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Do Vertical Contracts Lead to Foreclosure or to Efficiency Gains? An Empirical Study of the Food and Beverage Industry

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Abstract

This paper presents a research method to determine whether vertical contracts concluded between firms operating at different levels of the supply chain are efficient from the perspective of the most recent industrial organisation theory. In this view, some case studies are presented concerning antitrust investigations against some large companies operating in the food and beverage sector in Italy. Despite the controversy surrounding the effects of vertical agreements, as they may be pro- or anti-competitive, the paper shows that not only market concentration but also intra-sectoral asymmetries are crucial factors to be assessed in order to distinguish between foreclosing and efficiency-enhancing agreements.

Keywords: Vertical restraint, market dominance, heterogeneous productivity

Introduction

The abuse of dominant position is associated with abusive conducts and anti-competitive actions made by a firm with the specific intent to acquire, preserve or enhance monopoly power. This concept started to draw the attention of the European Commission with the creation of the European Market in order to promote a fair competition in the internal market. This principle is contained in the Article 82 of the Treaty of the European Union in the judgment for the lawfulness of vertical and horizontal agreements.

Any agreements able to prevent, restrict or distort the competition are prohibited, unless they improve the production or distribution of goods, promoting technical or economic progress allowing consumers a fair share of the resulting benefit.

Vertical restraints are contracts concluded between firms operating at different levels of the supply chain with the aim of imposing specific conditions on the supply or behaviour of retailers, eliminating the double mark-up, better coordinating activities in order to reduce transaction costs and increasing the efficiency of the vertical chain. However, the restrictive nature of these agreements may reduce retailers' choice in terms of quality and quantity of supply, foreclose competitors and increase the risk of abuse of a dominant position. Indeed, the prohibition of agreements stems from EC regulations to avoid distortions of competition in the EU, with an exemption clause if the market share of the supplier/buyer does not exceed 30% of the relevant market (EC Regulation 2790/99).

The current trend in US jurisprudence shows the dominant pro-competitive rationale of exclusive contracts (Fumagalli et al., 2012): the increased monopoly power gained by firms that enter into exclusive clauses is less likely to be found to violate the Sherman Act. American experts argue that US law needs a new standard for monopolies that focuses less on consumer harm and more on the distorted incentives created by firms. The trend is different in Europe, where exclusive contracts signed by dominant firms are treated as illegal and therefore prohibited. Most famously, the European Commission imposed a record fine of €4.34 billion for Google's antitrust violations in 2018. The antitrust authority fined Google for imposing illegal restrictions on Android device manufacturers and mobile network operators, in order to consolidate its dominant position in general internet search[1]. In particular, the fine relates to Google's requirement that manufacturers pre-install Google's search and browser (Chrome) applications as a condition for licensing Google's Apple Store. The European Commission has fined the largest US companies for similar abusive practices and illegal tying: Intel, Microsoft and Facebook. The US approach to the creation of monopolies is softer and mainly aimed at preventing the acquisition of rivals by similar firms. Currently, the main objectives of the competition policy are in the direction of the efficiency-enhancing effects and of the European market integration, principally the maintenance of the competitive markets, to the aim of being competitive worldwide. This approach differs from the traditional purpose of the antitrust regulation in terms of consumers‘ surplus and is mainly concerned with the identification

[1] European Commission - IP/18/4581 - Press release, 18 July 2018, Brussels. Retrieved at: https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581.

of pro and anti-competitive effects of restraints. In EU antitrust cases, the 30% market share rule has not been applied consistently. In some cases, firms with market shares below 30% have been fined for restrictive agreements; in other cases, firms with market shares above 30% have been found not to have foreclosed the market. In such a situation, the position of vertical agreements is unclear, as they may be pro-competitive or anti-competitive, depending on the circumstances.

This paper aims to provide guidance on how to distinguish between efficient and non-efficient vertical contracts from the perspective of the most recent industrial organisation theory. As a further objective, some case studies will be presented related to antitrust investigations against some large companies operating in the food and beverage sector in Italy. Despite the controversy surrounding the effects of vertical agreements, the paper will show that not only market concentration but also intra-sectoral asymmetries are crucial factors to be assessed in order to distinguish between foreclosing and efficiency-enhancing agreements.

