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

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Abstract

This paper focuses on presenting a research methodology to determine whether vertical contracts between firms operating at different levels of the supply chain are efficient from the perspective of recent industrial organisation theory. In this perspective, some case studies were 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 consider in distinguishing between foreclosing and efficiency-enhancing agreements.

Keywords: Vertical restraint, market dominance, heterogeneous productivity

Introduction

The abuse of a dominant position is associated with abusive conduct and anti-competitive actions undertaken by a firm with the specific intention of acquiring, maintaining or strengthening monopoly power. This concept began to attract the attention of the European Commission with the creation of the European market to promote a fair competition in the single market. This principle is established in the Article 82 of the Treaty on European Union, which regulates the legality of vertical and horizontal agreements. Agreements

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which may prevent, restrict, or distort the competition are prohibited unless they improve the production or distribution of goods, promote technical or economic progress, and provide consumers with 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 double mark-ups, coordinating activities to better 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 in the risk of abuse of a dominant position. Indeed, the prohibition of agreements is based on EC rules 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). Thus, this means that 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 are prohibited. Most famously, the European Commission imposed a record fine of €4.34 billion on Google for 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 monopoly creation is softer and is aimed at preventing the acquisition of rivals by similar firms. At present, the main objectives of the competition policy are in the direction of the efficiency-enhancing effects and of the European market integration, mainly the maintenance of the competitive markets with the aim of being globally competitive. This approach differs from the traditional consumer surplus approach of antitrust regulation. It is mainly concerned with identifying pro and anti-competitive effects of restraints. The 30% market

[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.

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share rule has not been applied consistently in EU antitrust cases. 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.

Consequently, this paper aims to provide guidance on how to distinguish between efficient and non-efficient vertical contracts using recent industrial organisation theory. Another objective is to present some case studies related to antitrust investigations against some large companies operating in the food and beverage sector in Italy. Specifically, the analysis seeks to define the relevant market used by the authority, and to assess market power and asymmetry at the sectoral level based on firms' market shares and concentration measures. To identify anti-competitive and efficiency-enhancing effects, a competition diagram is used to qualitatively identify possible scenarios. 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 consider in distinguishing 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 can 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), and Fumagalli et al. (2012). Aghion and Bolton (1987) explain that when a buyer and a seller sign an exclusive contract, they have monopoly power over the new entrant. They can jointly determine the fee that the new entrant has to pay in order to trade with the buyer. Therefore, the main reason for signing exclusive contracts is to extract some of the surplus that a new entrant would receive by entering into the seller's market. In their study, Rasmusen et al. (1991) confirmed that anti-competitive foreclosure is a potentially serious problem as it occurs in more than two-thirds of all cases. Similarly, several papers argue that strategies to raise rivals' costs implemented through vertical restraints can be used against actual competitors in order to eliminate them or at least significantly reduce their market share. Also, it is used against potential competitors to prevent or at least delay their entry[2]. On the other hand, another strand of the literature emphasizes that exclusive contracts can, under certain circumstances, serve as efficiency-enhancing instruments by protecting the relationship-specific investment of the exclusive rights holder against opportunistic violations

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

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(Segal & Whinston, 2000; Groh & Spagnolo, 2004; De Meza & Selvaggi, 2007). As such, exclusive contracts serve as a tool to protect the investment made by the manufacturer to increase retailer sales or reduce distribution costs, regardless of the brands carried by the retailer (Besanko & Perry, 1993). Exclusive arrangements protect such investments. They keep them specific to the brand in which the supplier has invested.

However, the existing literature cannot provide a theoretical underpinning to this evidence for antitrust decisions because the two potential effects, foreclosure and efficiency gains, are analyzed 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 behaviour arises when a dominant firm competes with smaller rivals. To address the limitations of the previous literature, there is a third more recent theoretical approach that 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 & Denicolò, 2015). However, this approach is discussed in more detail in the next section.

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. According to the study of 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 the next sub-section and with another firm in a duopoly market in the following sub-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 analyze 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

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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, which is measured by the cost difference c (since the dominant firm's marginal cost is zero and the competitive fringe's marginal cost is c). Hence, 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 dominant firm's competitive advantage is relatively large, buyers with low demand are effectively locked in, allowing the dominant firm to charge monopoly prices. 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 still increases, it becomes unprofitable to exclude competitors. In this situation, the buyer buys both A and B.

Exclusive dealing is also assessed. This is an agreement whereby the buyer agrees with the seller not to deal with 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. Here, firm A has to lower its price to capture all the demand. In this case, competition shifts from each marginal unit to competition for the total 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 exclude rivals from a segment of the market more profitably. 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. Here, 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

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imposition of monopoly prices is only profitable at low levels of demand. On the price side, exclusive dealing leads 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 remains at zero, thus reducing product variety. 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 levels of demand. It also increases the market share of the dominant firm. 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 charge 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 favourable to the buyer compared to the one offered by the competitive fringe. Competitive pressure therefore 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 the 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 impact on rivals is much more severe, as they are completely foreclosed in some market segments and partially foreclosed in others. It can be said that when the dominant firm is in a better competitive position than smaller competitors with less market power, the effects of exclusive contracts are mostly negative or anti-competitive. Thus, this is because competitors are foreclosed from parts of the market in both cases.

