



# Geographic Market Definition: A Response to Tesco and Professor Hausman

RBB Economics, August 2007

## 1 Introduction

The primary purpose of this paper is to respond to the papers recently submitted to the Competition Commission (CC) by Tesco and Professor Hausman on the subject of geographic market definition.<sup>1</sup> These papers were themselves partially a response to a paper on geographic market definition submitted to the CC by RBB Economics on behalf of Sainsbury's ("the RBB Paper").<sup>2</sup> In that paper we identified a number of potential shortcomings in the quantitative model used by Tesco to support its view that the relevant geographic markets are at least 30 minutes wide in almost all cases. We also commented more generally on the role of quantitative modelling within the application of the SSNIP test concept.

We appreciate that the CC will carefully review Tesco's two recent submissions, and so do not seek to provide a line-by-line response. We instead focus on addressing Tesco and Professor Hausman's arguments on the relevance of price flexing to geographic grocery market definition. We argue that the scope for price flexing in the grocery industry must be taken account of if market definition is to serve its intended purpose as a framework within which to analyse the effects of market features. Moreover, using a model similar to that constructed by Tesco, we demonstrate that Tesco's failure to accommodate the possibility of price flexing plays a material and significant role in producing the breadth of markets it claims to find. Illustrative sensitivity tests demonstrate that introducing the possibility of price flexing reduces the apparent market size by at least 60%.

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1 Response to RBB Economics, Tesco, July 2007; An assessment of geographic market definition in the UK groceries market, Professor Jerry A. Hausman, 16 July 2007.

2 Geographic market definition in grocery retail, RBB Economics, 13 June 2007.

The secondary purpose of this paper, however, is to reiterate our views on the role that Tesco's quantitative model should play within market definition. The CC has assembled a range of evidence against which to consider market definition, including empirical evidence on consumers' and retailers' actual behaviour. A quantitative model based on assumed behaviour represents an additional source of evidence, but, as with all sources of evidence, will have its weaknesses. In the present circumstances even the best conducted modelling exercise cannot be regarded as providing a sufficient mirror of reality. In such a complex market as grocery retailing numerous consumer, retailer and store attributes simply cannot be modelled without making subjective assumptions. On this basis, we believe it would be dangerous to use any one particular model to define geographic markets. Indeed, CC guidelines indicate: "it is generally not possible to apply the SSNIP test in any direct sense".<sup>3</sup>

Moreover, where a model such as Tesco's gives conclusions contrary to real-world consumer behaviour and to the implications of other sources of evidence, such as those assembled by the CC, it is essential carefully to assess the role of the assumptions made by the model in driving its results, and the sensitivity of those results to changes in the assumptions. The fact that our sensitivity test indicates that price flexing alone plays such a significant role in driving the results claimed by Tesco casts serious doubt on the reliability of Tesco's model.

## 2 Market Definition Framework

The exchange of papers that has taken place since the publication of the results of the original Tesco modelling has very largely focussed on the assumptions made by Tesco in that model. This paper continues that debate, considering in some detail how the possibility of price discrimination should impact on the way geographic markets are defined.

However, in getting drawn into a detailed debate about the suitability of specific assumptions of the model, there is a risk that quantitative modelling comes to be seen as the primary source of evidence on the extent of the relevant geographic market. We believe that this would be wrong.

As previously stated, we agree that the SSNIP test provides the correct conceptual framework for the definition of relevant markets.<sup>4</sup> However, as the CC notes: "it is generally not possible to apply the SSNIP test in any direct sense...it is usually necessary for the Commission to infer, from whatever information is available or can be collected, what the likely outcome of the SSNIP test would be".<sup>5</sup> The strength of the SSNIP framework is therefore in providing a coherent structure within which numerous pieces of evidence may be considered and weighed. Quantitative modelling can provide one such source of evidence. Inevitably such quantitative modelling will require the use of simplifying assumptions to make the analysis tractable, and there will often be considerable scope for disagreement over the merits of those assumptions.

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3 Paragraph 2.11, Market investigation references: Competition Commission guidelines, Competition Commission, June 2003.

4 Section 2, Geographic market definition in grocery retail, *op. cit.*

5 Paragraph 2.11, Market investigation references: Competition Commission guidelines, *op. cit.*

The apparent precision with which market boundaries can be calculated with such models should not automatically lead to the theoretical findings of such models prevailing over other sources of real-world evidence.

