strands. Internal profitability is hardly questioned under price competition, thanks to strategic complementarity, so location choices in anticipation of merger aim to further increase merger profitability by reducing the outsiders' free-riding. In contrast, post-merger relocation generating sufficient cost differentials appears as a necessary condition for Cournot competitors to enable merger profitability in the first place.

4.1. Location choice in anticipation of merger

The idea that location choice before merger may increase merger profitability by reducing free-riding was tackled by Rothschild et al. (2000) and Heywood et al. (2001) for Bertrand spatial competitors within a triopoly and then in the general case respectively. Rothschild et al. (2000) obtain that depending on the sharing rule for the post-merger profit, insiders can gain more than the outsider by moving farther away from the latter. The paper reminds however that in order to be profitable, a merger must involve adjacent firms, therefore in this triopoly framework the outsider necessarily holds the 'border' position. The n-firm oligopoly considered by Heywood et al. (2001) allows in contrast for 'interior' mergers, i.e. facing outsiders on both sides, which may not all equally benefit from the merger externality. Outsiders may experience a fall in their profits only after a 'corner' merger, whereas they always benefit from an 'interior' one.

The first paper to have explicitly allowed for pre-merger location choice in anticipation of merger within a spatial price discrimination model is Gupta et al. (1997), who considered a duopoly on Hotelling's unit market. Without foresight of merger, firms locate at the quartiles, which no longer holds when a firm anticipates taking over its rival: as the probability that a particular firm will be the acquiring one increases, it locates ever closer to the center of the market, whereas its target may move towards the market border for high enough probabilities (the symmetry is preserved if firms anticipate the take-over with equal probability). The same incentive to optimally react beforehand in anticipation of the changes brought by the merger is exploited by Ecer (2005). In his Hotelling-type shopping model, when anticipating a stricter merger control, duopolists increase

product differentiation not through location choices, but by the choice of transport cost per distance. This eventually allows firms to sustain higher equilibrium prices, and therefore decreases consumer surplus both directly and indirectly.

A second important point concerning models dealing with location chosen in anticipation of merger is that the spatial pattern thus obtained is actually not efficient, i.e. total transport cost is not minimized. In contrast, when the location decision follows the merger, the insiders always locate so as to minimize transport cost, because this strategy maximizes joint profit[30].

4.2. Post-merger repositioning

Choosing locations after merger necessarily improves locational efficiency, and thereby possibly the merger profitability. To explore the incentive for repositioning/relocation and its consequences in terms of merger assessment, we first review below the spatial literature dealing with the assumption of multi-store/-product competition. This is so because a merger gives rise *a priori* to a multi-unit entity, operating from several locations or offering several jointly-owned brands.

4.2.1. Further insights from location theory: multi-store/product competition

The now vast literature on spatial competition with location choice mainly assumes that each firm can set up only one store, which is presumably done to avoid supplementary analytical complexity. Yet, the theory of spatial competition gains in relevance whenever addressing multi-store/product competition, since it is common practice for firms in the real world to open several retail shops in a given neighborhood[31]. Similarly, in terms of differentiated products, by selling several products in the same market, firms can tailor them to different horizontal segments of the market, and accordingly charge higher prices. Furthermore, this technical simplification is often made at the cost of implying that results extend over from the single-store case, which is not necessarily true. Except for divisionalization (i.e. setting up independent divisions) which rules out centralized decision-making, when a firm has several stores (or, equivalently, product brands), each store's behavior affects the decisions of all other stores on the market, including those owned by the

[30] This second point incidentally reminds that mergers in spatial markets may exhibit other adverse consumer and welfare effects than just price increases.

[31] Retail companies such as fast-food restaurants, supermarkets, gasoline stations, clothing shops, department stores, hotels, travel agencies or bookstores generally operate a chain of outlets.

same firm. Therefore each store cannot be simply viewed as an independent single-store entity, and results obtained with multi-store/product firms are likely to differ from those obtained without[32].

