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Jordi Gual (IESE Business School and “la Caixa”)

Sandra Jódar-Rosell (“la Caixa”)

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Jordi Gual and Sandra Jódar-Rosell *

As in many other antitrust cases, the delineation of the relevant product market was the critical issue in the Whole Foods and Wild Oats merger. Setting the market boundaries containing the set of products in direct competition with those of the merging parties is a very difficult task in the presence of product differentiation. The varieties produced by each of the firms differ in several dimensions. Two varieties at the opposite extremes of the differentiation dimension may end up as poor substitutes for each other. In practice, it is very difficult to draw a line in the middle of these two extremes that objectively separates the two product markets.

In an attempt to offer an objective criterion for market definition, the Horizontal Merger Guidelines issued by the U.S. Department of Justice and the Federal Trade Commission ("Guidelines") state that the antitrust agencies must delineate the product market as a group of products such that, if produced by a hypothetical profit-maximizing monopolist, would be able to profitably impose at least a small but significant and nontransitory increase in price. This approach has been known as the SSNIP test.

* Jordi Gual is professor of economics at the IESE Business School in Barcelona. He and Sandra Jódar-Rosell are, respectively, Chief Economist and Economist at "la Caixa", the largest savings bank in Europe.

Although theoretically appealing, in practice a proper assessment of the SSNIP test would be equivalent to a full quantitative evaluation of the merger.

The intuition behind the test proposed by the Guidelines is based on the reaction of consumers to the price increase. If the varieties sold by the hypothetical monopolist constitute a separate product market, most consumers would not find proper substitutes and be compelled to buy at the higher prices. On the contrary, if those varieties belong to a broader product market, consumers would find good substitutes at advantageous prices. In that case, the hypothetical monopoly would register a reduction in sales large enough to render the price increase unprofitable. Therefore, the amount of sales (or, equivalently, the number of customers) lost to competitors is key to product market definition.

This concept leads us to the notions of "marginal" and "core" customers that have been at the center of the discussion in the Whole Foods and Wild Oats merger: Customers who would switch in response to a price increase are the "marginal" customers; those who would not switch are the "core" ones. The U.S. Court of Appeals for the District of Columbia accepted the definition of a narrow product market of premium, natural and organic supermarkets ("PNOS") within the broader market of supermarkets. The D.C. Circuit based its argument on the existence of a significant number of core customers and on the feasibility of price discrimination between core and marginal customers. In our view, however, the decision relies on misunderstanding both the distinction between "marginal and core" consumers and the concept of price discrimination.

I. MARKET DEFINITION AND THE DISTINCTION BETWEEN MARGINAL AND CORE CUSTOMERS

The D.C. Circuit seems to believe that customers are inherently either "marginal" or "core" and that this status is constant through time. This misses the point that any customer can be "marginal" when he/she faces a sufficient price increase. The well-known Hotelling product differentiation model can be used to illustrate that the marginal consumer depends on the set of prices charged by all competitors.

Imagine two grocery stores, A and B, one at each extreme of a 1-mile long street, selling potatoes to 9 consumers living on that street. From the consumer's point of view, the stores are differentiated according to the distance from his/her home. Suppose that the consumer's valuation of the potatoes sold at each of the stores decreases with respect to the distance to the store: the consumer living closest to A values A's potatoes at $2 while his/her valuation for B's potatoes is $1.1. Conversely, the consumer located closest to B values A's potatoes at $1.1 and B's potatoes at $2. In other words, if consumers live 1/10 mile from each other between the two stores, and d is the distance from their home to A, they value A's potatoes as $(2.1-0.1 x d) and B's potatoes as $(1.1+0.1 x d). It is then easy to see that if both stores charge the same price, say $1, the marginal consumer for each of the stores is the one living in the middle of the street (consumer 5). This consumer is indifferent between buying potatoes at A or B since he/she derives the same surplus (the valuation net of the price of potatoes) in both stores.

