

QUANTITATIVE ANALYSIS WORKING PAPER (2) (SUBMITTED SEPT 07)

Market definition – making use of real world data

1. INTRODUCTION

1.1 Whilst the Quantitative Analysis Working Paper (QAWP) looks at market definition from both the perspective of a formal SSNIP model and the CCs margin-concentration analysis, the Retail Competition Working Paper (RCWP) appears to ignore SSNIP models altogether, and simply claims that:

“... in order to capture the geographic scope of the relevant markets, we have identified in our analysis to date local competitive constraints shown by 10-15 minutes isochrones around a store.”¹

1.2 Thus, the analysis in the RCWP, and in the Land Holdings Working Paper, is all predicated on two assumptions:

- (a) that local markets are the same size everywhere; and,
- (b) that these local markets are only 10-15 minutes in size.

1.3 Both of these assumptions are at odds with the real world and cannot provide the CC with a robust approach to looking at the UK grocery market.

1.4 We have previously submitted, and continue to submit, substantial empirical evidence on both the CC’s margin-concentration regressions, and on a suggested approach to applying SSNIP directly. In this paper, we adopt a different approach and one that appears to be acceptable to both the CC and RBB:

“The use of the SSNIP framework is therefore in providing a coherent structure within which numerous pieces of evidence may be considered and weighed.”²

1.5 Specifically, we use the SSNIP framework to set out the logical constraints that need to be considered when assessing any relevant retail geographic market, namely the degree to which customers can switch to outside the isochrone because:

- (a) they live outside the isochrone;
- (b) they live close to the edge of an isochrone that has rivals just outside.

1.6 We believe that the view that these are logical things to consider is incontestable. The issue is therefore one of degree. Common sense suggests that if

¹ See paragraph 40 of RCWP. The CC later acknowledges that, if it “our view on the scope of the geographic market changes as a result of our consideration of these arguments, then this will be taken into account in our consideration of retail competition.” (See paragraph 41.)

² See page 2 of *Geographic market definition: a response to Tesco and Professor Hausman*, RBB, 7 August 2007.

the average customer travels 10 minutes, many customers must travel further than this; that there must be many customers close to the edge of any particular isochrone who could readily switch away; and that there must be many stores just outside the edge of any particular isochrone that provide realistic switching options for those customers. In this paper we provide empirical evidence on all these matters which shows that while the extent of these factors varies across stores, the impact of this switching is often likely to be large. [1] of Tesco stores above 1,400 sq m have more than enough trade from outside 10 minutes to invalidate a 10 minute market. Around 60% of Tesco stores have more than 75% of the customers in a 10 minute isochrone within 5 minutes of the edge. 50% of Tesco stores have more than 6 stores above 280 sq m. just outside the edge of the isochrone.

1.7 These simple empirical facts demonstrate that, even if the CC is to use SSNIP only as a guiding framework rather than an explicit test, it must be the case that (i) all local markets must be different in size; and (ii) 10-15 is clearly too small an area for very many catchments.

1.8 The data we present is real trade data, real shopping patterns and real store locations. Nothing is simulated or estimated.

2. REAL TRADE DISTRIBUTIONS SHOW THAT MANY CUSTOMERS COME FROM OUTSIDE 10 MINUTES

2.1 The analysis in the RCWP is based on stores operating in markets which are exactly the same size and are 10 or 15 minutes wide.³ This approach cannot be correct. It ignores constraints from stores outside the isochrone, or assumes that these are insufficient to constrain the hypothetical monopolist of the 10 or 15 minute market. But given the trade distributions of stores, and the fact that catchments overlap, it is necessary to test this assumption. We use Tesco real world data on shopping patterns to investigate this approach.

