

## MARKET DEFINITION WITH RESPECT TO GROCERIES IN THE UK

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### EXPERIENCE AND INSTRUCTIONS

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I have been asked by counsel for Tesco to evaluate several submissions by Tesco and Frontier Economics to the UK Competition Commission (CC) and a number of documents published by the CC concerning geographic market definition in the grocery sector. A list of these documents is attached in the Annex. I have been asked to review and critique the SSNIP test analysis carried out by Tesco and Frontier Economics and to comment on the methodological issues raised by the CC. In particular, I have been asked to evaluate the use of the geographic market definition test that poses the question of whether a hypothetical monopolist (HM) would find it profitable to impose a SSNIP (a small but significant and non-transitory increase in price) test in this geographic market definition analysis. A relevant market is the smallest market in which such a price increase would be sustainable.

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### 1. OVERVIEW

1.1. The CC has taken the preliminary view that grocery markets should be defined locally and that relevant local geographic markets are relatively small in size. I understand that in previous inquiries the CC has used a geographic market definition based on a 10 minute drivetime around a store in urban areas and a 15 minute drivetime in rural areas.

1.2. The CC and Tesco agree in principle that the hypothetical monopolist (HM) – SSNIP test should be applied to evaluate market definition issues if it is empirically feasible to do so.

1.3. Tesco disagrees with the CC's previous product market definition, but has accepted it for the purposes of argument. On this basis Tesco has carried out a SSNIP test exercise and has found that geographic markets based on 10 and 15 minute drivetimes around stores are too small with respect to the vast majority of locations throughout the UK. CC and Tesco apparently disagree as to the success of the market definition exercises carried out by Tesco and the CC has raised a number of methodological questions concerning Tesco's analysis.

1.4. My opinions, in brief, are as follows:

- (a) Whenever feasible empirically, the HM – SSNIP test is the appropriate methodology to be used to assess market definition.
- (b) The approach advocated by Tesco offers a sensible and valid methodology.
- (c) Tesco’s conclusion that geographic markets have been viewed too narrowly by the CC is compelling.
- (d) The particulars of the market definition analysis are potentially sensitive to a number of empirical assumptions, and also sensitive to some theoretical methodological assumptions. CC has properly raised questions concerning both empirics and theory. While the comments and questions of the CC are generally valid, I remain comfortable with Tesco’s conclusion (in (c)) concerning the geographic breadth of the relevant markets.

1.5. In the sections which follow I set out in detail my opinions on the following specific issues.

- The applicability of the SSNIP test methodology to geographic market definition in the UK grocery market.
- The assumptions which underlie Tesco’s approach to applying the SSNIP test methodology.
- The implications of the results of the SSNIP test for UK grocery markets.

## 2. APPLICABILITY OF THE SSNIP TEST

2.1. It is my understanding that the market definition exercise being undertaken here is independent of any particular acquisition or investigation of specific business practices that might be seen as restraining trade or monopolizing markets. It is my view that *as a matter of economics*, it is not always necessary to find a relevant market or markets in order to evaluate the potential competitive effects of an acquisition or to evaluate certain business practices.<sup>1</sup> However, I have been advised that, *as a matter of UK law*, a market definition exercise is required in this Inquiry.

The remainder of this report therefore proceeds on this basis.

2.2. [REDACTED]<sup>2</sup> I believe that, when applicable, the test offers a methodologically valid and reliable approach to both product and geographic market definition. In the large majority of cases with which I am familiar, the SSNIP test was applied to product and not geographic market definition. However, this is primarily due to data limitations which occasionally make it difficult or impossible for the SSNIP test to be applied with respect to product market, and frequently make impossible the application to geographic markets. With respect to the grocery industry in the U.K, substantial data are available, and while

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<sup>1</sup> [REDACTED]

<sup>2</sup> [REDACTED]

potentially complex in practice, I see no major impediments to the use of the SSNIP test here.

2.3. I believe that the isochrone analysis is methodologically appropriate as a means of describing consumer shopping patterns. As Tesco correctly suggests, this should represent the starting point, not the ending point of an analysis of relevant geographic markets.