Were store A to increase its price $.10 over the price of B, the identity of the

marginal consumer would shift to consumer 4. Consumer 5 would unambiguously prefer to buy the potatoes at B (with a surplus of 1.1 + (0.1 x 5)-1 = 0.6) than at A (with a surplus of 2.1 - (0.1 x 5) – 1.1 = 0.5). Taken to the extreme, if store A decided to charge $.40 over the price of B then consumer 1 (the one that could be considered a "core" customer to A given his/her higher valuation) would become the marginal consumer. Hence, the identity of marginal consumers depends on the prices charged by all the alternatives they can choose from; it is not an immutable characteristic of the individual. Notice the importance of the alternatives: the identification of the marginal consumer depends on which alternatives we consider or, in other words, on which products we include in the market definition as possible substitutes. When products differ along multiple dimensions and consumers have different preferences over these dimensions, not only the prices but also the characteristics of all the alternatives matter to correctly define the marginal consumer.

In fact, carrying out the SSNIP test properly requires a lot of information and differs little from the quantitative assessment of the likely effects of the merger on competition. Ideally, one would first like to estimate consumer demand for each of the goods that could form a broad market. Next, and starting with the merging parties, the appropriate test would be an iterative process of merger simulations in which the new equilibrium in prices (and characteristics) would be computed. At each iteration, the merged entity would be augmented with the producer of the next closer substitute. Resulting equilibrium prices could then be compared with pre-merger prices to assess

whether the merged entity could significantly increase and sustain these increased prices given the likely reaction of producers of widely defined substitute products.

A more parsimonious and yet still rigorous approach that has been frequently used relies on estimating demand elasticities. These parameters summarize the reaction of consumers to price increases: if a firm faces an own-price elasticity of 2, it means that the firm will lose 2 percent of its sales for each 1 percent increase in its prices. Elasticities can be obtained from estimating the system of demand functions that characterizes the broader market. This estimation also provides the cross-price elasticities, which calculates the change in sales of one firm when another increases its prices. In order to perform the SSNIP test, one can use the own-price and the cross-price elasticities of the products in the narrow market to assess the likely change in sales due to a given price increase.

In principle, the elasticities obtained after estimating the whole demand system carry the implicit assumption that competitors outside the narrow market do not respond to the price increase. However, if some of the firms considered in the broader market do in fact belong to the narrower one, then they will certainly respond to the price increase. In order to take this into account, one can compute the relevant elasticities by estimating the residual demand faced by the candidate products. This residual demand approach embodies the actual reaction of the firms in the broader market and thus gives a more precise indication of the "sustainability" of the price increase in the narrow market.[1]

[1] Jonathan Baker and Timothy Bresnahan, *Estimating the Residual Demand Curve Facing a Single Firm*, 6 INTL. J. INDUS. ORG. 283, 283-300 (1988)

Using the residual demand concept one could, in fact, quantify the change in the number of "marginal" versus "core" consumers after the increase in price resulting from a merger. The question raised by the SSNIP test is precisely whether the residual demand faced by the merged entity is such that the retained "core" customers are enough to make the price increase profitable.

II. THE EVIDENCE PRESENTED IN THE CASE

The evidence presented by the FTC to support its narrow definition of the relevant market was far from any of the approaches mentioned above. A first piece of evidence tried to examine the degree of substitution among different store types. The FTC compared the reaction of Whole Foods' sales and margins to the entry of both PNOS retailers and conventional retailers. A similar exercise was performed for Wild Oats. The results showed that both retailers reacted significantly more to the entry of a PNOS than to other entries. These results may indicate that PNOS are closer competitors but do not provide precise information on how prices would change were the parties to be in a monopoly position in the PNOS market. Moreover, the degree of substitutability between PNOS and conventional supermarkets is underestimated since no real first entry of a supermarket is observed—the only new entries of conventional retailers that can be observed are entries of specific retailer brands that were not present in the local markets.