2.2 First, as Professor Hausman observed⁴, it is necessary to look at the real world trade distribution of the centre store to identify the proportion of customers that come from outside the isochrone. Using Tesco's definition of variable margin, only around [1] of revenues are required to make a SSNIP unprofitable. So if all customers outside the isochrone were assumed to switch away, and this was the only type of switching that occurred – ignoring the possibility that customers inside the isochrone might switch away – this effect on its own is enough to mean that a 10 minute isochrone is incorrect in the majority of cases.⁵

(a) [1] of stores above 1,400 sq. m have more than the [1] threshold of their real world trade outside 10 minutes (using Clubcard data on actual trade patterns), so 10 minutes cannot be the correct isochrone for these stores;

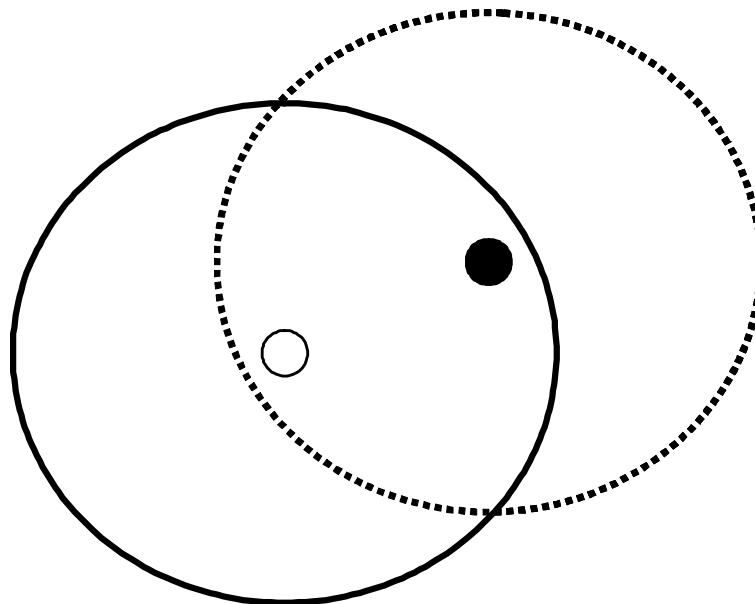
³ The analysis of choice in the retail competition working paper and all the analysis in the Land Holdings paper is based on equal-sized isochrones without reference to whether these are markets appropriately defined.

⁴ Professor Hausman, Expert Report, paragraphs 7 to 18.

⁵ | .

- (b) [] of stores above 1,400 sq. m have more than the [] threshold of their trade outside 15 minutes, so 15 minutes cannot be the correct isochrone for these stores.