### ***Population recentring***

2.4. The CC has suggested that it may be appropriate to use “population recentring” as part of a market definition exercise. I am not convinced that recentring is appropriate for a market definition analysis. The analysis of market definition should begin with a store or group of stores, not with the underlying population. Once the store or stores have been chosen, one should look at the population distribution to see which households are within travelling distance of the store.

2.5. Even then, an appropriate SSNIP exercise will distinguish marginal customers from those who are unlikely to switch, so population recentring is not necessary. The SSNIP analysis also has the advantage of taking into account implicitly the fact that the hypothetical price increase harms all customers whether they are located close to a store or not – those that do not switch pay high prices, while those that do switch bear higher travel costs.

## **3. ASSUMPTIONS OF THE SSNIP TEST**

3.1. I am in full agreement with the description of the correct test – the SSNIP test – that is set out at paragraphs 2.2 and 2.24 of the CC’s Market Investigation Reference guidelines.

3.2. Tesco first presents its SSNIP approach in its paper, “Further Evidence Supporting Our View there is a National Geographic Market” submitted to the CC on 8<sup>th</sup> December 2006, and the related slide presentation, “Geographic Market Definition and the SSNIP test”, presented at a staff meeting with the CC on 31<sup>st</sup> January 2007. The details of the methodology are spelled out on pages 2-14 of the initial submission and the methodology is applied to 20 local areas. More extensive results covering the whole country, sensitivity analyses, further methodological comments, and responses to questions put by the CC, are presented in Tesco’s response to the Market Definition Working Paper (in particular, in Annexes A and B of that document), submitted to the CC on 23<sup>rd</sup> February 2007.

3.3. The Tesco description of the application of the SSNIP approach is very clear. It is important to note that in any exercise of this kind, if the exercise is to be successful, one must of necessity make simplifying assumptions. The Tesco analysis makes its assumptions very transparent, and in most cases those assumptions are conservative, i.e., if there is bias, the bias points in the direction of the analysis finding markets to be smaller than would actually be the case.

3.4. In one case (the assumption of no price discrimination between stores) the possibility of bias does point towards the markets being found to be too large. However, I find it unlikely that, in practice, such price discrimination would be effective. Furthermore, I have not seen evidence that supports the possibility of such pricing in the UK grocery market. Notwithstanding this conceptual point, I remain comfortable with Tesco's conclusions from the application of the SSNIP test that the geographic breadth of the relevant markets is wider than the CC previously found.

3.5. In the comments that follow, I point to some of the assumptions in the analysis and what, if any, bias they might introduce.

### ***Basket size distribution***

3.6. The presentation assumes that customers with the largest market baskets are most likely to switch. This is a reasonable starting assumption for the analysis. The assumption of variation across consumers is both important and reasonable; it is appropriate to expect that those purchasing larger market baskets are more likely to switch than those purchasing smaller baskets. Put somewhat differently, those buying larger market baskets are likely to have a more elastic demand than those buying smaller baskets.

3.7. The assumption that the distribution of basket sizes is the same for all locations also has the potential to lead to bias. If (as the CC also points out) shopping patterns vary with demographics, and demographics and location are correlated, there could be some locations where customers are more or less likely to switch (compared to the average). One possibility for bias would arise if households whose demands were relatively price elastic were close to stores near the center of the proposed local market. A market definition analysis based only on average market baskets might overstate the degree of switching that would occur in response to a hypothetical price increase. However, for this or other possibilities to lead to a systematic bias in the results, the locational patterns and inclinations to switch would need to be systematic. I have seen no evidence to suggest that such patterns exist and therefore no evidence that accounting for distribution of basket sizes would bias the overall results either in favour of wider or narrower markets.

### ***Store margins***

3.8. In order to evaluate the impact on profits of a SSNIP, it is necessary to make an assumption about the margin a hypothetical monopolist could make on the customers that remain after the SSNIP. Tesco's report correctly notes that, in determining this margin, it is important to ask to what extent costs would be reduced if sales were to decline in response to the 5% price increase.