The industrial organisation literature has extensively studied the economics of vertical restraints, highlighting two opposing perspectives. On the one hand, exclusive contracts may prevent efficient entry. Many authors have contributed to a strand of the literature on the foreclosure effects of vertical restraints, such as Aghion and Bolton (1987), Rasmusen et al., (1991), Berhneim and Whinston (1998), Fumagalli et al., (2012). Aghion and Bolton (1987) explain that when a buyer and seller sign an exclusive contract, they have monopoly power over the entrant. They can jointly determine the fee that the entrant must pay in order to trade with the buyer. Therefore, the main reason for signing exclusive contracts is to extract some of the surplus an entrant would receive by entering the seller's market. In Rasmusen et al., (1991) the authors confirm that anti-competitive foreclosure is a potentially serious problem as it occurs in more than two thirds of all cases. Similarly, several works argue that strategies to raise rivals' costs implemented through vertical restraints can be used against actual competitors in order to force them out of the market or at least significantly reduce their market share, as well as against potential competitors in order to prevent or at least delay their entry into the market[2]. On the other hand, another strand of the literature emphasises that exclusive contracts can, under certain circumstances, serve as efficiency-enhancing tools by protecting the relationship-specific investment of the exclusive rights holder against opportunistic violations (Segal and Whinston, 2000; Groh and Spagnolo, 2004; De Meza and Selvaggi, 2007). As such, exclusive contracts serve as a tool to protect the investment made by the manufacturer to increase the sales

[2] For an extensive discussion on this, see Ray and Vergé (2008).

of the retailer or to reduce his distribution costs, irrespective of the brands carried by the retailer (Besanko and Perry, 1993). Exclusive agreements have the effect of protecting such investments. They keep them specific to the brand in which the supplier invests.

However, the existing literature cannot provide a theoretical underpinning for this evidence on antitrust decisions because the two potential effects, foreclosure and efficiency gains, are analysed in isolation. The common assumption is that competition between two producers is symmetric. However, antitrust authorities are rarely concerned with competitors of equal size competing vigorously; more often the risk of abusive conduct arises when a dominant firm competes with smaller rivals. Addressing the limitations of the previous literature, there is a third more recent theoretical approach, which shows that exclusive contracts can have both pro-competitive and anti-competitive effects, depending on the competitive advantage of the dominant firm over its rivals (Calzolari and Denicolò, 2015). This approach is extensively described in next section.

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A general theory of market dominance

The competitive environment is characterised by the presence of a dominant firm, which controls a significant share of the market, and a smaller competitor or group of smaller competitors, which are often unable to respond to the dominant firm's exclusionary strategies. Strictly following Calzolari and Denicolò (2015), the effects of vertical restraints are assessed in two different environments, characterised by the coexistence of a dominant firm interacting with a competitive fringe in next sub-section and with another firm in a duopoly market in the following section. In both cases, both pro-competitive and anti-competitive forces drive the firms' strategies towards equilibrium. Their relative importance is strongly influenced by the degree of competitive advantage between the dominant firm and its rivals, as discussed below. If the competitive advantage is large enough, the dominant firm can use exclusive contracts for anti-competitive purposes. This means that there is a threshold of advantage above which competitors are unable to respond to the dominant firm's strategies in a way that more than outweighs the pro-competitive effect.

A dominant firm competing against several small firms with low market shares

I will first analyse the case where the dominant firm supplies product A and competes with a large number of smaller firms with very little market power, supplying product B, which we will call the competitive fringe. A and B are imperfect substitutes. The low market power implies that the competitive fringe cannot impose exclusivity clauses. The game implies that while the competitive fringe always prices at marginal cost, so that $p_B(q_B) = c$, the dominant firm responds by offering a menu of contracts, either non-linear pricing or exclusivity, depending on the quantity purchased. The analysis introduces some asymmetry between the dominant firm and the competitive fringe, measured by the cost difference c (since the dominant firm's marginal cost is zero and the competitive fringe's marginal cost is c): a large competitive advantage corresponds to a large marginal cost difference. The low marginal cost allows the firm to set a lower price and to better challenge rivals in situations where exclusive contracts increase price competition.

If the competitive advantage enjoyed by the dominant firm is relatively large, buyers with low demand will be effectively locked in, allowing the dominant firm to engage in monopoly pricing. As demand increases, the buyer is tempted to buy both products A and B. Since the products are substitutes, as demand for B increases, demand for A decreases. To prevent this, the dominant firm adopts a limit pricing strategy, thereby increasing sales of A and making it impossible for rival B to compete. If demand increases further, it becomes unprofitable to exclude competitors. In this situation the buyer buys both product A and B.

