MARKET STRUCTURE AND ENTRY: WHERE'S THE BEEF?

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DATA APPENDIX

Selecting the sample

1. We chose the *unit of observation* to be the Local Authority District, that is a physical place. This is the smallest unit of local government in the UK, and generally consists of a city, or a town with some hinterland, or a largely rural area. Clearly they are contiguous, in general, so there is no separation. We have to examine the question of whether they correspond to distinct markets (to a statistical approximation) econometrically. The advantage of using Districts is that matching statistical data at the same level of aggregation is mostly easily available. The next division up, the County, is clearly too broad for our purposes, in the sense that by no means all outlets in a County could be considered to be in competition. Some information is available at a finer level of classification, the Census Enumeration district. Our judgement is that these are generally too small to be considered as markets. There is also a tradeoff to consider. We wish to examine entry. A non-negligible proportion (>10%) of Districts are entered by one or both players in each year. The same would clearly not be true for finer classifications.

2. Our chosen *framework of explanation* involves characteristics of the District and the District in relation to other districts and the base of the chain. Hence our sample selection must bear this factor in mind. This leads to us using only Great Britain (i.e. not Northern Ireland) as the basis of the sample. Northern Ireland is separated by a significant body of water from Great Britain and also over the sample period we would expect was significantly affected so far as investment is concerned by "the Troubles". Geographically, we also drop all island-based districts except the Isle of Wight. It also leads us to reject from our sample dedicated transport-based outlets (i.e. principally, motorway outlets which can be visited only

from the motorway, restaurants in airport terminals, and some railway station outlets). Finally, we drop the three London Boroughs (Districts) which are least representative of their own population and most representative of the areas visited by tourists, namely the City of London, Westminster, and Kensington and Chelsea. The City of London is also, of course, a District which has very little of its own population but a huge influx of office workers during the day. One advantage of Districts is that they generally encompass both a business district and the residential areas from which the workers are drawn.

Data matching notes: Burger King and McDonalds

1. McDonalds opening date data were obtained direct from the company's UK head office. They are correct up to November 1995, but include imminent openings as well as currently opened stores. They include information on store location (address) including postcode and telephone number, store type (wholly owned, franchised (called licensed), drive through facility or not), exact opening date, and store number. On ranking by number it is apparent that this corresponds almost exactly to opening date data- any discrepancies can be attributed to slight differential delays in opening Following from this and the fact that only a very small number of store numbers are missing, we may also infer that very few stores indeed ever close (perhaps 1% of the 1995 stock). Thus the numbering system provides a very useful checking function and correction of any mis-keying. The postcode information is however not accurate, it contains some obvious errors as well as some incomplete and "guessed" postcode endings. The first McDonalds store in the UK opened in 1974.

2. Burger King head office supplied us with a complete listing of stores open as at end-November 1995. This is a listing including address, telephone number and store type (managed or franchised). However they claimed not to know opening dates of their stores.

They also have a numbering system for their stores, but it is much more opaque (it appears broadly chronological, but perhaps is a world-wide number system, since the numbers are implausibly large for the UK alone, and there is no simple code). The history of the company is also more complex. Whilst McD has grown entirely organically, BK has involved some growth by acquisition (see main text). There is also some evidence that stores have moved between managed and franchised status, probably in both directions. Again, the postcode information supplied contains some obvious errors, of the same type as in the McDonalds data (despite the fact that it is used as a mailing list).

3. Faced with this problem of obtaining BK opening dates, we adopted the following strategy. With BK's agreement, we wrote to all stores/ owners to ask for opening dates of their outlets as month/year, including a form and a stamped addressed envelope. As a result of the chain's history, we allowed answers such as "before 1990"- many stores were converted from a "Wimpy" format, for example. We followed this mailing up with telephone calls, and if requested, faxed copies of the letter and form. Nevertheless, the response was poor, with a total coverage of less than 50% of stores.

4. The next tack was to consult old copies of Yellow Pages at the BT archive in London, to ascertain first dates of listing. Simple one-line entry listing in Yellow Pages is free, and we know all outlets have a telephone number, so we would expect near to 100% coverage in Yellow Pages. A complete search of the item Burger King under the "Restaurants" heading in Britain's Yellow Pages for the years 1990, then 1991/92 to 1995/96 inclusive was undertaken, i.e.. 6 directory years. (The alternative, consulting the White Pages, was used only as a confirmatory device, because they are not issued as frequently as Yellow Pages, only at roughly 18 monthly intervals). The start and end dates were dictated by our research

period, based on BK history and the market situation, as outlined in the paper. Our assumption is that there is a short lag between opening and listing, but that first listing in the 1992/93 issue implies an opening date in 1992. Checks against the returned responses from the survey exercise indicated that this was a reasonable presumption. Where we had a firm (month, year of opening) response from an outlet, this was treated as the definitive date.