3.9. Tesco assumes that the appropriate margin is the store gross margin less any such costs that could be saved. Tesco determines this by delineating which costs are variable and which are fixed. This is the appropriate exercise to undertake. Tesco's central case assumes that the right margin nets out half of payroll and other store costs. These assumptions seem reasonable at first blush, although the exact choice of which costs

could be saved is an empirical matter. I note that these assumptions are updated slightly in Annex A of Tesco's response to the Market Definition Working Paper to reflect the views of Tesco in how it runs its business internally. In Annex B, Tesco has responded to the CC's request for a sensitivity analysis of Tesco's margin assumption (Query I in Annex B). Tesco shows that the conclusion that narrow local markets are generally not sustained does not change if the margin [ $\mu$ ] is increased or decreased by 2 percentage points. Thus, the Tesco results are reasonably robust to variations in margins. While it seems clear that a substantial further decrease will affect the results, as will the possibility of price discrimination (which will affect margins differently for some stores than for others), I have not seen empirical evidence to support either.

3.10. The time period during which costs can be changed in response to the reduction in demand is an important assumption. Tesco chooses one year, citing the CC. One year is an appropriate choice if one is to evaluate mergers or strategic policies that are expected to have a long-lasting effect. It is conceivable that a shorter time horizon would be appropriate if the issue at hand involved strategic behavior that was not expected to be in place for a lengthy period of time. If so, a greater proportion of store costs would be likely to be fixed and so the hypothetical monopolist would lose more money on every customer that switched away. In this case, Tesco's approach would tend to underestimate the size of local markets.

### ***Cost of travel***

3.11. The estimation of cost of travel using a multinomial (conditional) logit model is a reasonable choice. In my opinion, the assumption of a single cost of travel for all customers is necessary in order to make the SSNIP test exercise feasible; and, based on the sensitivities presented in Tesco's work, I would not expect this assumption to bias the results. In the Tesco analysis, the cost of travel time for customers is assumed to be the same regardless of basket size. As suggested previously, if there was a systematic relationship between the cost of travel time and the basket size this could lead to a systematic bias in the results. I note from footnote 53 of Annex A of the Response to the Market Definition Working Paper that Tesco has tested this relationship and found that customers with larger baskets have lower costs of travel time and have a higher propensity to switch than was presumed in the Tesco analysis. If this fact alone were taken into account, it would, if anything, support a broader geographic market.

3.12. The CC has raised a more general and valid empirical point – that travel times may vary by income and location. The important question to ask here is whether the cost of travel assumption used is appropriate for marginal customers. If marginal customers were systematically different from the average in terms of income and location, this could bias the results of the SSNIP exercise in either direction.

3.13. It is important in analysis of this kind to account for variations in travel times, for example by urban and rural areas. I understand that the software employed by Tesco for this analysis can account for a large number of factors affecting travel times – for example time spent at junctions and average driving speeds – disaggregated at the level of individual roads. Moreover, the tests for robustness given by Tesco in support of the

conclusion that geographic markets based on 10 and 15 minute drive times are too small would be unchanged given reasonable levels of variation in the cost of travel time. I note that Tesco's estimate of the cost of travel time was originally about 10 percent too high due to an empirical error affecting the original submission, but this did not change Tesco's substantive conclusions.

3.14. The CC also raises a point about information costs that is consistent with a point that I made previously. I agree with the CC and Tesco that if switching costs were indeed higher, there would be less switching. In the section headed Query E in Annex B of Tesco's response to the Market Definition Working Paper, the CC's questions as to what extent Tesco's empirical analysis would change if it were to account for the fact that consumers choose stores based on a host of factors in addition to price. This is a valid conceptual point, although its empirical implications are not clear. Tesco correctly points out that if there was any bias, as a matter of theory the bias could go in either direction. Tesco concludes that there is no systematic bias. I conclude only that there has been no showing of bias, and I have no expectation that any such bias will be substantial in magnitude.

#### ***Size of the SSNIP***

3.15. In the U.S., the competition authorities sometimes use a 10% test along with a 5% test when doing the hypothetical monopolist test. If a 10% test had been used, it is almost certainly the case that the relevant markets would be as large as or larger than those that are determined using a 5% test.