Despite compelling every day observations, the literature dealing with strategic location choice in the multi-store/product framework is not vast, possibly on account of the earliest theoretical results obtained. In Hotelling's model with linear transport cost, Teitz (1968) pointed out that a Nash location equilibrium is not consistent with multi-store competition. The non-existence problem is as usual related to the linearity of transport cost combined with mill f.o.b. pricing, but even with quadratic transport cost, a similarly puzzling finding is obtained by Martinez-Giralt and Neven (1988), who study in this setting the two-stage location-price game between two-store duopolists, both on the linear and the circular markets. They find that in equilibrium both firms cluster own affiliates at a unique location. The incentive to segment the market and enhance consumer surplus extraction by differentiating own products actually intensifies price competition, so in equilibrium firms do not proliferate. Janssen et al. (2003) revisit the mill-pricing location-price duopoly game on the circular city, with general consumer distribution and transport cost functions. By adding a second product differentiation dimension under the form of heterogenous consumer preferences across chains of stores, they show that a pure-strategy equilibrium with distinct outlets does exist. Their result is however striking, to the extent that the location decisions of multi-store firms are entirely independent of each other (they are dominant strategies), and are basically function of consumer distribution only. Stores (rival or not) never agglomerate, and their number has no influence on the pricing decision[33]. To sum up, under standard Bertrand mill pricing competition, both on the linear and circular markets, each firm clusters own stores and rival outlets never agglomerate, so as to relax competition.

On the contrary, the Cournot spatial competition allows the spatial dispersion of a firm's affiliates. In a shipping homogenous-product model, when a firm opens several facilities, they necessarily operate from distinct locations due to the intra-firm strategic substitutability effect, and total profit

[32] In the context of retailing, Ghosh and McLafferty (1987, Chapter 6) argue that the traditional methods of site selection with single-outlet firms are inadequate to analyze location decisions of multi-outlet retail firms. They claim that the analysis of multi-outlet retailers requires systematic evaluation of the impact of each store on the entire network.

[33] This may seem counterintuitive, but is explained by the fact that in a mill pricing model, competition is localized: not all outlets compete with each other, but actually only with neighboring outlets of the competing chain.

is maximized by serving each local market only from that outlet which has the lowest unit delivered cost at that market. However, rival outlet agglomeration is possible in such a framework.

Sarkar et al. (1997) obtained, in the case of spatially separated markets in a discontinuous space (a network), possible partial agglomeration of rival outlets at discrete points, which are always some vertices of the network and never intermediary locations. For the continuous space case (contiguous markets), the location equilibrium for an arbitrary number of firms and stores was thoroughly worked out for the unit segment market by Pal and Sarkar (2002). Their model shows that the problem is less complex than expected, since it can be approximated by a lot simpler one, in which a firm behaves as a monopolist when locating its stores. A firm's equilibrium locations converge to the monopoly pattern as demand grows larger, and when firms have the same number of stores, rival outlets cluster at finitely many discrete points which coincide with a firm's monopoly locations. The location equilibrium is always unique and symmetric with respect to the market center. Both are due to the border effect on the segment market, which imposes for each individual store a unique quantity-median location, depending on the other stores' respective locations and the exogenous market borders.

Given that the quantity-median is double for each store, the circular city framework greatly complicates the location choice for Cournot multi-store firms[34]. It does not come as a surprise that only simple particular cases have been worked out, and the general framework with an arbitrary number of firms and stores appears yet intractable. Chamorro-Rivas (2000) studied the two-plant duopoly, and found that all stores are evenly spaced on the circumference, with affiliates diametrically paired and rival outlets interlacing. Since product homogeneity implies maximum dispersion for a firm's stores, by the same token inter-firm substitutability induces rival stores' dispersion. Still, the equilibrium may not be unique on the circle market, and Cosnita (2005) made the point that the equal number of stores for the two competitors plays an important role. Indeed, competition between one single-store firm and one two-store firm yields two equilibrium patterns: either the single-plant firm clusters with one of the affiliate diametrically opposite to the other affiliate, or the former locates mid-distance between the two rival outlets. Similarly, the equilibrium for one two-store firm facing two single-store firms involves two diametrical pairs: either equidistantly in

[34] On the circle, if a given location satisfies the quantity-median property for a store, so does its diametrically opposite location.

complete dispersion, or collapsing at the opposite ends of the same diameter.