The current inquiry has already considered a number of pieces of real-world evidence, including:

- a margin concentration study;
- a store entry analysis;
- an analysis of retailers' land holdings;
- evidence of grocery shoppers' characteristics and behaviour; and
- information from retailers' internal business plans.

The CC has also considered the evidence provided by Tesco based on its quantitative SSNIP model. Each of these analyses has strengths and weaknesses. However, most of these pieces of evidence point to narrowly cast geographic markets of around 10 to 15 minutes in scope. It is only the quantitative model submitted by Tesco that points to geographic markets in excess of 30 minutes drive-time (and, in some cases, significantly so). This therefore requires rigorous evaluation of the construct of the Tesco model and the underlying assumptions.

Using data provided by Sainsbury's we have constructed a model similar to that advocated by Tesco.<sup>6</sup> Within this model we find that changing just a single assumption, specifically allowing a hypothetical monopolist to pursue the "ring-fencing" strategy discussed in the next section, significantly changes the findings of this model. Following this single modification of the model, the average drive time implied the sample of stores we investigate falls significantly from the distances found by Tesco. The sensitivity of Tesco's model to the introduction of a more realistic approach to pricing casts serious doubts on its relevance to geographic grocery market definition.

### 3 Tesco Objections

The RBB Paper criticised Tesco's quantitative SSNIP model on a number of grounds, identifying several aspects of the methodology used and assumptions made that may have led to a finding of geographic markets significantly wider than suggested by other evidence assembled during this inquiry. Contrary to the approach assumed within the Tesco model, we suggested that a hypothetical monopolist may vary the price charged at its stores. In particular, we suggested that a "ring-fencing" strategy, whereby a retailer raised price only at a central core of stores insulated from rivalry on the edge of a candidate market, may lead to the identification of

relevant markets significantly narrower than those claimed by Tesco. Tesco has objected to the “ring-fencing” strategy set out in the RBB Paper on both theoretical and practical grounds. We respond to these objections below.

### 3.1 Theoretical Objections

The primary theoretical objection made by Tesco to the analysis contained in the RBB Paper is that a 5% increase in price at only one store within a candidate market would not constitute a SSNIP as required by the standard test. Tesco argues that the SSNIP test requires that the hypothesised price increase average 5% across the entire market. On this basis, Tesco argues that “ring-fencing” is “theoretically incorrect” as a means for defining markets.<sup>7</sup> Professor Hausman makes the more agnostic statement that “a question arises about how the SSNIP test should be applied”.<sup>8</sup>

We note that in its analysis of the Tesco model, the CC has investigated the effect of relaxing the uniform pricing assumption whilst meeting the condition that the average price increase be at least 5%.<sup>9</sup> We presume that this approach was taken in order to demonstrate the unreliability of Tesco’s findings, rather than necessarily indicating that the CC agrees with this approach. Nonetheless, we feel that this is an unwarranted concession, and set out below the reasons for which we believe that there is no theoretical requirement within the SSNIP test that a uniform or average 5% price increase be imposed across the entirety of a relevant market.

#### 3.1.1 The Approach to the Application of a SSNIP

Tesco has asserted that a SSNIP should average 5% across all sales made by a hypothetical monopolist, but provides no theoretical basis for this view. Its position finds no support in the wording of the test (as set out in the CC guidelines), which asks “whether a hypothetical monopolist of a certain product or set of products, which might constitute a market, could profitably impose a small but significant non-transitory increase in price”.<sup>10</sup> This formulation imposes no requirement that the SSNIP fall across all of the products under the control of the hypothetical monopolist, whether uniformly or on average.

Moreover, we consider that it is correct not to do so. As the CC notes, market definition should not be considered “an end in itself, but rather as a framework within which to analyse the effects of market features”.<sup>11</sup> Geographic markets should therefore be defined so as to identify areas where concentrated ownership may give rise to market power sufficient to lead to a material

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<sup>6</sup> This model and the sensitivity analyses conducted are presented as an annex to this paper.

<sup>7</sup> Paragraph 2.17(a), Response to RBB Economics, *op. cit.*

<sup>8</sup> Paragraph 21, An assessment of geographic market definition in the UK groceries market, *op. cit.*

<sup>9</sup> Paragraphs 22 *et seq.*, Quantitative analysis working paper, Competition Commission, August 2007.