#### ***Product market***

3.16. Assuming a one-stop shopping product market and a 10-minute isochrone in urban areas and a 15-minute isochrone in rural areas is an appropriate starting point for the analysis. Using the CC's limited competitor set tends to make the analysis conservative, since customers are assumed not to switch their purchases to smaller stores within the geographic market. Any bias to the results would point towards defining markets too narrowly. Indeed, if such a level of switching were to be significant this would point towards a product market definition which was also too narrowly defined.

#### ***Assigning customers to their nearest store***

3.17. The starting point for the Tesco SSNIP exercise is to assign every customer to their nearest store. The assumption that customers shop at their nearest store is reasonable (I note that it is consistent with, but does not directly follow from, the view that the analysis is focusing on local markets).

3.18. In an ideal world, the analysis would be more sophisticated; one might use survey and market data to estimate household choice functions for the local stores taking into account variations in PQRS. The estimated demand functions could then be used as part of the SSNIP test analysis. In practice, such an approach is not feasible. It is not clear

whether this assumption is conservative or not. On one hand, if the product market is differentiated and customers are willing to travel greater distances to shop, the relevant isochrones will be larger. On the other hand, if consumers value certain store attributes highly and not all stores have those attributes, they may be less likely to switch in response to a hypothetical price increase.

3.19. The CC raises the question of whether the analysis might be biased if consumer choices are dependent not only on P, but also on Q, R and S. It is possible that accounting for PQRS in a household choice framework could affect the scope of the relevant market. The direction of the effect cannot be determined theoretically – it would depend on a complex set of issues relating to household locations and preferences. It is important to note, however, that it is rare for any market definition analysis to account for all of these factors. Moreover, I have had some experience with product market definition – in a number of cases I found that accounting for variations in non-price factors did not bias the results. Absent further evidence to the contrary, therefore, I would be inclined to assume that a neutral – no bias – presumption is reasonable.

3.20. Customer choice data are disaggregated to the level of Census Output Areas. I am not familiar with these census data; however, the data set being utilized here is highly disaggregated, and in this respect is likely to be more than satisfactory for the task at hand.

3.21. Finally, the analysis appears to assume that consumers that do not switch will buy the same market basket at the higher price. It is worth considering the possibility that rather than switch, some households would choose to reduce their consumption and not change stores. Accounting for this possibility is unlikely to affect the analysis significantly, since most households' demands for groceries are likely to be inelastic.

#### ***No price discrimination between stores***

3.22. Throughout its various presentations, the CC raises the possibility of store-by-store price discrimination on the part of the grocery chains. This is an important issue because price discrimination will almost certainly support narrower relevant markets. An analysis of a price discriminating hypothetical monopolist, if feasible, would be an appropriate exercise if it were the case that price discrimination was or is reasonably expected to be a significant practice amongst the stores in the hypothetical market. The evidence I have reviewed suggests that this is not currently the case in the UK grocery market. The CC has concluded that the extent of adjustments to prices at the local level is small; the four largest retailers all operate national pricing with limited local discretion; and I understand that those which do not (Costcutter, CGL and Somerfield) typically operate smaller stores which would not typically be included in the 'one stop shopping' market considered by the SSNIP analysis. Tesco's own analysis suggests that the average level of local price variation is 0.05%.

3.23. Moreover, it is my opinion that accounting for price discrimination would be quite difficult in the model, and if undertaken, it would almost certainly involve a complex set of simulations whose relevance would be difficult to ascertain.

3.24. I do agree with the CC that the fact that a consumer's mission is not observable at the time of entry into a store does not rule out price discrimination as a *theoretical matter* (which could conceivably arise for example through marketing efforts based on loyalty cards). However, I doubt that such price discrimination is likely to be effective in practice because it would be very difficult for grocery stores to identify appropriate "marginal" customers. Furthermore, the CC has not presented sufficient evidence to convince me that this argument should be given much weight.

3.25. My own perspective, based on past experience with supermarkets in the United States, is that there is a reasonable degree of price variability across stores and locations, but that this variation is not the result of explicit price discrimination, or at least a strategy or strategies that are likely to be relevant for market definition. In the U.S., most "frequent shoppers" receive discounts on a variety of products, but (i) it is easy to obtain a frequent shopper card from a range of stores; (ii) it is not at all clear how a grocery chain could use frequent shopper information to devise an effective price discrimination strategy, one that offered lower prices to customers whose demand was most price elastic; and (iii) even if such discrimination were possible, arbitrage (between customers or intermediaries) could diminish its effectiveness.