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 $c < c^*$.

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In other words, the degree of asymmetry makes exclusive contracts anti-competitive or pro-competitive.

Asymmetric Duopoly

In the duopoly model, the dominant firm competes with a rival firm that has some 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 also offering exclusive contracts 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 can be said at this point that when the competitive advantage of the dominant firm is large, exclusive dealing tends to be anti-competitive because of its negative effects on firms' profits, prices, and social welfare. It is used as a substitute for limit pricing as a more profitable strategy to exclude rivals from 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

European competition policy does not sanction the creation of a dominant position, but only its abuse for anti-competitive purposes. However, this principle is reflected in the setting of a threshold above which the use of vertical restraints may lead to foreclosure and distortion of fair trade between EU members. The list of possible abusive practices is not exhaustive, but EU competition law usually associates the 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

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usually operate horizontally. Exploitative practices, on the other hand, require market power but work only vertically. Thus, they involve extracting surplus from a firm at different stages of the production process. An important point is that European law does not punish the creation of a dominant position, only its abuse. This means that only practices aimed at excluding competitors should be prohibited, while those aimed at increasing market power through better coordination of the vertical structure, which implies exploiting the power of each actor involved, should be allowed. For this reason, the European Commission has established a threshold above which the use of vertical restraints could constitute abusive conduct: companies with a market share of more than 30% are considered to be in a dominant position. Hence, any exploitative vertical restraint could easily take the form of an exclusionary practice. Vertical restraints are certainly useful for coordinating vertical structures, but there are issues where coordination can lead to exclusionary practices: they are anti-competitive if they prevent rivals from participating in market transactions. In understanding the exclusionary risks of vertical restraints, we need to consider two aspects: foreclosure and sustainability. The first relates to whether the contractual practice forecloses part of the relevant market; the second relates to the degree of foreclosure. Foreclosure is therefore unlawful if it denies competitors a reasonable opportunity to compete for resources necessary to operate efficiently in the market. It is also important to recognise that companies usually do not use a single vertical restraint in isolation, but rather a combination of restraints. This may increase their negative effects on the one hand and increase efficiency on the other hand. For instance, a retailer may be tempted to raise prices if intra-brand competition is reduced. A combination of exclusive dealing with quantity forcing or a maximum resale price may limit such an increase. The anti-competitive effects may be exacerbated if the distribution network is organised in such a way that several suppliers and their buyers benefit from the same vertical agreement, in which case the cumulative effect would be to worsen the competitive equilibrium in the market.

The 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, three different case studies of the food and beverage sector involved in antitrust investigations was considered to better understand how apparently similar cases could lead to different outcomes. Using the theoretical framework developed by Calzolari and Denicolò (2015), the market characteristics that could explain these different outcomes are: i)

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

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the degree of market power of the firms operating in the market, and ii) their efficiency differences. Furthermore, the case studies consider the following products: industrial ice cream, artificial milk, and beer[4]. Although the final decision of the authority was different, the vertical restraints were adopted by the leading firms for all the products.

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 operating in the market and on efficiency differences between companies operating 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' into 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 has not been 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 level of concentration 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, 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 a few important companies. Even if there

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[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.

[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*.

is no general consensus on the threshold that proves that the market is concentrated, it was assumed 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 the extent to which all active firms compete at the sectoral level. The CR4 ratio was measured and compared with another index of market concentration, the Herfindahl-Hirschman Index (HHI). 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 through the following steps:

1. The definition of the relevant market used by the competition authority;
2. Assessment of the firms' market shares;
3. The calculation of the CR4 ratio and the HHI index;
4. Assessment of market power and asymmetry at the 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, three case studies were presented 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 a market with several small competitors;
b) Symmetric firms in a market with few players;
c) Heterogeneous but symmetric 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 of impulse ice cream in the out-of-home 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

[6]The main drawback of the analysis is that, as 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 are taken from official documents. The market shares used to calculate the HHI are simply given by 1/N, where N is the number of active firms.

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of Italy, where there are no differences in consumption habits and product characteristics[7].