<sup>10</sup> Paragraph 2.4, Market investigation references: Competition Commission guidelines, *op. cit.*

<sup>11</sup> Paragraph 2.2, *ibid.*

restriction or distortion of competition. The “ring-fencing” approach set out in the RBB paper identifies those situations where a firm may have the ability and incentive to raise prices by 5% to all consumers shopping at a particular store. As such it achieves the end of identifying areas where an appropriate set of market features (i.e. concentrated ownership) may give rise to a restriction or distortion of competition (i.e. a 5% price rise for all customers at a particular store).

On the other hand, a requirement that any price increase must average 5% across all consumers within the hypothesised market, would fail to identify all such areas. The Tesco approach would result in the definition of markets within which the degree of concentration conveys almost no useful information about the likelihood of a restriction or distortion of competition arising. In our view, such an approach is therefore inconsistent with the purpose of market definition as a tool of competitive analysis. In other words, the “ring-fencing” approach clearly identifies situations of potential competitive concern whilst the average price formulation of the test advocated by Tesco risks missing many such situations.

Professor Hausman appears to argue that a 5% SSNIP must fall across the entirety of a candidate market in order to create sufficient potential for harm to be of concern.<sup>12</sup> In effect, Professor Hausman argues that the purpose of the test is to define a threshold of harm below which regulatory intervention would be inefficient or disproportionate. Whilst it undoubtedly makes sense to have such a threshold, it is illogical to define that threshold in terms of the number of consumers suffering harm as a proportion of some larger group. Under such an approach, the imposition of a SSNIP on 1,000 of 1,500 customers (i.e. 66%) would be considered more problematic than an equivalent SSNIP paid by 10,000 customers amongst 50,000 (i.e. 20%).

In the case of the retail industry, in which total grocery turnover is around £125 billion per annum, a small but significant worsening of terms to even a very small proportion of customers could bring about very significant levels of consumer harm.<sup>13</sup> For example, a 5% increase in prices to just one in twenty grocery shoppers would represent an increase in total consumer grocery expenditure in excess of £300 million. Indeed, so substantial are the absolute sums spent on groceries that an argument could be made that a SSNIP should be defined for these purposes at a lower level than 5%.<sup>14</sup> In any event, it is clear that the CC should not be constrained in its ability to consider potentially significant restrictions and distortions of competition simply because a narrowly construed market definition test fails to identify such situations.

### 3.1.2 Market Definition or Competitive Assessment

Tesco has argued that the “ring-fencing” strategy used in the RBB Paper as the basis for market definition is relevant not to market definition, but only to subsequent competitive assessment.<sup>15</sup>

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<sup>12</sup> Paragraph 22, An assessment of geographic market definition in the UK groceries market, *op. cit.*

<sup>13</sup> Paragraph 30, Emerging Thinking, Competition Commission, January 2007.

<sup>14</sup> We note that the CC remains open minded on this question. Paragraph 17, Quantitative analysis working paper, *op. cit.*

<sup>15</sup> Paragraphs 22 *et seq.*, Annex A, Response to RBB Economics, *op. cit.*

We regard this as an entirely semantic issue. As noted above, the purpose of market definition is to identify a framework within which the features of the market may be sensibly assessed. The CC itself states that “in practice the analysis of market definition and the assessment of competition will overlap significantly”.<sup>16</sup> As such, market definition and competitive assessment should be seen as steps towards the ultimate objective of identifying the existence of market power sufficient to lead to a material restriction or distortion of competition.

In order to meet this objective, the real economic issue identified in the RBB Paper (i.e. the possibility of “ring-fencing” strategies) must be taken into account by the CC at some stage during its investigation. Whether it is taken into account in the market definition or competitive effects stages of the inquiry is inconsequential to the outcome of the analysis.

As such, it is not clear how the aims of the present investigation would be better served by the CC defining broad geographic markets under the pretence that there is no scope for targeted price increases, and then embarking on a separate analysis to explore this possibility. Under this approach, the market definition exercise would serve no useful analytical purpose and, as it is not an end in itself, would therefore be wholly redundant. The CC’s guidance is consistent with this view, and states that “market definition and competition assessment should not be viewed as two distinct chronological stages – rather they should be viewed as two overlapping analyses”.<sup>17</sup> Nevertheless, if such an inefficient two-stage process were to be undertaken, it would ultimately yield the same result as the market definition exercise described in the RBB Paper.