Exclusive dealing is also evaluated. It is an agreement with which the buyer agrees with the seller not to handle goods of competing producers. If exclusive dealing is allowed, the dominant firm will use such a clause to limit the pressure of the competitive fringe in the second-best strategy, when firm A has to lower its price to capture the entire demand. In this case, competition shifts from each marginal unit to competition for the entire quantity demanded. Firm A can use its competitive advantage and sell the monopoly quantity to buyers with higher demand without having to price low or at the limit. Exclusive dealing allows the dominant firm to more profitably exclude rivals from a segment of the market. This is only possible because the competitive advantage allows the dominant firm to offer a price schedule that is favourable to the buyer. Since foreclosure is inefficient in the high demand segment, exclusive dealing cannot prevail in such a market segment. Conversely, exclusive dealing may be optimal in low demand states, where the dominant firm can exploit its market power more profitably. Market power is the power to offer the buyer a price schedule, both exclusive and non-exclusive, that induces the buyer to accept the exclusive contract.

Exclusive dealing reduces output and raises prices. Competitors are foreclosed from a segment of the market and buyers are harmed because they have to pay a higher price. This means that when the competitive advantage is large, the market equilibrium implies partial foreclosure. It is partial because the competitive fringe is not completely driven out of the market, but the imposition of monopoly prices is only profitable at low levels of demand. On the price side, exclusive contracts lead to an increase in the price level. On the product variety side, as the buyer accepts exclusive contracts, the quantity supplied by competing firms decreases or is still zero; thus, product variety decreases. On the welfare side, the buyer is harmed by the increased price in the low and medium demand states, while in the high segment the prices are the same as in non-linear pricing. Exclusive dealing is therefore detrimental to social welfare because it leads to an increase in the price at which the buyer accepts the contract, a reduction in product variety and the exclusion of competitors from the market for certain demand levels. In addition, the market share of the dominant firm increases. Thus, in a market where the dominant firm has significant market power relative to its competitors, the use of exclusive contracts is sub-optimal for buyers, who pay more to buy less, and sub-optimal for rivals, who are partially foreclosed from the market.

If the competitive advantage is small, the dominant firm will not be able to set monopoly prices at low levels of demand. Moreover, under non-linear pricing, the monopoly region disappears completely and buyers are served under limit pricing. Similarly, the monopoly solution cannot be implemented with exclusive contracts because the lower market power does not allow the firm to offer a price schedule that is convenient for the buyer compared to the one offered by the competitive fringe. Competitive pressure thus forces the dominant firm to set the exclusive price at cost. This means that with non-linear pricing, the buyer in low demand states will only buy product B because of the lower price, while product A will only be bought by buyers in high demand states. With exclusive contracts, the situation changes completely. The dominant firm tries to undercut the competitive fringe in the low demand segment with the protection of the exclusivity clause and by offering a lower price. The level of purchases in high demand states remains unchanged, as buyers prefer to buy both A and B.

The use of exclusive contracts drastically changes the market equilibrium. Exclusivity allows the dominant firm to foreclose rivals in the low demand segment, while retaining the possibility to jointly serve the market in the high demand segment. The effects on rivals are much worse, as they are completely foreclosed in some market segments and partially foreclosed in others. It can be said that when the dominant firm has a better competitive position than smaller rivals with less market power, the effects of exclusive contracts are mostly negative or anti-competitive, since in both cases competitors are foreclosed from parts of the market.

At this point it is easy to draw an important conclusion: there is a critical value of the competitive advantage c^* such that exclusive contracts reduce social welfare when $c > c^*$ and increase social welfare when when

$c < c^*$. In other words, the degree of asymmetry makes exclusive contracts anti-competitive or pro-competitive.

Asymmetric duopoly

In the duopoly model, the dominant firm is in competition with a rival firm that enjoys a certain degree of market power. The main implication is that, in this case, firm B can actively respond to the exclusionary strategies of the dominant firm by offering exclusive contracts as well or, alternatively, by offering a highly competitive non-exclusive price. Finding equilibrium in this situation is more complex because both firms strategically choose their pricing strategies.