At any rate, the location patterns obtained under spatial quantity competition are clearly consistent not only with commonly observed firm/store clustering, but also with the basic intuitions that a store's location should take into account the location of rival firms/stores. From a more general standpoint, spatial models in their multi-plant or multi-product versions exhibit at least the convenient advantage of modelling post-merger competition in a more realistic way, given that any merger leads to a multi-store/product entity. The spatial framework can therefore be used to consistently answer questions such as: between which brands a merger is most likely to occur, which are the likely changes in terms of product choice/design following the merger, which, if any of the affiliate stores/products is likely to be shut down afterwards, or where a plant might be relocated after the merger.

4.2.2. Merger analysis and antitrust issues with post-merger repositioning

As already mentioned, choosing locations after merger improves locational efficiency. Gandhi et al. (2005) study mergers between firms competing in a Hotelling-type framework that simultaneously choose prices and locations. They find that the merged firm moves its two products away from each other to reduce cannibalization, whereas outsiders move theirs in between the insiders' brands. Gandhi et al. (2005) conclude that post-merger repositioning increases product variety[35]. This benefits consumers, since by decreasing substitutability between merging varieties the post-merger price increase is mitigated. Still, price competition may actually be softened throughout the market, since all varieties are more dispersed.

The outcomes of post-merger relocation such as improved locational efficiency and lower product substitutability (increased variety) or, equivalently, increased spatial dispersion, are equally obtained in the case of Cournot shipping model. The important difference w.r.t. the spatial Bertrand mergers is that relocation can solve the profitability paradox of Cournot mergers, for which the issue of merger rationale was more challenging.

With fixed locations, Norman and Pepall (1998) proved that the merger paradox still holds at each separate local market, and that a sufficient cost heterogeneity between partners is a neces-

[35] See Berry and Waldfogel (2001) for an econometric analysis supporting the outcome of increased product variety due to merger on the linear market.

sary condition to achieve internal profitability. Endogenizing post-merger location choice took the analysis one step further, since supplementary cost savings can arise in this case. The non-spatial studies have put down the sources of the paradox to the combination of strategic substitutability and the inability of insiders to credibly commit to exploiting the potential bigger size of their association, and have suggested various possible solutions. Besides the strategic complementarity, efficiency gains from cost savings or a credible commitment not to decrease output after merger have been thus suggested as solutions for the paradox[36]. Both points have been exploited in the standard shipping Cournot linear model retained by Norman and Pepall (2000), who argue that location can be a key factor allowing the merger to lead to a bigger and better firm: competitors have different location advantages in serving the set of spatially separated markets, hence a bilateral merger does not shut down one of the outlets, but instead can coordinate their location decisions, so as to become a bigger entity, better adjusted to consumer locations. The pre-merger market equilibrium has all firms clustered at the market center, as shown by Anderson and Neven (1991). After merger, the two insiders are assumed to act as Stackelberg leaders in location choices: whereas rivals still optimally cluster at the segment mid-point, affiliates migrate symmetrically towards the market borders due to intra-firm strategic substitutability, thus minimizing total transport cost and acquiring a comparative locational advantage over rivals w.r.t. the distant demand located at the segment ends. The market shares gained over this 'captive' demand offset the loss of market shares over central locations, and the merger is shown to be profitable provided that the initial market is not too concentrated.

It would appear therefore that the behavioral asymmetry gives rise to enough cost savings through relocation to allow mergers to become profitable. The result is questioned though by Cosnita (2005), and shown instead to crucially depend on the linear space assumption and the ensuing border effects.

Norman and Pepall (2000) acknowledge that the post-merger equilibrium with insiders acting as a Stackelberg leader in location choice is strictly equivalent to the simultaneous location game where the merged entity makes a centralized location decision for its two outlets. This approach is applied by Cosnita (2005) with unchanged assumptions save one, the linear space. As a result, bilateral

[36] Daughety (1990) changed the insiders' behaviour to Stackelberg leadership to show that commitment is essential for merger profitability.