We therefore conclude that the argument that price flexing should be considered within competitive assessment rather than market definition stage of the inquiry is irrelevant to the manner in which the CC should conduct its investigation, and to the outcome of the analysis.

### 3.1.3 Regulatory Guidance and Academic Literature

#### *US Merger Guidelines*

The potential role of price discrimination in market definition has been explicitly considered by antitrust practitioners and academics, particularly in the US. The DoJ/FTC horizontal merger guidelines explicitly discuss the definition of product and geographic markets in the presence of price discrimination at sections 1.12 and 1.22, respectively.<sup>18</sup> This discussion supports the approach to market definition taken in the RBB Paper.

Section 1.22 of the US guidelines explains that a relevant geographic market may be defined as an area in which a SSNIP targeted at particular customers would be profitable, even where a general price increase across the entirety of that area would not be profitable. No reference is

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<sup>16</sup> Paragraph 1.22, Market investigation references: Competition Commission guidelines, *op. cit.*

<sup>17</sup> *Ibid.*

<sup>18</sup> Horizontal merger guidelines, US Department of Justice and the Federal Trade Commission, 1992.

made to that targeted price increase being sufficiently large as to offset the unchanged prices charged to those customers who are not targeted. The section goes on to explicitly identify the possibility of targeting “particular locations of buyers for which a hypothetical monopolist would profitably and separately impose at least a ‘small but significant and non-transitory’ increase in price”. We note that this sentence refers to the imposition of a SSNIP (i.e. the 5% price increase) only on those buyers in particular locations, and not as taking place over both the targeted and the non-targeted buyers.

*US Federal Trade Commission: Coate and Fischer*

In addition, a recent working paper by Coate and Fischer of the Federal Trade Commission discusses the use of price discrimination in market definition.<sup>19</sup> The authors argue that this approach is applicable to situations in which no clear gap exists in the chains of substitutes and in which substantial sales take place at the fringes of a market. These are exactly the characteristics of grocery markets in the UK. Indeed, Coate and Fischer use the example of a hypothetical monopolist of city centre and suburban grocery stores to illustrate the need to allow for the possibility of price discrimination. They note that a uniform SSNIP applied to both types of store in a particular city would be unlikely to be profitable due to the loss of sales from stores at the edge of the candidate market to stores just outside the boundary. They go on to state:

*“Thus, the SSNIP procedure would generate very broad markets, but the competitive realities could allow anticompetitive pricing at the core of the market. By considering price increases at some, but not all, of the store locations in the candidate market, the analysis can focus on a narrow market that may be at risk to non-competitive behaviour”.*

This example is precisely analogous to the task facing the CC in the current inquiry. Consequently, a failure to consider the targeting of a SSNIP at a sub-set of stores within a hypothesised market will risk missing precisely those situations identified as potentially problematic by Coate and Fischer.

*US Department of Justice: Gregory Werden*

A rigorous technical review of the practical application of the SSNIP test has been undertaken by Gregory Werden, senior economic counsel to the antitrust division of the US Department of Justice.<sup>20</sup> His paper discusses the use of a SSNIP algorithm to define markets in circumstances in which a hypothetical monopolist may set different prices to subsets of its customers. Professor Werden acknowledges the possibility that arbitrage between customers targeted by a SSNIP and those that are not targeted by it may limit the price increases that the hypothetical monopolist may be able impose, and explicitly allows for that constraint in his algorithm.

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<sup>19</sup> A practical guide to the hypothetical monopolist test for market definition, Coate and Fischer, Potomac Papers in Law and Economics, February 2007.

<sup>20</sup> Market delineation algorithms based on the hypothetical monopolist paradigm, Werden G.J., US Department of Justice mimeo, Economic Analysis Group Discussion Paper 02-8, 2002.

However, he does not make any reference to a requirement that the SSNIP imposed on any particular group be sufficiently high as to produce a particular average price increase across all customers. Professor Werden therefore implicitly recognises that control of a set of products, which confers the ability to exercise market power over a subset of customers, is sufficient to define a relevant antitrust market.