If the competitive advantage of the dominant firm is large, the result is the same as in the competitive fringe model: depending on the demand segment, firm A will engage in monopoly pricing, limit pricing or joint representation in nonlinear price equilibrium. With exclusive contracts, firm B can now counteract firm A's strategy by offering exclusive contracts as well. In this case, firm B will set its exclusive price at cost, but the dominant firm A will be able to lower its price due to its higher market power. The result is that only the contract offered by Firm A will be accepted. At this point, firm B can respond by undercutting its non-exclusive prices: while firm A tries to induce the buyer to accept its exclusive contract, firm B opts for joint representation. In such a situation, the rival firm is harmed by the exclusive contract, first because of the reduced output and second because of the reduced price it has to offer to avoid being foreclosed. The result is that A makes positive profits and B does not. It is possible to say at this point that when the competitive advantage of the dominant firm is large, exclusive contracts tend to be anti-competitive because of the negative effects on firms' profits, prices and social welfare. They are used as a substitute for limit pricing as a more profitable strategy to exclude rivals in a market segment. In this duopolistic situation, exclusive dealing is also harmful for the rival of the dominant firm because its market share falls and it has to lower prices to avoid foreclosure.

Vertical restraints in the food and beverage sector

The European competition policy does not punish the creation of dominant position but only its abuse for anti-competitive purposes and this principle is expressed in the fixing of a threshold beyond which the use of vertical restraint might result in foreclosure and fair trade distortion between EU members. The list of possible abusive conducts is not exhaustive but the EU competition law usually associates a behaviour of a dominant firm with exploitative or exclusionary practices such as predatory pricing, rebates, tying or bundling or exclusive dealing (Etro, 2007). The exclusionary practices are measures that exclude rivals from competing in the same market, so they usually work horizontally. Instead, exploitative practices requires market power but they operate only vertically: it involves the extraction of surplus from a firm at a different stages of the production process. One important point is that the European Law does not punish the creation of a dominant position, just its abuse. This means that only the practices aimed in excluding rivals should be forbidden; while, the ones that are aimed at increasing market power through a better coordination of the vertical structure, involving the exploitation of the power of each agent involved, should be allowed. The European Commission has, for this reason, fixed a threshold beyond which the use of vertical restraints could mean taking abusive conducts: firms with more than 30% of market share are assumed to be in a dominant position so, any exploitative vertical restraint, could easily take the form of exclusionary practice. vertical restraints certainly are useful for the coordination of vertical structure but there are matters in which coordination might result in exclusionary practices: they are anti-competitive if they foreclose rivals to fairly participate at the market transactions. In understanding the exclusionary risks of vertical restraints, we need to take into consideration two aspects: foreclosure and sustainability. The first concerns whether the contractual practice forecloses any portion of the relevant market; the second refers to the degree of foreclosure. Restraint is hence unlawful if it denies rivals a reasonable opportunity to compete for resources that would be necessary for the rivals' efficient operation in the market. Another important thing to take into consideration is that firms usually do not use a single vertical restraint in isolation, but there is more probability to find a combination of restrictions. This may, on one hand, aggravate their negative effects and increase efficiency on the other. For instance, as intra-brand competition decreases, a retailer might be tempted to increase the price. A combination on exclusive dealing with quantity forcing, or with maximum resale price, may limit such increase. The anti-competitive effects might be worsened if the distribution network is organized in a way that several suppliers and their buyers make use of the same vertical agreement. The result, in this case, would be a cumulative effect that worsens the competitive equilibria in the market.

Data refer to investigations by the 'Autorità Garante della Concorrenza e del Mercato' in Italy against companies concluding restrictive vertical agreements under the EU rules on vertical restraints[3]. In assessing the effects of vertical agreements, I consider three different case studies of the food and beverage sector involved in antitrust investigations to

[3] Treaty of Rome, art. 81; European Commission Regulation No 19/65; European Commission Regulation No 2790/99.

understand how seemingly similar cases could lead to different outcomes. Using the theoretical framework developed in Calzolari and Denicolò (2015), the market characteristics explaining these different outcomes could be the following: i) the degree of market power of the firms operating in the market, and ii) their efficiency differences. The case studies consider the following products: industrial ice cream, artificial milk and beer[4]. For all of these products, the vertical restraints have been adopted by the leading firms, but the final decision of the authority has been different.

Methods

The first part of the project was devoted to researching case studies in which some large companies were involved in antitrust investigations of vertical agreements. The selection process was based on an assessment of the degree of market power of the companies active in the market and on efficiency differences between companies active in the same sector. Three case studies were identified in the context of the investigations carried out by the 'Autorità Garante della Concorrenza e del Mercato' on vertical agreements in Italy between 1993 and 2015. The cases concern the food and beverage sector.

At first glance, the case studies on vertical restraints show that the 30% market share threshold was not applied uniformly. In some cases, firms with market shares below 30% were found to have entered into restrictive agreements, while in other cases firms with higher market shares were found not to be at risk. This confirms the idea that other aspects of competition should be taken into account.

