



Empirical indicators for market investigations

Summary and conclusions

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1 SUMMARY AND CONCLUSIONS

Introduction

- 1.1 This project was commissioned by the OFT and DTI from NERA. The goal of the project was to 'generate an empirical tool which can be applied in a top-down way such that available and relevant data across all markets or sectors can be screened for problem markets.' The definition of 'problem market' was not confined to markets in which there was a lack of effective competition but encompassed any market where there was a consumer detriment, including for example markets where complaints suggested that consumer protection was inadequate.
- 1.2 The project specification required that we:
- Identify indicators which could be used to identify markets that are not working well for consumers (such as high profitability). In doing this we were asked to draw on the theory and examples in the OFT's Research Brief¹
 - Search for relevant sources of data which could be used directly or as proxies for the selected indicators
 - Develop a suitable methodology to make best use of the available data. The methodology was to take advantage of all the available indicators and proxies, and adopt a top-down approach so that it could be used to identify problem areas from a large number of markets
 - Apply the tool to identify five to ten markets.

¹ The Research Brief identified the following 17 'indicators': entry barriers, market share, concentration indices, concentration ratios, price behaviour, switching costs, search costs, dispersion of prices, focal competition, bundling/aftermarkets, commission payments, complex products, infrequent purchases/credence goods, profitability, productivity, growth, consumer complaints.

- 1.3 This report provides a concise summary of the results of the project, focussing in particular on the question of how the indicators should be combined.
- 1.4 There are a number of severe limitations with a top-down approach which attempts to identify potentially problematic sectors based on cross-industry databases. The most important of these are described below. Because of these limitations, a traditional case-by-case or 'bottom up' approach to searching for problematic markets is essential as a complement to, or possibly even substitute for, the top-down approach.
- 1.5 Three points about the scope of the project should be noted:
- First, the top-down methodology is designed to assist the OFT in identifying sectors that are more likely than others to have either competition or consumer problems. For both theoretical and practical reasons, it cannot achieve more than this. Where a sector is identified by the methodology this does not imply that the market is in fact failing consumers. Similarly, where a sector is not identified by the methodology, this does not imply that the market is serving consumers well. Either of these conclusions could only be reached on the basis of much more detailed investigation of the sector in question. In our view the top-down methodology is not capable in itself of producing even a *prima facie* indication that there is or is not a problem. All that it does is suggest that problems are more likely to be found in one sector than another.
 - Second, the top-down methodology is intended to indicate sectors where competition is less likely to be working well, not whether a suitable or proportionate remedy exists. It may be, for example, that high profitability or a concentrated market arises from the cost structure or other industry conditions about which little can be done or where intervention might create costs and distortions that outweigh any benefits.

- Third, the study does not consider the importance of the various sectors or markets for the economy at large, beyond providing a measure of the size of the sector (normally based on the value of UK production). There are clearly some sectors in which market failures would be more significant than others in terms of their knock-on effects elsewhere in the economy. For example, market failure in a transport market may be more significant than failure in a cosmetics market, even if the transport market was smaller.

Limitations

- 1.6 The 'top-down' approach to the identification of problematic markets, constructing indicators from cross-industry data sources, and then attempting to combine them into a single overall ranking of sectors (or set of selected sectors) faces objections at both the theoretical and practical level. The most important problems are discussed in this section.

Theoretical ambiguity

- 1.7 Markets may not work well for consumers for a very wide range of reasons. These different theories of consumer harm are supported by different (and often contradictory) evidence. For example, while a claim of excessive pricing would be supported by high profitability, the existence of predation would be supported by the reverse. To take another example, while transparency of prices may support collusion, it could reduce consumer search costs.
- 1.8 This means that a methodology which identifies high or low values of a particular indicator as being 'worst' is extremely crude. Whether a high ranking of a sector on an indicator would support a particular theory of consumer harm, tend to undermine it, or be neutral typically depends on the particular theory that is being considered.
- 1.9 In principle, one could identify a list of different theories of competitive harm and their associated symptoms, and then test for the existence of each type of problem using a different set of criteria. However, the question would then arise as to how to weight the various different

theories of competitive harm in order to provide an overall ranking. Therefore, while this approach has merit in principle, we did not think it was practical².

Industry classification schemes and coverage

- 1.10 As can be seen from the Annex, different indicators make use of different industry classification schemes. The scheme that we have used as the basic one where possible is UK SIC (2003). Much of the data we have used could be matched with this scheme, although some could not be, in particular the data on consumer complaints, RandD expenditure and advertising to sales ratios. However, these indicators can still be taken into account by examining the worst ranked sectors on these criteria.
- 1.11 Another problem is the variable coverage of the data across indicators. While there are 515 sectors with data from at least one indicator, coverage is not complete for all indicators.