*US Department of Justice: Dennis Carlton*

Finally, in his submission on behalf of Tesco Professor Hausman cites two papers by Professor Dennis Carlton, chief economist at the antitrust division of the Department of Justice.<sup>21</sup> Contrary to the claim made by Professor Hausman it is not clear that Professor Carlton “posits that the [sic] at a minimum the average price should increase by 5%” as a universal requirement within the SSNIP test.<sup>22</sup> The papers that Professor Hausman cites make only passing reference to the ways in which a price increase across an entire market may manifest itself. The passages quoted appear to be intended by Professor Carlton merely as demonstrations of the ambiguities that can be raised in the application of the SSNIP test as generally formulated. That Professor Carlton does not explicitly discuss the special case of price discrimination permitting the “ring-fencing” of a subset of customers in a market cannot be construed as his rejecting the concept where appropriate.

Indeed, Professor Carlton concludes the paragraph from which Hausman draws his first quote with the advice that, where changes in the detailed form of the SSNIP test applied lead to differences in the conclusions drawn, it becomes vital to “delve more deeply into the underlying economics” of the industry in question. This use of an effects-based analysis in preference to the dogmatic application of a particular wording of the SSNIP test is precisely the approach taken by the RBB Paper.

### **3.2 Practical Objections**

Notwithstanding their views on the theoretical applicability of the “ring-fencing” strategy to geographic market definition, Tesco and Professor Hausman go on to argue that it would not be feasible for a grocery retailer to vary its price in order to exploit captive customers in situations of local dominance. Moreover, Tesco argues that the behaviour described in the RBB Paper is inconsistent with the observed facts of the industry, notably the absence of price flexing by Sainsbury's.

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<sup>21</sup> Market definition: use and abuse, Carlton D., US Department of Justice mimeo, 2007; Does antitrust need to be modernized?, Carlton D., US Department of Justice mimeo, Economic Analysis Group Discussion Paper 07-3, 2007.

<sup>22</sup> Paragraph 22, An assessment of geographic market definition in the UK groceries market, *op. cit.*

### 3.2.1 Identifying Infra-Marginal Consumers

Professor Hausman presents a theoretical model that demonstrates the difficulty faced by a firm seeking to implement price discrimination over consumers in the face of uncertainty over their willingness to pay.<sup>23</sup> This model is perfectly valid on its own merits, but has no relevance to the role of price discrimination in the definition of geographic markets in grocery retailing. Professor Hausman describes a situation in which a seller attempts to price discriminate but is unable to observe its customers' willingness to pay. RBB would agree that in such situations price discrimination is difficult to effect, although we note that the kind of information collected via loyalty card programmes may (as argued by Professor Dobson on behalf of the Association of Convenience Stores) provide some basis for such customer-level targeting of price.<sup>24</sup> However, such a model of discrimination is not, in any case, relevant to the type of price flexing suggested in the RBB Paper.

The "ring-fencing" strategy outlined in the RBB Paper provides a ready means for distinguishing between marginal and infra-marginal customers. Indeed, the very purpose of the strategy is for the hypothetical monopolist to retain marginal customers via control of the "buffer" stores to which such marginal customers would switch, while enjoying the benefits of exploiting the infra-marginal customers who choose to remain at the central store despite the price increase. The customers thus self-select themselves into marginal and infra-marginal by their choice of store following the SSNIP. There is thus no need for the hypothetical monopolist to identify customers' type, nor to find a means of charging a different price to different consumers at a particular store.

Interestingly, the situation Professor Hausman describes would be relevant to the INM/Archant case that Tesco initially cited in support of its position that price flexing should not be incorporated into market definition.<sup>25</sup> As stated in the RBB Paper, market definition in that case considered the possibility of a hypothetical newspaper monopolist segregating advertisers based on their (unobserved) willingness to pay for advertising.<sup>26</sup> As Tesco notes in its most recent submission, we agree that the facts of the newspaper industry would make such discrimination based on unobserved characteristics extremely difficult.<sup>27</sup> However, the fact that the CC concluded that the identification of price insensitive newspaper advertisers is difficult does not imply that price discrimination in the present case is "at odds with previous CC practice" and inapplicable in general.<sup>28</sup> On the contrary, the approach in INM/Archant indicates that it is indeed CC policy to consider the possibility of price discrimination in the market definition stage of its inquiries.

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<sup>23</sup> Paragraphs 29 *et seq.*, An assessment of geographic market definition in the UK groceries market, *op. cit.*

<sup>24</sup> Micro-marketing and discriminatory practices in UK grocery retailing, Professor Dobson, December 2006.