As a second piece of evidence, the FTC presented an econometric analysis of the variation in Whole Foods' margins across markets with and without nearby competing Wild Oats stores. This evidence tried to provide a proxy for the increase in margins that

could arise from the change in the Wild Oats' ownership. However, the shortcomings of this exercise are not different from the ones already discussed. Moreover, we do not know whether these margin differences also reflected different sets of conventional retailers competing in local markets. Other indirect evidence presented by the FTC also seemed to show that retailers selling PNOS faced stronger competition from within their format than from other conventional retailers. This result is not surprising. Other studies of market structure point to within-format competition being stronger. However, this is not the same as asserting that conventional stores do not constrain the behavior of PNOS retailers.

Despite its shortcomings, the D.C. Circuit accepted the evidence presented by the FTC. As opposed to the district court, the D.C. Circuit dismissed the number of "marginal" customers that would be lost to conventional supermarkets and focused on the "core" customers that would be captive in Whole Foods. This approach is against the spirit of the SSNIP test which requires a comparison of the foregone sales to the "marginal" consumers who switch retailers with the increase in profits arising from the "core" customers that do not switch. Instead, the D.C. Circuit took the view that a price increase would be profitable since a significant percentage of Whole Foods and Wild Oats customers are "core" customers.

As stated before, the problem with this reasoning is that it assumes that customers are inherently "core" or "marginal." This can be seen in the two features used by the D.C. Circuit to identify "core" customers. One feature was the revealed preference of some

consumers for more expensive organic products rather than the cheaper conventional ones. Indeed, the percentage of Wild Oats customers who expressed their willingness to switch to Whole Foods in the event of Wild Oats exiting the market is taken as the percentage of "core" customers.[2] Another feature seems to be the number of stores visited by the consumer. In this case, the percentage of Whole Foods or Wild Oats customers who do not cross-shop in other stores is taken also as a measure of "core" customers.[3] However, these two features of consumer behavior are defined for a given set of retail prices (and other format characteristics) and could certainly be reversed in the event of a sufficient price increase, thus changing the boundary between core and marginal customers.

III. CORE CUSTOMERS AND PRICE DISCRIMINATION

The D.C. Circuit's justification for focusing on "core" customers was the theoretical possibility that these customers could face discrimination in terms of price. Through price discrimination, the D.C. Circuit argued, the merged entity could increase prices to "core" customers without losing sales to "marginal" ones. Ignoring for now the problems with the definition of "core" customers, let us focus on the use of the price discrimination concept.

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[2] *FTC v Whole Foods Market, Inc*. 533 F.3d 869, "[…] if a Wild Oats near a Whole Foods were to close, the majority (in some cases nearly all) of its customers would switch to the Whole Foods rather than to conventional supermarkets. Since Whole Foods's prices for perishables are higher than those of conventional supermarkets, such customers must not find shopping at the latter interchangeable with PNOS shopping. They are the core customers." *available at* http://www.ftc.gov/os/caselist/0710114/080729wholefoodsopinion.pdf, 18

[3] *Id*. "[…] when one or a few firms differentiate themselves by offering a particular package of goods or services, it is quite possible for there to be a central group of customers for whom "only [that package] would do. […] Because the core customers require the whole package, they respond differently to price increases from marginal customers who may obtain portions of the package elsewhere." Available at http://www.ftc.gov/os/caselist/0710114/080729wholefoodsopinion.pdf, 15

Price discrimination involves charging a different price for the same product to different consumers (or the same price to consumers with different costs). In the context of grocery retailers and multiple stock-keeping units ("SKUs"), price discrimination at the SKU level can be practiced, for example, through the use of loyalty cards. Card holders are rewarded with lower prices on some products. The loyalty card is an observable characteristic used to identify loyal consumers. Indeed, price discrimination is only possible if consumers with the highest willingness to pay can be identified and if the arbitrage of the relevant product can be prevented.

However, the D.C. Circuit seems to have in mind another interpretation of price discrimination. In the case of Whole Foods, they argued that price discrimination involved charging higher prices in organic products relative to dry groceries. In their view, "core" customers would face a higher price for their basket of products than would marginal customers, who can purchase part of their basket elsewhere.