Sensitivity of results to combination methodology

- 1.12 There are many different ways in which the sectoral rankings on the individual indicators could be combined into a single overall ranking (or set of chosen sectors). The two examined here are:
- selection of the worst ranked sectors on each individual indicator
 - taking a weighted average of the rankings of the different indicators (the 'Borda score methodology').

² The approach of testing for different theories of competitive harm is used in merger cases where unilateral and coordinated effects theories are typically considered separately. This approach is well-motivated, since the symptoms of these two theories are to some extent contradictory: for example spare capacity generally hinders unilateral price raising but may facilitate coordination by providing a mechanism for punishing deviators from the coordinated set of prices.

- 1.13 These two methods generate different results. Furthermore, the overall ranking derived from taking a weighted average of rankings on individual indicators is sensitive to the set of weights chosen.
- 1.14 This is not particularly surprising. Since the individual indicators generate significantly different sectoral rankings, the overall rankings inevitably hinge on the weight given to each indicator in the aggregation procedure. It is important to note that the choice of weights is in part of matter of policy, since they reflect, for example, the priority that should be given to investigating highly profitable markets as against those in which there are many consumer complaints.

Broad, eclectic or difficult to interpret SIC codes

Broad

- 1.15 The basic classification of markets that has adopted is the UK SIC (2003) at the 4-digit level. Normally relevant antitrust markets are more finely differentiated than 4-digit SIC codes³: sometimes very much more finely differentiated⁴. To the extent that each 4-digit code is composed of many relevant markets, then even if there is high profitability or concentration at the 4-digit level, without data at a finer level it is not possible to determine which particular markets this arises from. Thus for example, a finding of high profitability or concentration in 'Telecommunications' would be of limited practical value in identifying markets to study. Accordingly, even where an indicator suggests a sector to be worth further consideration, considerable 'bottom up' analysis is still necessary.

³ However, in a few instances, SIC codes may be narrower than antitrust markets. The example of buckets is given by Hay and Morris (1991): 'under this system plastic buckets are classified as Plastics, metal ones as Metal Working, and wooden ones as Wooden products. But clearly, all enter the same market and compete with each other' (p. 207).

⁴ Some examples of 4-digit SIC industries are: 'Manufacture of motor vehicles' (including passenger cars, vans, lorries, trailers and semi-trailers and camping vehicles); 'Manufacture of prepared pet foods'; 'Telecommunications'; 'Manufacture of basic pharmaceutical preparations'.

Eclectic

- 1.16 A related problem is that some SIC codes are eclectic or catch-all categories (e.g. 'Manufacture of other food products not elsewhere classified'). The dilemma posed by these categories is that excluding them risks missing problematic markets which are hidden within these categories, but on the other hand determining the scope of the commercial activities covered by such sectors is not straight-forward on the basis of their published descriptions⁵.

Difficult to interpret

- 1.17 Even putting aside the eclectic codes, many SIC categories are difficult to interpret (e.g. 'Steam and Hot Water Supply', 'Transport via Pipelines'). In these examples, substantial further work would be necessary to identify the relevant economic markets and the firms or organisations active within them.

Government activities and regulated industries

- 1.18 SIC codes include entirely government activities, activities traditionally performed primarily by the State (e.g. 'Primary education') and heavily regulated industries (e.g. 'Transport via railways'). While it is clear that some of these should be excluded (e.g. 'Foreign affairs') the precise scope of the exclusions is controversial and we have not removed any sectors from the analysis on these grounds.

Markets missed through aggregation and averaging problems within SIC codes

- 1.19 Because a SIC code will typically consist of a large number of relevant markets, problem markets may be missed through aggregation and averaging problems. For example, assume that there are 10 relevant

⁵ Available at [http://www.statistics.gov.uk/methods_quality/sic/downloads/UK_SIC_Vol1\(2003\).pdf](http://www.statistics.gov.uk/methods_quality/sic/downloads/UK_SIC_Vol1(2003).pdf)

markets which comprise a SIC code and that 10 firms have a 100% market share. At the SIC code level the C3 ratio would only be 30%, even though this in fact represents ten monopolies.