Cournot mergers in the circular city are shown to be unprofitable if the initial market contains at least four competitors. In contrast to the linear model, the analysis is complicated by the fact that the post-merger spatial equilibrium is not unique. To put it short, even though relocation does yield delivery cost savings for the merged entity, the symmetry of the circular framework no longer affords the opportunity of capturing some captive demand, so the insiders can no longer put to profit this locational advantage[37]. This is actually consistent with a corollary of Deneckere and Davidson (1985), according to which in markets with symmetric intensity of competition the incentives to profitably merge are considerably lower.

Besides the improved location efficiency, the bilateral Cournot mergers on the linear city studied by Norman and Pepall (2000) necessarily increase market concentration and reduce competitive pressure at each local market, with the result that prices rise for most consumers (actually, the only consumes for which prices fall are those located towards the market borders, closest to the two affiliates, but overall consumer surplus falls)[38].

To prevent and contain such competition-adverse effects, merger control authorities may resort to remedies - typically, in the case of horizontal mergers, under the form of divestiture injunctions (mandatory asset sales) - meant to restore market competition and prevent a price raise. Cosnita (2006) proposes an equilibrium analysis[39] w.r.t. spatial mergers, divestitures and their respective competitive effects. The primary purpose of this paper is the comparison between the incentives for merger and divisionalization in a linear shipping Cournot setting. Basic insight from the non-spatial analyses was that spinning off is profitable when merging is not[40], so they are viewed as mutually exclusive business strategies. Cosnita (2006) argues instead that although merger is profitable, subsequent divisionalization can be even more, provided it only involves partial spin-off (i.e. establishing multi-store affiliates). In the linear framework retained, this sequence of strategies

[37] The merger to duopoly is still profitable, because the two insiders face competition on one side only: some captive demand is still available at locations between their respective positions. In turn, the merger to triopoly is no longer profitable, since the merged entity competes against two outsiders, and both resulting location equilibria have each affiliate face competitors on both sides.

[38] Yet, and in contrast to nonspatial analyses, the increased profit for both insiders and outsiders, together with the improved locational efficiency, are almost always sufficient to offset the consumer surplus-reducing effect and increase overall welfare.

[39] I.e. based on location equilibria both before and after merger and/or divestiture.

[40] See Polasky (1992) and Baye et al. (1996) for explicit analyses of divisionalization incentives.

makes the best of both: the merger yields transport cost efficiency gains and a locational advantage, whereas by divisionalization the merged entity credibly commits to maintaining a high output[41]. The merger control insight in terms of divestiture effects is provided by a possible interpretation of the spatial outcome obtained after merger and divisionalization. Cosnita (2006) shows that the ultimate location pattern coincides with that following a mandatory asset sale to a new entrant. Such a measure is rendered necessary by the merger's adverse price effect, and is effective, inasmuch as the overall consumer surplus increases after divestiture. In this model, the advantage of the spatial setting is finally threefold: to provide a consistent framework for an equilibrium analysis of both merger and divisionalization, to identify the markets where the adverse price effects occur through the equilibrium spatial analysis, and finally, to illustrate a situation where albeit being effective, a post-merger divestiture can increase merger profitability.

5. Concluding remarks

The purpose of this review of the literature dealing with horizontal mergers in a spatial framework was to stress that location, and space in general, are important for better grasping both the motivations for and the outcome of market concentration. The paper aims to highlight the two-way relationship between horizontal market concentration behavior and location choices, to the extent that different exogenous spatial patterns may give rise to different incentives to merge or merger-related strategies, but also, mergers and acquisitions give rise to relocation and product-space repositioning strategies in addition to their price and welfare effects. It takes an appropriate spatial framework to further explore the incentives for and the outcome of mergers, and this is the main point that this paper attempts to make.

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[41] This overall profitability comparison still holds even if the initial merger is not profitable, which incidentally suggest a possible rationale for apparently unprofitable mergers: merge so as to better divisionalize afterwards and thereby increase profits.

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