The legal assessment of vertical restraints in EU legislation is based solely on market shares, whereas merger decisions are based on concentration considerations. This further justifies the analysis of concentration indices to understand the competitive dynamics in markets. The US and EU Horizontal Merger Guidelines determine the concentration level above which a merger may be challenged by setting different thresholds. A merger between firms with significant market power may lead to a level of concentration at which the merger is likely to “increase prices, reduce output, choice or quality of goods and services, diminish innovation,

[4] Official documents relating to antitrust investigations are available online at the following link: https://www.agcm.it/competenze/tutela-della-concorrenza/delibere/. For more details on the case studies reported in this paper, please refer to Provvedimento n. 4547-I212 and Provvedimento n. 10080 –I487 for ice cream, Provvedimento n. 8087 –I328 for artificial milk; no firms have been fined for restrictive agreements in the beer sector.

or otherwise influence parameters of competition"[5]. In this view, the four-firm concentration ratio (CR4) is calculated for the relevant years according to the antitrust investigations. The choice of the CR4 ratio makes it possible to understand the competitive dynamics in markets where there are some important companies. Even if there is no general consensus on the threshold that proves that the market is concentrated, I assume that a market is concentrated if the CR4 ratio is higher than 80%; otherwise, market power is more dispersed.

The other aspect taken into account is asymmetry at the sectoral level. I measure this comparing the CR4 ratio with another market concentration index, the Herfindahl-Hirschman (HHI) index. The HHI index is calculated by using market shares and ranges from 1 in the case of a monopoly to 0 in the case of perfect symmetry with a large number of firms operating in the market[6].

More specifically, the analysis was carried out in the following steps:

1. the definition of the relevant market used by the competition authority;
2. assessing the firms' market shares;
3. calculation of the CR4 ratio and the HHI index;
4. assessment of market power and asymmetry at sector level;
5. qualitative assessment of the results using a competition diagram to identify possible scenarios in which the anti-competitive and efficiency enhancing effects can be identified.

In the results section, I present three case studies to understand how vertical contracts can lead to different antitrust decisions. They are described in the following analytical order, corresponding to the possible scenarios identified by Calzolari and Denicolò (2015):

a) a dominant firm in the market with several small competitors;
b) symmetric firms in a market with few players;
c) heterogeneous but symmetric firms.

[5] European Commission OJ C 31, 5.2.2004, *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings*.

[6] The main drawback of the analysis is that, since the firms involved are large companies, information on market shares, annual turnover or specific contracts with downstream agents is confidential, and therefore censored in public documents. The number of firms and concentration ratios come from official documents. The market shares used in the computation of HHI are simply given by 1/N, where N is the number of active firms.

Results

The ice cream market

The market for industrial ice cream is characterised by the presence of a few large companies and a large number of very small companies. The relevant market is that for impulse ice cream in the out-of-home (OOH) channel, i.e. the product is consumed at or near the point of purchase. In this case, the relevant market is limited to industrially packaged single-serve ice cream. From a geographical point of view, the relevant market is the national territory of Italy, where there are no differences in consumption habits and product characteristics[7].

All the companies on the market have adopted the same contractual framework, which includes an exclusivity clause and an exclusive territory in contracts with resellers; exclusive supply to points of sale; the indication of the distributor to obtain supplies in contracts with points of sale; the imposition of suggested prices through the provision of posters on which prices are already indicated (points of sale can, however, change the price and the suggested price takes the form of a minimum resale price maintenance); the so-called "freezer exclusivity" clause, which means that the manufacturer provides the outlet with the appropriate equipment, provided that it does not use this equipment for the products of competitors; a penalty for breach of contract amounting to 50% of the annual consumption of ice cream. It is important to note that not all contracts contain all the clauses listed, but only some of them; the choice depends on the annual turnover in sales and quantities, the location, the seasonal activity of the counterpart, and so on. The companies explained that these restrictions help to improve supply, as they allow better forecasting of demand in order to guarantee a constant supply of products throughout the territory, where there are very large and very small points of sale; the result is a reduction in distribution costs through appropriate production planning . The final effect would be positive for consumers, who could enjoy a constant choice of products and lower prices. Companies agree that the removal of restrictions in their contracts could lead to an increase in costs of around 4.5%. The ice cream market is characterised by a high degree of concentration due to the presence of a few large companies (4) and several smaller companies (41) with very low market power. Data on the CR4 ratio and the 1/HHI index are shown in Table 1 for the years 1995, 1996 and 2001.