- 1.20 A separate way in which markets may be missed is through **averaging** results across relevant markets. Thus, assume that a SIC code consists of two markets, one of which is highly profitable and one of which is severely loss making. The average profitability at the level of the SIC code will be normal, and so the highly profitable market will be hidden. Versions of this problem apply to a number of indicators.
- 1.21 These problems mean that the indicators can at best only be regarded as a **one-way test**. Where a sector is ranked among the worst on a given indicator, this implies there is some **prima facie** evidence of a problem. However, being ranked among the best sectors on an indicator may not imply the absence of a problem.

Narrower and wider markets

- 1.22 The indicators are all constructed on a UK-wide basis. The implicit assumption is that the relevant geographic market is the UK. However, in practice the relevant geographic market may be narrower (e.g. regional or local) or wider (e.g. European or global).
- 1.23 Where geographic markets are narrower, the problem faced is that, through considering indicators at the UK level, problem markets may be missed through the aggregation and averaging problems described in the previous section.
- 1.24 By contrast, where geographic markets are wider than the UK, the indicators may give a false positive, suggesting that there is a problem when there is none. For example, where concentration measured relative to the UK is high, frequently concentration measured on a European basis will be lower. Similarly, an industry with low churn on a UK basis may be more dynamic when allowing for entry and exit by European firms.

Omitted factors

- 1.25 Many factors relevant to how well a market is functioning are not captured by any of the empirical indicators that we have been able to populate. These include the pattern of pricing, price-cost margins, buyer power, whether the market is a bidding market, licensing and planning barriers to entry, network effects and informational conditions. These issues would need to be addressed in any more detailed analysis.

Low quality indicators

- 1.26 For a variety of reasons the individual indicators have a number of limitations in terms of their reliability of identifying problematic markets. For example, the concentration data that we have used is based on UK production, rather than UK consumption. A combination procedure aggregating the results of a number of indicators inherits the problems of the individual indicators, and this should be borne in mind when interpreting the results.

Data sources

Primary data sources

- 1.27 NERA located a large number of free and commercially available databases which are potentially useful for the purpose of conducting a top-down analysis. These can conveniently be classified into four groups as follows:

Industry level

- ONS: Annual Business Inquiry, Size Analysis of UK Businesses, Statistics of Product Concentration of UK Manufacturers, Report on the Census of Production, Producer Price Indices, Productivity Tables, United Kingdom Trade in Goods analysed in terms of Industry
- DTI: Small Business Services, SME Statistics for the UK

- OECD databases: STAN/ANBERD
- UK trade info databases: UK Trade data; PRODCOM, UK Regional Trade Statistics
- Eurostat's databases: NewCronos datasets
- Advertising Association databases: Advertising Statistics Yearbook
- Community Innovation Survey.

Company level

These mainly contain information from financial statements and stock market data. There are three main providers of such financial data, namely Bureau van Dijk, ICC and Thomson Financial. The relevant products are as follows:

- Bureau van Dijk: Amadeus, FAME, Orbis, Osiris
- ICC: PLUM;
- Thomson Financial: Company Analysis, Thomson One Banker, Datastream Advance.

Scanner data

- AC Nielsen
- IRI.

Industry reports

- Snapshots International
- Prospect Shop Business Ratio Reports
- Key Note Market Reports

- Euromonitor’s reports: Major Market Profiles; Consumer Europe
- Mintel’s Sector Reports
- Datamonitor Market Reports
- Plimsoll.

Following consultation with the OFT, it was decided that:

- Of the company level databases, the FAME database would be used
- The scanner data would not be used on the grounds of cost
- The industry reports would not be used as part of the top-down methodology since they are not available in a unified electronic format.

Secondary data sources

1.28 In addition to the primary data sources, a number of additional sources have been used such as AC Nielsen’s study of international price comparisons (AC Nielsen (2000)), the DTI’s report on switching costs⁶ and the information on consumer complaints from trading standards departments published in OFT *Trends*⁷. The full list of data sources is shown in the Annex.

Indicators

1.29 The table in the Annex shows 32 empirical indicators grouped into 9 categories⁸. The data source and the industry classification scheme are shown together with comments on the rationale for, and key problems

⁶ DTI (2000) Switching Suppliers. Consumer Affairs Report Series Executive Summary No. 2

⁷ Issues of Trends are available at: <http://www.of.gov.uk/news/statistics/trends.htm>

⁸ Namely barriers to entry, productivity, concentration, profitability, prices, consumer complaints, innovation, switching costs and others.

with, the indicator. In this section we summarise briefly the results from these indicators⁹.