All the companies in 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; reference to the distributor as the source of supply 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 it does not use this equipment for the products of competitors; and 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 depending on the annual turnover in sales and quantities, the location, the seasonal activity of the counterpart, etc. The companies have explained that these restrictions help to improve supply by making it possible to better anticipate demand and thus ensure a constant supply of products throughout the territory. Here, there are very large and very small points of sale, and the result is a reduction in distribution costs through appropriate production planning. The final effect would be positive for consumers, who would enjoy a constant choice of products and lower prices. The companies agree that the removal of restrictions in their contracts could lead to a cost increase of around 4.5%. The ice cream market is characterised by a high degree of concentration, with a few large companies (4) and several smaller companies (41) with very little market power. Data on the CR4 ratio and the 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

The CR4 ratio is very high and stable over time, indicating high market concentration. The HHI index is calculated on the basis of 45 active firms. Since the 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 several antitrust proceedings on several occasions, with different final decisions:

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

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- 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 barriers to entry.
- In 2003, following a complaint by food and beverage retailers about 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, as the number of exclusive contracts had been reduced to 57% of outlets following the previous investigation. This means that the 43% of the commercial operations are free of exclusivity clauses, and such a number was expected to increase[8].
- In 2017, the top producers adopted exclusive contracts for around 70-80% of their 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. 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, preventing other firms from entering into 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 shops as the only distribution channels. It also focuses on the use of suggested prices, which are respected by almost all pharmacies.

The investigation was triggered by a report from mass retailers that they had been excluded from the distribution network, despite their repeated requests to include the formula milk in their supermarkets. The producers

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

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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 consumption rate in Europe and that the use of such products is monitored by paediatricians, who also advise on the type of formula to buy, the availability of such products in 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. No company has been fined for exclusivity concerns in this case[9]. The negative effect of their contracts is felt by 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 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 the 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 analyzed above. Nonetheless, 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 for the same market segment is a strategy that only competitive firms can maintain, as this type of contract is based on exclusivity clauses. The presence of only a 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 that firms adopt collusive behaviour as the only profitable strategy to maintain competition with powerful competitors.

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

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The Beer Market

The third competitive environment is the beer market. 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 to understand the competitive risks, and they found 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; and 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; and the designation of the distributor to be used. The authority also consulted foreign breweries that sell 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. Therefore, the use of such restrictions is justified by the need to improve the conditions of supply in order to ensure a constant supply that is better adapted to 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 HHI index are shown in Table 3 for the years 2011-2015. The CR4 ratio is lower for the previous products, indicating a higher degree of market fragmentation, which appears to be fairly 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 there are 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 set of firms entering into vertical contracts, none of which is dominant. The fragmentation of the market justifies the fact that the investigation against the leading producer did not result in the imposition of a fine on the company (or other companies), despite the fact that companies usually enter into vertical restraints. No cumulative effect was found.

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

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Developing a Competition Diagram

The purpose of this section is to find a correlation between the CR4 ratio and the HHI index in order to identify which sectors with vertical agreements were characterised by anti-competitive behaviour. All 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.

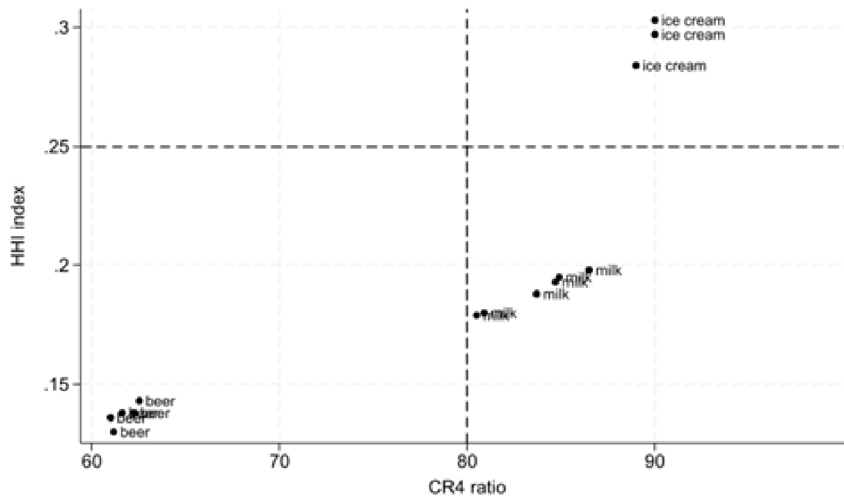

Figure 1. Scatter plot of concentration indexes, food and beverage sector

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

- Region 1: Low market concentration. There is little 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 can be harmful.
- Region 2: Low market concentration and high asymmetry of 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

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advantage; it 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 a low level of concentration. 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 were 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 only an optimal strategy 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 firms with a certain degree of market power: firstly, the manufacturer must compensate the retailer for the reduced range of products to be sold; secondly,

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an exclusive contract must be signed based on a strong brand reputation. Indeed, in the case studies analyzed, exclusivity is driven by a strong brand reputation for ice cream and artificial milk. Beer distribution is not based on such motivations, but it is only driven by efficiency reasons aimed at offering a better service to the outlet.

Conclusions

The traditional literature has identified two potential effects of vertical agreements, foreclosure and efficiency gains. Although they are analyzed 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 and 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 analyzing the decisions of the Italian Antitrust Authority against companies concluding restrictive vertical agreements, this study was able to assess the crucial role of asymmetries in identifying cases of abuse of dominance where foreclosure effects is 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, which depends 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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