Table 1. *Concentration indexes, product: industrial ice cream*

Year:	1995	1996	2001
CR 4	89,00%	90,00%	90,00%
HHI	0,284	0,297	0,303

[7] Autorità Garante della Concorrenza e del Mercato, *Provvedimento n. 4547 - I212*, 1996.

The CR4 ratio is very high and stable over time, indicating high market concentration. The 1/HHI index is calculated on the basis of 45 active firms. Since the 1/HHI has a minimum value of 1/N (in this case 0.0204) and a maximum value of 1, the low value obtained suggests that we are far from a monopolistic scenario; in any case, this value increases over the years, suggesting that the distribution of firm size is becoming more asymmetric.

These companies have been the subject of antitrust proceedings on several occasions, with different final decisions:

- In 1996, the four largest companies were fined for restrictive agreements. Even if only the top producer has a market share above the threshold set by EU law, the cumulative effect of the same contractual structure used by all four firms in the market has been to raise entry barriers.
- In 2003, following a complaint by food and drink retailers denouncing the existence of a restrictive agreement between the main industrial ice cream producers, the Antitrust Authority ruled in favour of the form of contract used by the companies, since, following the previous investigation, the number of exclusive contracts was reduced to 57% of outlets . This means that the 43% of the commercial businesses is free from exclusivity clauses, and such a number was expected to increase[8].
- In 2017, the top producer adopted exclusive contracts for around 70-80% of its customers, leading to fines for abuse of a dominant position.

The legal treatment of vertical agreements is therefore ambiguous, as the 30% market share threshold was not applied in all scenarios, while the cumulative effect is considered to be the most important. All companies had adopted exclusive contracts but, as the top producers had indicated, their choice had to be seen as a defensive strategy against the dominant company in the market. In order to overcome the top producer's increasingly exclusive distribution system, other large companies had to adopt the same distribution strategy in order to protect their sales outlets. The result is a kind of blockade in the distribution network, which prevents other firms from entering the market and competing with the established producers.

The artificial milk market

The second competitive environment concerns the artificial milk market and the distribution system implemented by the main companies on the Italian market. In this case, the competitive dynamics are characterised by a high level of concentration, but the operating companies are similar in terms of market shares. The vertical restrictions adopted by the companies include: exclusive distribution, which aims to maintain pharmacies and baby

[8] Autorità Garante della Concorrenza e del Mercato, Provvedimento n. 11662 – I487, 2003.

shops as the only distribution channels; and the use of suggested prices, which are respected by almost all pharmacies.

The investigation was triggered by a report from mass retailers, which revealed their exclusion from the distribution network, despite their repeated requests to include the artificial milk in their supermarkets. The producers argued that such a restriction was necessary to keep consumption of formula milk low in the first months of a baby's life. Given that Italy has the lowest rate of consumption in Europe and that the use of such products is monitored by paediatricians, who also indicate which type of formula to buy, the supply of such products to supermarkets could lead to an increase in consumption. However, by maintaining the pharmaceutical company as the only distribution network, companies can obtain higher prices due to the low bargaining power of such small shops, which usually set the price proposed by the upstream companies. In this case, no company has been fined for exclusivity concerns[9]. The negative effects of their contracts affect the retail network, which forces their specific products onto its shelves. By maintaining the pharmaceutical channel as the only distribution channel, the companies were able to exclude retailers and keep prices higher due to the specificity of the pharmaceutical channel. Data on the CR4 ratio and the 1/HHI index are shown in Table 2 for the years 1993-1998.

Table 2. *Concentration indexes, product: artificial milk*

Year:	1993	1994	1995	1996	1997	1998
CR 4	80,9%	80,5%	83,7%	84,7%	84,9%	86,5%
HHI	0,180	0,179	0,188	0,193	0,195	0,198

The CR4 ratio shows a high degree of concentration in the market, which has increased over time. The low value of 1/HHI confirms that this market has a good symmetry between the operating companies: in this case, the lowest possible value, 1/N, is given by 0.143 in the case of perfect symmetry between companies. This competitive environment is therefore a good example of vertical contracts adopted by symmetric firms in the market. In a market where the number of active firms is small and they all have some degree of market power, the use of vertical restraints has the same effect as in the case analysed above: in order to protect themselves against the risk of foreclosure, all firms with significant market shares use the same contractual structure to compete for the same market segment. In this particular scenario, where the competitive environment is more symmetric than in the ice-cream market, the effect is collusive behaviour between firms. The adoption of the same type of contract in order to compete in the same market segment is a strategy that only competitive firms can maintain, since this type of contract is based on exclusivity clauses. The presence of only a

[9] Autorità Garante della Concorrenza e del Mercato, Provvedimento n. 8087 – I328, 2000.

few players in the market, all of whom have market power and similar market shares, leads to a situation where all companies adopt the same behaviour. The result in this scenario is collusive behaviour adopted by firms as the only profitable strategy to maintain competition with powerful competitors.