Barriers to entry

- 1.30 Of the indicators we have been able to populate, the three indicators of barriers to entry that we consider most useful are churn, the advertising to sales ratio and the Cost Disadvantage Ratio.

Churn

- 1.31 Churn is defined as the ratio of the total number of firms entering or exiting the market in a given year divided by the number of established firms. The indicator can be populated using data on VAT registrations of firms in 3-digit sectors collected by the Small Business Service of the DTI. The rationale for the measure is that the history of actual entry and exit provide a guide to whether any barriers to entry and exit can in practice be surmounted.

Table 1.1 :Lowest 10 Churn rates in the UK, 2001 data

Rank	Industry Description Provided In VAT figures	Churn rate for 2001 ¹⁰
1	Extraction and agglomeration of peat	0.000
2	Mining of iron ores	0.000
3	Production of salt	0.000
4	Processing of nuclear fuel	0.000
5	Transport via pipelines	0.000
6	Provision of services to the community as a whole	0.000
7	Administration of the State and the economic and social policy of the community	0.012
8	Manufacture of grain mill products, starches and starch products	0.038
9	Activities of other membership organisations	0.040
10	Higher education	0.045

Source: *Small Business Service of the DTI.*

⁹ Information problems are also briefly considered although no empirical indicators suitable for a top-down approach have been found.

¹⁰ The definition of churn is as follows:
$$\text{churn}_{2001} = \left(\frac{[2002 \text{ registrations}] + [2001 \text{ deregistrations}]}{\text{Total VAT registered firms in 2001}} \right)$$

Advertising to sales ratio

- 1.32 The rationale for examining the advertising to sales ratio is that where this ratio is high, it is likely that an entrant would have to spend large sums on advertising in order to win significant business. These sunk costs can only be recouped if they are spread across a large number of sales, making small-scale entry more difficult. The UK sectors with the ten highest advertising to sales ratios in 2001 are shown below.

Table 1.2: High advertising - sales ratios in the UK (2001 data)

Rank	Product	Advertising/sales (%) for the UK
1	Denture fixatives	29.38
2	Bleaches and lavatory cleaners	25.51
3	Shampoos	20.17
4	Smoking cessation	14.37
5	Condiments	12.73
6	Sleeping aids	12.47
7	Lawn fertilizer	12.15
8	Soap	11.88
9	Bottled sauces (food)	11.79
10	Cough liquids	11.30

Source: Advertising Association

Cost disadvantage ratio

- 1.33 Caves et al (1975) examined the ratio of value added per worker in the smallest plants which account for the first 50% of output to the largest plants accounting for 50% of output. This is intended as a measure of economies of scale in an industry. This measure is most suitable for the manufacturing sector, where a measure of physical output is available. Here we have defined the Cost Disadvantage Ratio as the ratio of the value added per worker in the smallest firms accounting for 50% of turnover to the value added per worker in the largest firms accounting for 50% of turnover.

Table 1.3 : 10 UK Sectors with lowest cost disadvantage ratio

Rank	Sector	Cost Disadvantage Ratio
1	Activities of other transport agencies	-16.71
2	Transport via railways	-4.57
3	Manufacture of other organic basic chemicals	-2.05
4	Manufacture of motorcycles	-1.76
5	Mining and agglomeration of hard coal	-0.74
6	Other computer related activities	-0.66
7	Other farming of animals	-0.59
8	Research and experimental development on social sciences and humanities	-0.54
9	Manufacture of essential oils	-0.44
10	Other publishing	-0.25

Source: FAME dataset and NERA Analysis

- 1.34 A negative cost disadvantage ratio arises when the smallest firms accounting for the first 50% of output are making losses.

Productivity

- 1.35 The rationale for examining productivity as an indicator is two-fold. First, in sectors where productivity is lower than it otherwise might be, a given level of output could be achieved with fewer inputs and production is inefficient. Second, low productivity may arise in sectors where competition is relatively weak and the less productive firms are not eliminated from the market.
- 1.36 The two measures of productivity that we have considered are **labour productivity** (LP) and **total factor productivity** (TFP). For each of these two measures of productivity, three different sectoral comparisons can be made: of productivity **levels**; of the rate of productivity **growth** and of the change in the **dispersion** of productivity. This therefore generates six indicators. It was agreed that for the purposes of this exercise the two measures of productivity growth would be used. The database we have used to populate these productivity measures is FAME, with data classified at the 4-digit level using the UK SIC (2003) scheme.