<sup>25</sup> Paragraph 27, Annex A, Geographic market definition in the groceries inquiry, Tesco, undated.

<sup>26</sup> Section 3.2.1, Geographic market definition in grocery retail, *op. cit.*

<sup>27</sup> Paragraph 49, Response to RBB Economics, *op. cit.*

<sup>28</sup> Paragraph 50, *ibid.*

### 3.2.2 Inconsistency with Observed Behaviour

Finally, Tesco argues that one needs to consider price discrimination in the context of the industry and points out that a price-flexing strategy is inconsistent with Sainsbury's own current conduct.<sup>29</sup> It is true that Sainsbury's does not currently engage in price flexing, but this does not mean that such a possibility should be disregarded in market definition.

First, the SSNIP test concerns the behaviour of a hypothetical monopolist, and must allow the scope of its behaviour to differ from the observed behaviour of non-monopolists. Market definition is intended to provide a framework within which to identify the risks associated with the behaviours that a firm may adopt in the event of achieving dominance within a relevant market. While it is necessary to ensure that the behaviour ascribed to the hypothetical monopolist is technically and commercially feasible, that behaviour need not currently be observed within the industry.

Price flexing is clearly a technically feasible strategy for grocery retailers, and one that could be commercially attractive. During its 2000 investigation, the CC identified the scope that existed for grocery retailers to vary list prices across their estates.<sup>30</sup> Moreover, we understand that a number of national chains, including Somerfield and the Co-operative Group, continue to do so today. There is therefore no technical barrier preventing a retailer from varying price and its incentive to do so will likely increase with the proportion of its estate that lies in areas of high local concentration.<sup>31</sup>

Second, if market definition varied according to the current strategies employed by retailers, the scope of the market in which particular stores operate would vary depending upon their identity. For instance, a store operated by Somerfield, which does flex prices, may be found to operate in a relatively narrow geographic market due to the possibility of "ring-fencing", whilst the same store to be operated by Asda, which does not currently flex shelf prices, would be held to lie in a broader geographic market. If geographic markets are to provide a meaningful indication of the distances over which stores potentially exert a competitive constraint upon one another, those markets must be defined independently of the particular commercial strategies deployed by their operators.

Finally, price is not the only mechanism by which a hypothetical monopolist may profitably exploit a group of captive consumers. For ease of explanation the SSNIP test is usually framed in terms of a price increase, on the assumption that all other aspects of firms' offers remain constant. However, it is clear that for the purposes of identifying the potential for market power to result from market concentration, competition regulators should consider the scope for firms facing limited competition to exploit their position via other aspects of their offer. The CC considered this possibility in some depth during the recent HMV/Ottakar's merger, investigating

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<sup>29</sup> Paragraph 2.16, Response to RBB Economics, *op. cit.*

<sup>30</sup> Paragraphs 2.394 *et seq.*, Supermarkets: A report on the supply of groceries from multiple stores in the United Kingdom, Competition Commission, October 2000.

<sup>31</sup> See section D, Response to issues raised, Sainsbury's, December 2006.

whether book sellers operating national price lists may vary their breadth of range and quality of service in response to local competitive conditions.<sup>32</sup>

The same principle is applicable to the grocery retail industry. A grocery retailer with a dominant local position may choose to profitably exploit customers' lack of choice through a worsening of quality, range and service, even if it were to maintain a single schedule of shelf prices. Indeed, the margin-concentration analysis undertaken by the CC appears to have found empirical evidence of grocery retailers varying their overall offer in response to the degree of local competition faced.<sup>33</sup> The absence of explicit shelf price flexing by some grocery retailers does not therefore exclude the possibility of an adverse effect on competition in areas of high local market share through other means.

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<sup>32</sup> Paragraphs 5.35 *et seq.*, Proposed acquisition of Ottakar's plc by HMV Group plc through Waterstone's Booksellers Ltd, Competition Commission, May 2006.

<sup>33</sup> See Annex A, Working paper on market definition, Competition Commission, May 2007.

## Annex: Empirical Impact of Price Flexing

As discussed at section 2 of this paper, we have constructed a quantitative SSNIP model similar to Tesco's in order to investigate the sensitivity of such a model to the introduction of price flexing. This analysis has found that permitting a hypothetical monopolist to engage in a "ring-fencing" pricing strategy changes the results materially.