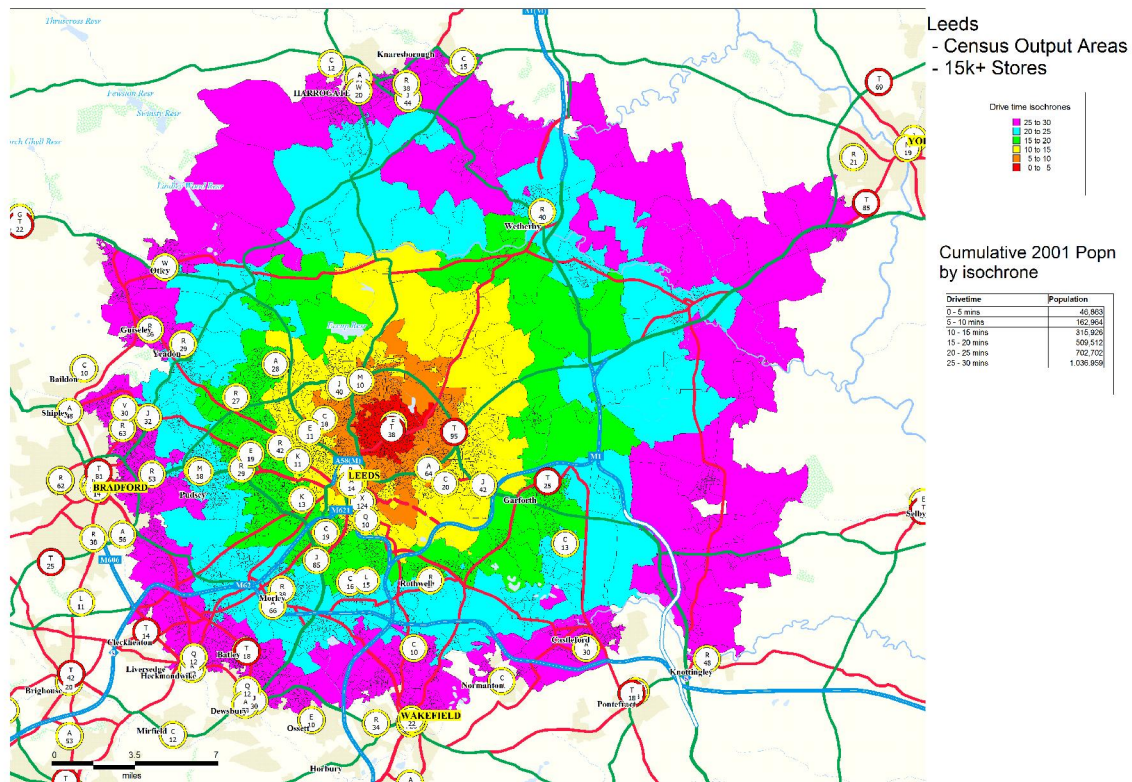
2.3 This data alone invalidates the CC's apparent approach to market definition in the RCWP. But this is an underestimate of the proportion of trade that comes from outside 10 minutes for the stores of the hypothetical monopolist. The figures above look only at the trade distribution of the store at the centre of the isochrone. Other stores in the local area will be closer to the edge of the market – and so a proportionately larger amount of their trade will come from outside the 10 minute market.⁶ This is illustrated in the figure below. The red circle is the centre store, which faces one competitor in the isochrone (the black circle). The trade distribution for the rival is mostly outside the 10 minute isochrone around the centre store (shown by the shaded area) – even ignoring the fact that much of the rival's trade is likely to come from further than 10 minutes away.⁷



2.4 As a real example of this issue, consider a 10 minute isochrone around Tesco's Leeds store. This is shown in the Figure below.

⁶ It is not clear what price increases the CC implicitly considers to apply in the “all 10 minute” approach contained in the RCWP. We assume here that the CC is assuming a uniform price increase across all stores. If not, the CC will have to identify exactly what prices are charged by individual stores in each local market. To the extent that there is a price increase assumed at any store outside the centre store (which is the case for all of the stores explored by the CC in the QAWP) this point will continue to hold.

⁷ Including this extra trade only strengthens the point.



2.5 Within the isochrone, but 9-10 minutes away, are an Asda, a JS, a Morrison, and a Co-op. There is also another Tesco (Seacroft) which is 9 minutes away. [1] of the Leeds store's trade comes from outside its 10 minute isochrone (enough on its own to invalidate the finding of a 10 minute market). For Seacroft, [1] of its trade comes from outside the 10 minute isochrone around the Leeds store. If a similar pattern was true for the other stores in the isochrone – which are similarly close to the edge of the isochrone – over [1] of the trade of stores within the isochrone would come from outside the isochrone. This further suggests that 10 minutes is substantially too narrow for both Leeds and Leeds Seacroft – and by extension, for many other stores – simply through observing their trade distribution patterns.

3. CUSTOMERS INSIDE THE ISOCHRONE MIGHT SWITCH OUTSIDE

3.1 The analysis thus far has ignored the possibility that any customers inside the isochrone might switch to stores outside the isochrone. This is not a reasonable assumption, for two reasons.