5. Several issues arise from the Yellow Pages (YP) search. First, there were occasional missing directories or missing observations- usually, these can be resolved because observations are available for neighbouring years or through using White Pages. Observations repeated in two directories are no problem. But a small number of outlets we know exist in 1995 (approx. 11) could not be traced in Yellow Pages. There are three main reasons: (i) For historical reasons, the city of (Kingston upon) Hull had and has a different telephone system and its listing policy may differ- outlets in Hull are not listed in the YP system, (ii) outlets in YP directories with very broad geographical coverage missed some entries for places at a considerable distance from the major town, (iii) (most importantly) the London directories missed some observations for an unexplained reason. Lastly, it is apparent that BK's rate at which outlets fail or are otherwise dropped is somewhat larger than McD's very low figure, although still in the region of less than 5% over the entire sampling period.

6. The next stage in the process was to match outlets to Local Authority Districts, our chosen level of observation. We did this using the "Postzon" file system available on "Midas" through the ESRC (with permission). This is the recognised standard method of matching postcodes to geographical areas in the UK. It provides a complete mapping of postcodes to local authority districts based upon the 1991 Census. Unfortunately it needs completely

accurate 6/7 digit postcodes in order to produce output. This required us to correct all "guessed" postcodes in the BK and McD files, in addition to the obviously erroneous cases. (To illustrate, a postcode might be entered as CV1 1XX. All CV1 outlets are in Coventry district, a fortiori all CV1 1.. outlets, but when the original record guesses the last letters, and these are invalid, the Postzon system will not run.) Thus, problematic cases emerging after a first run were checked against the Royal Mail Postal Address directories for the UK, either for the BK/McD outlets themselves, or in the case of decease or non-appearance in that volume, the postal address of the outlet. This still left a very small proportion of outlets which produced no result. The reason for this appears to be that Postcodes occasionally change (for instance, in districts which experience rapid growth, new subdivisions are created). Since Postzon uses 1991 postcodes but the Postal Address books use the latest postcode, the problem was solved mechanically. In such cases, a visual comparison between physical maps of postcode areas (Bartholomew's *Postcode Atlas of Great Britain*) and maps of Local Authority Districts (kindly supplied by the Office for National Statistics, Fareham) was made in order to locate remaining outlets to districts. This involved approx. 20 observations in the main sample.

7. At this stage, we have a mapping of districts for 1990 or earlier- 1995, with in each case the number of BK and McD outlets existing in each year. This is then matched with district data for 1991-5 inclusive obtained largely from Regional Trends.

Other Variables

1. Most of the information regarding the characteristics of the districts comes from *Regional Trends* in the section concerning the Local Authority District level of aggregation. There are almost 500 Districts in our sample. In England, the definition of these districts has remained

unchanged over the period 1991-1995 of our sample. In Scotland and in Wales, a reorganisation took place from 1995, and no splicing data were produced, which means that there is not a complete sample for 1995. Our principle, in matching data for 1995 with earlier years, is to accept a match only if the name of the district remains essentially unchanged *and* the land area changes by less than 1%. Otherwise the 1995 observation is dropped. Most of the main areas of population in Scotland remain in the sample, but the Welsh sample is significantly affected.

2. Regional Trends yields the following variables at District level for each year [most common table number listed]: (table 15.1): **Area** (thousand sq. km.), **Population** (thousands), **Percentage of population aged 5-15**, **Percentage pension age or over**; (table 15.2): **Local authority tenants average weekly un-rebated rent per dwelling** in £, **Council tax** in £, both at April; (table 15.3)- this is related to average domestic property size: **Claimant unemployed** in thousands, January (figures culled instead from the source of the Regional Trends figures, the *Employment Gazette,* where missing from Regional Trends), **Gross value added in manufacturing** £m (also an incomplete series, but with no obvious means to complete it). It also yields the following variables at sub-Regional level: **Average wages/salaries in manufacturing**, £000p.a. (table 14.3), GDP, £ per head, with UK=100 (for 1991 only). These regional figures were used at district level.

3. **Distances in miles and times in minutes from the relevant offices** of the companies concerned (Burger King's marketing department at Uxbridge and McDonald's headquarters at Finchley) to the District were calculated as follows. The location of the District was assumed to be at the named place in the case of a district based on a particular name (e.g. Coventry, in the case of Coventry district). However, for many districts, for reasons best known to their creators, the district was not given the obvious name but rather some "historical" name which does not correspond to a name on the map. Thus for example, the

district based on Loughborough is called Charnwood. To deal with these cases, the location of the main council offices (ascertained from the telephone directory) was taken to be the place. Mileage and time were then calculated to his place using the Automobile Association product "A to B" which is a commercial software product designed to help people plan their journeys. It is apparent that the timings do not make significant allowance for congestion, but the mileages are based on realistic routings.

4. The **adjacent districts** to the district in question were evaluated as follows: Using the mapping of districts produced by the Office for National Statistics, the set was (each district connected continuously by more than a point to the district in question). In the case that the adjacent district was across a stretch of water, the criterion employed was that at least one non-toll bridge/tunnel connecting the districts was required for the districts to be considered adjacent. Thus for example, Gateshead and Newcastle are adjacent, North and South Shields are not, by this definition. These data were used to construct the NBOBO variables.

5. All other variables are derivative of these.