This replica has been constructed on the basis of the methodological and factual assumptions set out in Tesco's explanation of its model. This approach should not be construed as representing support for these assumptions, however; a review of Department for Transport guidance has indicated, for instance, a travel cost for non-work car journeys at least double the transport cost assumed by Tesco.<sup>34</sup> We have adopted Tesco's assumptions solely in order to demonstrate the effect of price flexing within its model.

Our analysis focuses on 26 Tesco stores, chosen to give a reasonable mix of urban and rural locations.<sup>35</sup> In each of these cases our replica of the Tesco model indicates that the uniform 5% SSNIP test used by Tesco would imply markets with drive times in excess of 30 minutes, as Tesco originally reported for 87% of its stores.<sup>36</sup> Indeed, in 19 of the 26 cases we have considered, the implied market radius without price flexing is in excess of 45 minutes.

We implement a SSNIP test with price flexing by checking whether the chosen Tesco (centre) store by itself passes the SSNIP test and therefore constitutes a market. If not, then the next closest substitute store (defined by its diversion ratio from the centre store) is brought under the hypothetical monopolist's control, and the profitability of a 5% price increase at the centre store re-evaluated. This process is repeated until the SSNIP test is passed.

Before presenting our results, it is important to note three methodological differences between our analysis and that undertaken by the CC using a modification of Tesco's model.<sup>37</sup>

### *Individual store pricing by a hypothetical monopolist*

First, and as noted at section 3.1 of this paper, the CC has taken a conservative approach in its relaxation of the price uniformity assumption, and required that the average price increase imposed by the hypothetical monopolist across the candidate market equal 5%. The main purpose of this paper has been to refute Tesco's argument that this is a necessary condition for

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<sup>34</sup> Values of time and operating cost, Transport analysis guidance, DfT, February 2007

<sup>35</sup> The stores are (store references in brackets): Great Dunmow (5084), Brixton (1864), Hornchurch (2094), Liverpool (8762), Neasden (874), Southend (5604), Walsall (350), Leeds (7788), Bedford (4440), Oxford (5520), Bedworth (2314), Aylesbury (4602), Mickleover (3011), Milton Keynes (4555), Weston Super Mare (318), Cardiff (7972), Greenock (4399), Chester (7973), Burgess Hill (4932), Kings Lynn (3026), Hexham (13566), Chard (7773), Cirencester (4751), Burscough (13551), Newton Aycliffe (9214), and Maidstone (5882).

<sup>36</sup> Paragraph 6, Annex A, Geographic market definition in the groceries inquiry, *op. cit.*

<sup>37</sup> Paragraphs 22 *et seq.*, Quantitative analysis working paper, *op. cit.*

the application of the SSNIP test, and as such in our quantitative model we require only that a 5% price increase take place at the centre store. This will have the effect of narrowing the markets implied by our model relative to both the uniform SSNIP approach employed by Tesco and, to a lesser extent, the average SSNIP approach taken by the CC.

#### *Candidate market selection algorithm*

Second, the algorithm we have used to identify substitute stores differs from that used by the CC. Our approach focuses on the particular 26 Tesco stores on which the analysis is centred, and requires that these stores impose the 5% SSNIP; additional “buffer” stores are then added until the SSNIP at that central store is rendered profitable for the hypothetical monopolist. The CC’s approach instead searches for relevant markets in which the 20 Tesco stores that it has chosen may lie, irrespective of whether a price increase actually takes place at those stores. This less restrictive approach allows the candidate market to iterate more rapidly towards a set of stores that can be profitably monopolised than the conservative approach adopted in our modelling. This difference in the modelling approach will therefore bias our sensitivity tests towards wider markets than the CC’s analysis.