3.26. Given these considerations, I believe the Tesco analysis is a reasonable application of the SSNIP test. In my opinion, if feasible analyses involving a price discriminating hypothetical monopolist should be treated part of a range of sensitivity test to the central analysis as currently submitted.

#### **4. RESULTS OF THE SSNIP TEST ANALYSIS**

4.1. Tesco first concludes that the CC should carry out the SSNIP test in each area before making any conclusions on local markets. It is my understanding that, as a matter of UK law, the CC is required to find a feature of a market which prevents, restricts or distorts competition, and therefore to define the relevant market(s). I have not been asked to comment on the necessity for market definition in the inquiry *as a matter of economics*. Nonetheless, I strongly agree with the view that one cannot determine relevant geographic markets simply by observing that consumers shop locally.

4.2. Tesco's initial analysis applied the SSNIP test to 20 Tesco stores, 14 urban and 6 rural. The resulting calculations show that the assumption that each local market is determined by a 10- or 15-minute isochrone around each Tesco stores is not supported. Tesco widened the isochrones by 5 minutes and found that the SSNIP test still failed in all 20 areas. It seems clear that these markets would be incorrectly defined if 10-minute urban drivetimes and 15-minute rural drivetimes were utilized.

4.3. Tesco's expanded analysis, covering all Tesco stores in Great Britain also supports the view that most markets would be incorrectly defined if 10-minute urban drivetimes and 15-minute rural drivetimes were utilized. Indeed, Tesco's results suggest the considerable majority of these markets are at least 30 minutes wide.

4.4. I agree with the CC and Tesco that there is no separate chain of substitution argument for market definition – the chain of substitution flows from the SSNIP test. As a result, the SSNIP test *in itself* does not demonstrate that the relevant market is national, as recognised by Tesco. Indeed, it is doubtful to me that an extension of the SSNIP would *in itself* support such a broad market. Whether a national market is appropriate would depend on the extent to which there are constraints that substantially limit the ability of firms to operate local or subnational policies, as discussed by Tesco in its Overview Response to the Emerging Thinking. Empirically assessing the magnitude of these factors is beyond the scope of this report.

4.5. Tesco reiterates (correctly) that the fact that customers tend to shop locally does not mean that markets should be defined locally. [X]

## 5. ANNEX: LIST OF DOCUMENTS RECEIVED

5.1. In preparing this report I have relied exclusively on the material provided to me in the following documents:

- (a) Competition Commission, *Working paper on market definition*.
- (b) Competition Commission, *Follow up questions from the bilateral market definition staff meeting on 31 January 2007, letter*, 15th February 2007.
- (c) Competition Commission, *Safeway plc and Asda Group Limited (owned by Wal-Mart Stores Inc); Wm Morrison Supermarkets PLC; J Sainsbury plc; and Tesco plc: A report on the mergers in contemplation*, Chapter 5, September 2003.
- (d) Frontier Economics, *Geographic market definition and the SSNIP test*, a presentation to the Competition Commission, 6th February 2007.
- (e) Tesco, response to Question 1 of the *Main Parties Questionnaire*, submission to the Competition Commission.
- (f) Tesco, *Further Evidence Supporting our View That There is a National Geographic Market*, submission to the Competition Commission.
- (g) Tesco and Decision Technology in association with the University of Warwick, *Total Customer Cost: Superpanel Models*, 18th April 2006.
- (h) Tesco, *Further detail on the implementation of the TCC framework*, submission to the Competition Commission.
- (i) Tesco, *Response to Emerging Thinking, Overview Response*, submission to the Competition Commission

- (j) Tesco, *Response to Emerging Thinking Market Definition Working Paper*, submission to the Competition Commission.
- (k) Tesco, *Local concentration and PQRS measures*, submission to the Competition Commission.
- (l) Tesco, *Questions on Local Concentration and PQRS, letter*, 14th March 2007.