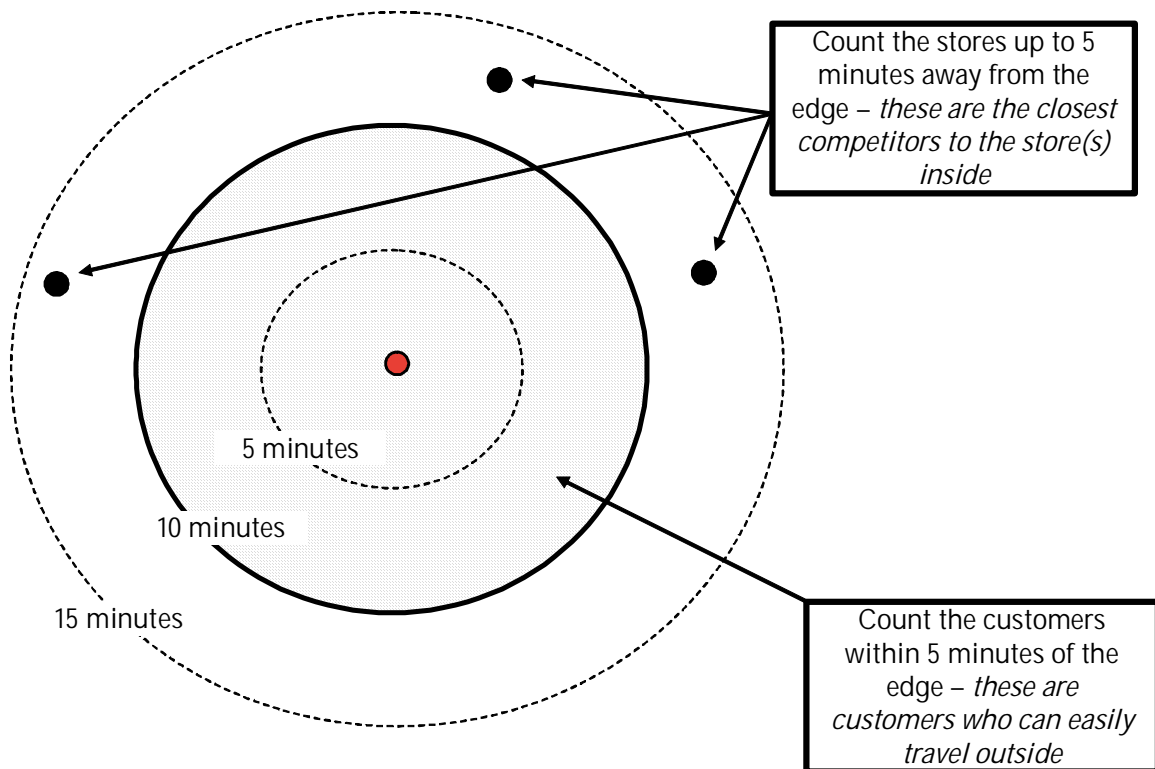
- (a) **Many customers live close to the edge of the isochrone.** If customers were distributed equally throughout the isochrone, which seems a sensible starting point, 75% of customers in a 10-minute isochrone would be within 5 minutes of the edge of the isochrone – in other words, they are closer to the edge of the isochrone than the centre of the isochrone.⁸ In a 15 minute isochrone, again assuming a constant customer density, 55% of customers are within 5 minutes

⁸ This is the direct corollary of the fact that a 10 minute isochrone is on average four times the size of a 5 minute isochrone (from the fact that the area of a circle is πr^2).

of the edge of the isochrone.⁹ This point was made by Professor Hausman in his Expert Opinion (paragraph 46).