#### *Heterogeneity of consumer preferences*

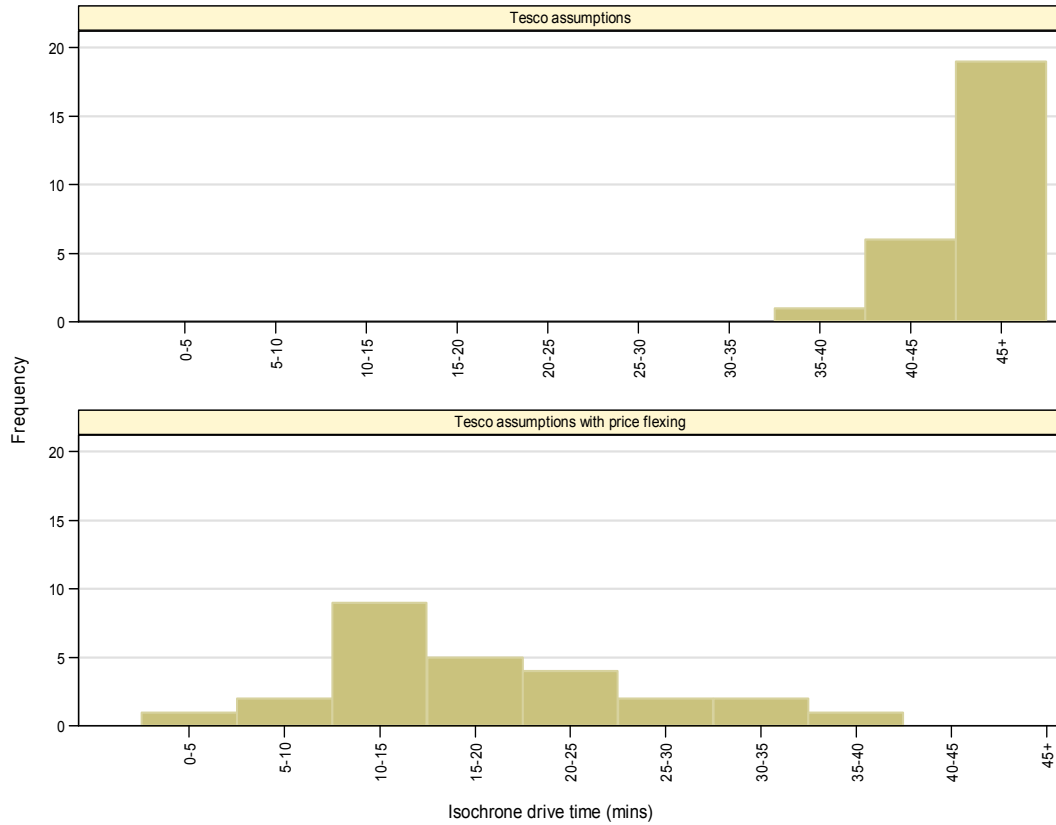
Third, we have not sought to replace Tesco’s assumption of homogenous consumer preferences with a more realistic assumption that some consumers are less likely to switch than others in response to a SSNIP. The CC has investigated this issue by adopting Tesco’s suggested assumption that 30% of each store’s turnover is accounted for by loyal customers who would not switch in the event of a SSNIP, finding that this is sufficient to reduce the size of implied geographic markets in a number of instances. This aspect of the Tesco model represents a further area in which there could be significant scope for disagreement, and the 30% figure suggested by Tesco and adopted by the CC is largely arbitrary; nonetheless, it is clear that some heterogeneity of customer preferences would better represent the realities of the grocery industry than the homogenous population assumed by Tesco. Therefore, while we do not attempt to incorporate consumer heterogeneity into our analysis of the quantitative model, we do note that doing so would tend to reduce the size of the implied geographic markets found.

Figure 1 summarises the results of our sensitivity analysis. The top frame indicates that under Tesco’s model, with uniform pricing, all 26 of the stores we have analysed would appear to lie in markets at least 35 minutes’ drive time in radius. Indeed, in the majority of cases, Tesco’s assumptions imply markets of more than 45 minutes’ radius, although we have not extended our analysis beyond this range. Making the conservative assumption of a 45-minute drive time in these cases, Tesco’s assumptions imply an average drive time for the 26 sites of 44 minutes.

The bottom frame relaxes Tesco’s price uniformity assumption. This reduces the 44 minutes’ (minimum) average drive time implied by Tesco’s model by at least 60%, to less than 18 minutes. Modifying this single assumption thus produces a completely different distribution of results to that claimed by Tesco.

Figure 1

**Distribution of drive times implied by replica of Tesco SSNIP model**



These illustrative results indicate the sensitivity of the Tesco model and the results claimed by Tesco to changes in just one of the underlying assumptions. We see that replacing just one of Tesco's assumptions with a reasonable and plausible alternative reduces the implied average travel time within our sample by 60%, indicating the dangers of using Tesco's model for geographic market definition.