The beer market

The third competitive environment is the beer sector. This market has many companies, both producers and wholesalers, with different characteristics in terms of size, product characteristics, nationality and so on. The antitrust investigation was launched against the leading producer for the use of several restrictions in contracts with both distributors and sales outlets. During the investigation, the authority consulted other producers in order to understand the competitive risks, and the result was that all producers usually use the same vertical restrictions in their contracts. The restrictions used in contracts with wholesalers are: price restrictions, according to a price list used for all transactions ; the definition of some promotional activities to be carried out in order to promote the product subject to the contract; exclusive territory in return for minimum quantities to be purchased. The following clauses are used in contracts with sales outlets: exclusivity for both the purchase and the sale of draught beer; the minimum quantity required to be supplied by the distributor; the designation of the distributor to be used. The Authority also consulted foreign beer producers selling their products in Italy in order to understand their access to the market. It was found that these companies also use the same exclusivity agreements. The use of such restrictions is justified by the improvement of supply conditions, thus ensuring a constant supply to better meet the needs of demand[10]. The beer market is characterised by the presence of several companies of different sizes. The competitive environment is characterised by many companies with some degree of market power. Data on the CR4 ratio and the 1/HHI index are shown in Table 3 for the years 2011-2015. The CR4 ratio shows a lower level than for the previous products, indicating a higher degree of market fragmentation, which seems to be rather constant over time.

Table 3. *Concentration indexes, product: beer*

Year:	2011	2012	2013	2014	2015
CR 4	60,99%	62,52%	61,61%	62,24%	61,16%
HHI	0,136	0,143	0,138	0,138	0,130

The highest and lowest values of the HHI are 1 in the monopoly regime and 0.017 in the case of perfect symmetry between firms, assuming 60 firms in the market. The data in Table 3 show that the market is highly fragmented. The beer market is therefore a good example of a heterogeneous

[10] Autorità Garante della Concorrenza e del Mercato, Provvedimento n. 9794 – I436, 2001.

set of firms entering into vertical contracts, none of which enjoys a dominant position. The fragmentation of the market justifies the fact that the investigation against the leading producer did not result in a fine being imposed on the company (or other companies), even though companies usually adopt vertical restraints. No cumulative effect found.

Developing a competition diagram

The purpose of this section is to find a correlation between CR4 ratio and HHI index to identify which sectors with vertical agreements were characterized by anti-competitive behaviour. All of the data presented in the previous sub-sections have been combined in a competition diagram (Figure 1), which helps us to assess the dynamics of competition in a unified picture.

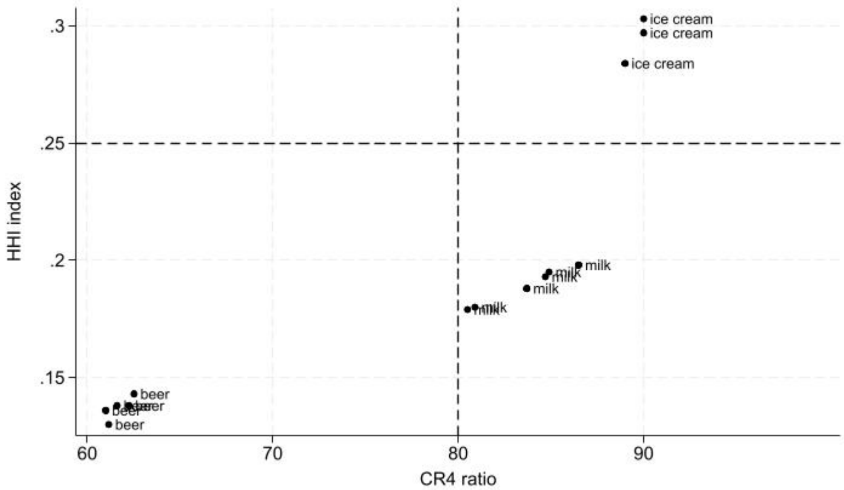

Figure 1. *Scatter plot of concentration indexes, food and beverage sector*

Using the CR4 ratio (80% threshold) and the HHI index (0.25 threshold) in Figure 1, I can identify four regions. Starting from the top left, the regions are counter-clockwise as follows:

- Region 1: Low market concentration. Small difference in the market power of the firms. No firms would be able to enter into vertical agreements. The low concentration and the fragmentation of market power among similar firms mitigate the risk that vertical restraints may be harmful.
- Region 2: Low market concentration and large asymmetry in firms' market power. Only more efficient firms would be able to enter into vertical agreements, and they would not be forced to use them for anti-competitive reasons but only for efficiency reasons.
- Region 3: High market concentration. Similar firms in terms of market power. This region includes sectors with a few large firms with similar characteristics that are able to sustain an aggressive strategy based on exclusive contracts.

- Region 4: High concentration and asymmetric distribution of market power. Presence of a dominant firm that increases its competitive advantage and is the only one able to maintain an exclusive dealing strategy while competitors lose market share.

The diagram depicted in Figure 1 gives some indication of the possible competitive effects of vertical agreements and shows that the only solution without competitive risks is where market power is shared between several companies with low concentration levels. The competitive risk of abusive behaviour is quite low. While there is no risk of dominance in regions 1 and 2, there is a non-negligible risk of collusion in region 3 and a tendency towards monopoly in region 4, with higher prices and higher barriers to entry. Indeed, the graph shows two cases, corresponding to regions 3 and 4, in which anti-competitive concerns may arise. In the first case, there are only few similar firms. The second one refers to a high concentration ratio where a single firm has significant market power. In such a situation, the competitive dynamics could easily lead to collusion and dominance, raising price levels and increasing barriers to entry. Beer distribution is shown in region 1 of the map, artificial milk in region 3 and ice cream production in region 4. In line with theoretical predictions, no antitrust investigations are found in region 2.

Discussion

As the anti-competitive effect has some impact on other firms in the market, it could be important to predict the competitive dynamics and not just to focus on the "weight" of a single firm. The 30% market share threshold does not guarantee against the possible anti-competitive effects highlighted in this paper. The evidence that companies with market shares below the 30% threshold have been fined for restrictive agreements should draw attention to the fact that a possible anti-competitive effect can be overcome in other situations characterised by thresholds below 30%.

As suggested in the economic literature, an interesting feature to consider is the degree of asymmetry between firms in a market. In markets where firms are similar in terms of market shares, the use of vertical agreements may be optimal for all firms, which may be tempted to enter into exclusive agreements to protect their own position. Efficiency differences between firms and their strong competition reduce the risk of anti-competitive effects of vertical agreements. However, if all firms have significant market power, the risk of collusion increases and the use of exclusive contracts is an optimal strategy only for the colluding firms. Thus, symmetric competition among producers can mitigate the anti-competitive risk and prevent the restrictive nature of vertical restraints from negatively affecting equilibrium outcomes. A strategy based on restrictive contracts may only be optimal for companies with a certain degree of market power: firstly, the manufacturer must compensate the retailer for the reduced range of products to be sold; secondly, an exclusive contract must be based on a strong brand reputation. Indeed, in the case studies analysed, exclusivity is driven by a strong brand reputation for ice cream and artificial milk. Beer distribution is not based on such motivations, but is only driven by efficiency reasons, aimed at offering a better service to the outlet.

Conclusion

The traditional literature has identified two potential effects of vertical agreements, foreclosure and efficiency gains. Although they are analysed in isolation, the common assumption is that competition between producers is symmetric. However, antitrust authorities are rarely concerned with competitors of equal size competing vigorously; more often the risk of abusive conduct arises when a dominant firm competes with smaller rivals. Addressing the limitations of the previous literature, a third, more recent theoretical approach shows that exclusive dealing can have both pro-competitive and anti-competitive effects, depending on the competitive advantage of the dominant firm over its rivals. By analysing the decisions of the Italian Antitrust Authority against companies concluding restrictive vertical agreements, I am able to assess the crucial role of asymmetries in identifying cases of abuse of dominance where foreclosure effects more than offset efficiency-enhancing effects.

The result presented in this paper is a first step towards a more general project to assess the impact of vertical agreements in sectors and countries independently of, or prior to, antitrust intervention. Better measures of market concentration and productivity asymmetries are advocated, depending on the availability of richer data sets. This analysis is beyond the scope of this paper and will be the subject of future research.

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