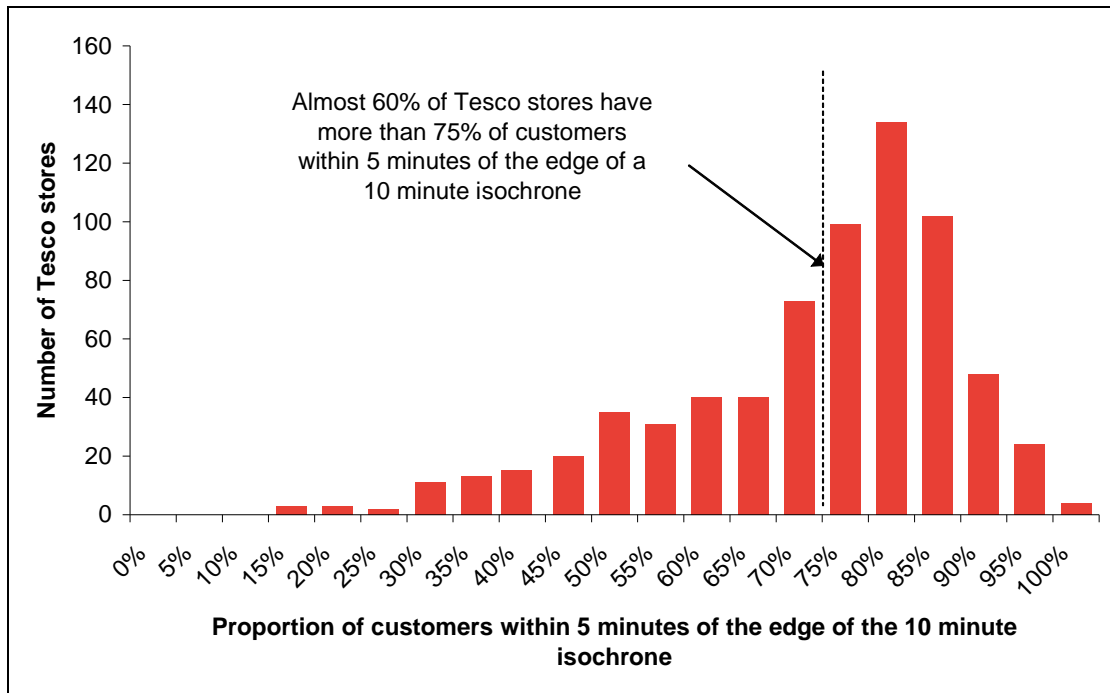
- (b) **Many customers are in the catchments of stores outside the isochrone.** If customers travel on average 10 minutes, then any store within 10 minutes of the edge of the isochrone has a catchment that overlaps to some extent with the 10 minute isochrone around the initial store. These stores between 10 and 20 minutes away must therefore be a constraint on the behaviour of stores within the isochrone. These constraints cannot be ignored.

3.2 To illustrate the materiality of these points, we count (conservatively) customers within 5 minutes of (and inside) the edge of the 10 minute isochrone around each Tesco store, and (conservatively) stores within 5 minutes of (and outside) the edge of the 10 minute isochrone. This should not be taken as suggesting that we think that these are the only customers or stores that are relevant; it simply illustrates the key point. This approach is illustrated by the Figure below.