Notice, however, that the two baskets of products these consumers purchase are different, since they include products with different attributes. Since the products offered by Whole Foods are not tied, consumers are free to tailor the basket of products purchased at Whole Foods. They will do so by comparing the net utility derived from the product variety purchased at Whole Foods with that of a variety purchased elsewhere and take into account the costs associated with visiting an additional retailer. The absence of tying schemes implies that "core" customers, as defined by the D.C Circuit, do not face more expensive prices at the SKU level than those faced by "marginal" customers if they

were to decide to continue shopping at Whole Foods.

IV. CONCLUDING REMARKS

It may be interesting to close this brief discussion of the complexities of product market definition in grocery retailing with a short summary of the approach taken in Europe. In general, the attitude of the European competition authorities towards mergers in this industry is more permissive than in the U.S.[4] This attitude, which may have influenced the definition of the relevant market, seems to derive from the belief held by the European Commission ("Commission") that consolidation at the retail level could lead to cost reductions through better terms obtained from the manufacturers.

The definition of the relevant product market was established in the Kesko-Tuko merger.[5] In that decision, the Commission recognized the existence of multiple store formats, each of them of different size, offering more or less broad product assortments with different levels of quality. Nevertheless, the key feature that was identified in order to establish different product markets was the ability of each of the formats to provide food products in a one-stop shopping trip. Using this principle, two relevant markets are considered. The main one is "the retail market for daily consumer goods comprising all modern distribution channels (hypermarkets, supermarkets and discounters)." Retail sales at traditional specialized stores, kiosks, and petrol stations are considered to constitute a separate but complementary market.

[4] Dobson Consulting, Buyer power and its impact on competition in the food retail distribution sector of the European Union (1999), *available at* http://ec.europa.eu/comm/competition/publications/studies/bpifrs/.

[5] Commission Decision, Case IV/M.784, Kesko/Tuko (12/19/1997), *available at* www.sei.gov.mk/TU/EN/31997D0409.doc

Contrary to the U.S., no specific econometric analyses were used to establish this market definition. Instead, the decision relied upon the observation of a wide variety of shopping habits of consumers and the width of product assortments by grocery stores. Nevertheless, the Commission's view was confirmed in a sector investigation performed by the UK Competition Commission.[6] This investigation stressed the importance of one-stop shopping among all of the consumers' motives to visit a particular retailer. It also confirmed that retailers regularly check their prices against those of other format retailers, thus supporting the intuition that supermarkets, hypermarkets, and discounters do place some constraints on each other. More recently, the Commission used some evidence of pricing policies of hypermarkets in the Czech Republic to emphasize that discounters and hypermarkets were indeed competing in the same product market (see the Carrefour – Tesco merger[7]). It is clear that discounters create a format category which is comparable to the PNOS in the US market, even if placed at the lower and not the upper end of the price spectrum.

In sum, defining product markets in grocery retailing is fraught with difficulties, given the large degree of product differentiation in the industry and the fact that competitors sell many different products. The theoretical basis for rigorously defining the market is, of course, well understood. However, in practice agencies and courts must base their decisions on poor proxies of the relevant theoretical parameters. Therefore, it is of the utmost importance that the use of indirect evidence be firmly rooted in a precise

[6] U.K. COMPETITION COMMISSION, SUPERMARKETS: A REPORT ON THE SUPPLY OF GROCERIES FROM MULTIPLE STORES IN THE UNITED KINGDOM (2000) *available at* http://www.competition-commission.org.uk/rep_pub/reports/2000/446super.htm#full

[7] Commission Decision, Case No COMP/M.3905, Tesco/Carrafour (12/22/2005), *available at* http://ec.europa.eu/comm/competition/mergers/cases/decisions/m3905_20051222_20310_en.pdf

definition of the key economic concepts. It appears that the D.C. Circuit's overruling of the district court in the Whole Foods case is based on an unorthodox use of such key economic concepts as marginal consumers and price discrimination. As the European practice shows, the difficulty of empirically assessing the value of the key theoretical parameters should lead agencies to a conservative assessment of market boundaries and to a wide market definition.