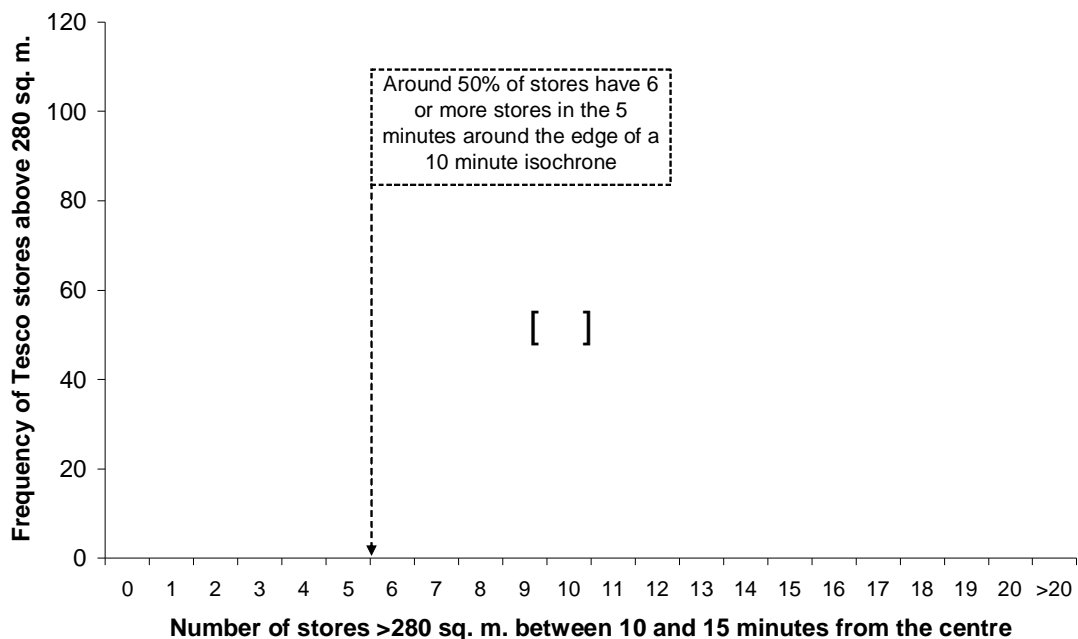


3.3 It is possible to explore the extent of these constraints using the actual locations of customers and stores. There are often many customers close to the edge of the isochrone (but inside the market) – 59% of Tesco stores have 75% or more of the customers within 5 minutes of the edge of a 10 minute isochrone. This is shown in the Figure below.

⁹ This is because a 15 minute isochrone is on average 2.25 times wider than a 10 minute isochrone (again from the fact that the area of a circle is πr^2).



3.4 Equally, there are often many stores close to the edge of the isochrone (but outside the market) – around half of Tesco stores have 6 or more stores within 5 minutes of the edge of a 10 minute isochrone. This is shown by the Figure below.



3.5 If there are both a) many customers close to the edge of the isochrone and b) many stores just outside the isochrone, it is highly likely that the market is wider than 10 minutes. These two dimensions are shown in the Figure below. We divide (arbitrarily) the picture into categories where a) more than 30% of customers live within 5 minutes of the edge of the market and b) there are 3 or more stores within 5

minutes of the edge of the market (i.e. between 10 and 15 minutes). It can be seen that the vast majority of stores fall into this category.¹⁰



3.6 It is interesting to note that in some cases there are more than 80% of customers within 5 minutes of the edge of the market and more than 25 stores within 5 minutes of the edge of the market. The CC's current approach completely ignores the constraints that these stores and customers place on stores within the market. This is an untenable position. It is not possible for the CC to conclude on market definition without taking these common-sense features of the market into account.

3.7 Second, on any analysis, the market size must differ from area to area. This is shown by:

- our SSNIP model, which describes a market in each area which is different;
- the CC's modifications of our SSNIP model, which describes a market in each area which is different;
- Professor Hausman's approach, which shows that the trade distribution around every store is different;
- RBB's SSNIP model;
- the SSNIP interpretation of the CC's margin-concentration analysis;
- our common sense approach above, which shows that:

¹⁰ These thresholds are illustrative and do not reflect a view that less than three stores and/or less than 30% of customers, would be insufficient to constrain the hypothetical monopolist – this simply shows that there are large numbers of stores with a) lots of locationally marginal customers and b) lots of alternative switching options.

- the trade distribution around the central store differs from area to area;
- the trade distribution around other stores in the putative market varies from area to area;
- the number of customers close to the edge of the market varies from area to area; and
- the number of stores just outside the market varies from area to area.

4. CONCLUSION

4.1 There is no support for the geographic market being the same in every area, and since the CC has or can acquire the data for each area, it is insufficient to explore only a “representative sample”. If the CC is going to find individual local markets, it must define the market in each area according to the characteristics of stores and customers in that location.

4.2 As we have shown above, it cannot be right for the CC to conclude that markets are 10 or 15 minutes in each location. This ignores a) the fact that many customers already travel further than this distance and b) that there are many customers and stores close to the edges of any isochrone so switching outside the isochrone must take place.

4.3 Any subsequent analysis must be based on properly defined markets, not on arbitrary isochrone boundaries that are the same in every location. The approach above captures the essential intuition, using real world data, behind this conclusion.