1.37 A difficulty that arises is that physical output measures do not exist for all sectors of the economy. It is therefore necessary to a proxy for output in an exercise which compares across all sectors. The two that are suggested in the literature are turnover and value added: for this exercise turnover has been used. The interpretative problem this creates is that growth in turnover could either result from increases in physical output or prices.

Labour productivity growth

1.38 Annual average labour productivity growth rates for the period 1998 to 2002 are shown below.

Table 1.4: Average annual LP growth rates - 1998 to 2002

Rank (Low ranks worst)	Industry	Average Annual LP growth rate
1	Collection and treatment of other waste	-48%
2	Activities of trade unions	-40%
3	Manufacture of prepared unrecorded media	-32%
4	Manufacture of leather clothes	-30%
5	Manufacture of pesticides and other agro-chemical products	-25%
6	Manufacture of articles of cork, straw and plaiting materials	-22%
7	Manufacture of essential oils	-19%
8	Manufacture of macaroni, noodles, couscous and similar farinaceous products	-14%
9	Extraction and agglomeration of peat	-13%
10	Secretarial and translation activities	-13%

Source: FAME dataset and NERA analysis

Total factor productivity growth

1.39 The table reports average annual total factor productivity growth rates for 1998 to 2002.

Table 1.5: Average annual TFP growth rates - 1998 to 2002

Rank (Low ranks worst)	Industry	Average Annual TFP Growth Rates
1	Transport via pipelines	-48.9%
2	Manufacture of leather clothes	-29.1%
3	Manufacture of articles of cork, straw and plaiting materials	-23.6%
4	Manufacture of prepared unrecorded media	-23.4%
5	Collection and treatment of other waste	-16.2%
6	Manufacture of sugar	-16.0%
7	Manufacture of pesticides and other agro-chemical products	-14.7%
8	Manufacture of steam generators, except central heating hot water boilers	-13.4%
9	Quarrying of limestone, gypsum and chalk	-12.3%
10	Canteens	-12.1%

Source: FAME dataset and NERA analysis

Concentration

1.40 The most useful cross-sectoral source of data on concentration is the C3 and C5 ratios for the period 1998 to 2002 that are commercially available from the ONS¹¹. There are two major problems with this data. The first is that it relates to UK production and not consumption. The second is that the entire turnover of a firm is allocated to the primary SIC code of that firm. To mitigate the first problem, we show below the

¹¹ Information on individual market shares can be computed from the FAME database which is based on company accounts. However, there is serious problem of double counting since subsidiaries and parents are not distinguished. For this reason the concentration measures based on FAME data have not been used in the empirical tool.

sectors with the highest C3 ratio subject to the condition that their imports are 'low', in the sense that the ratio of imports to UK production is in the bottom half of sectors on which we have import data (or alternatively that there is no import data).

C3 concentration ratios

Table 1.6: Average C3 ratios in the UK – 1998 to 2002

Rank	Sector	Average C3 Ratio
1	Steam and hot water supply	99.70
2	Manufacture of tobacco products	98.02
3	Manufacture of lime	97.86
4	Processing of nuclear fuel	97.69
5	National post activities	97.18
6	Manufacture of flat glass	96.72
7	Manufacture of plaster products for construction purposes	96.33
8	Manufacture of agricultural tractors	95.95
9	Manufacture of gas	95.53
10	Manufacture of plaster	91.08

Source: ONS Annual Business Inquiry. Note: In this table, only sectors in which import penetration is 'low' have been listed (that is, the ratio of imports to UK production is in the bottom half of sectors on which we have import data, or alternatively that there is no import data on the sector)

Volatility of concentration

1.41 The table shows the coefficient of variation¹² of C3 for the period 1998-2002.

¹² That is, standard deviation divided by the mean.

Table 1.7: Coefficient of Variation of C3 for Period 1998-2002

Rank	Sector	Coefficient of variation
1	Steam and hot water supply	0.0063
2	Manufacture of Lime	0.00976
3	Manufacture of Coke Oven Products	0.010093
4	Manufacture of plaster products for construction purposes	0.01066
5	Manufacture of basic iron and steel and of ferro-alloys	0.01214
6	Manufacture of soups	0.013112
7	Manufacture of agricultural tractors	0.01429
8	Manufacture of sugar	0.016157
9	Manufacture of gas; distribution of gaseous fuels through mains	0.016194
10	Courier Activities other than national post activities	0.019417

Source: ONS Annual Business Inquiry

Profitability

1.42 The following table shows the ten industry sectors in which the difference between the return on capital employed (ROCE) and the cost of capital is largest. In sectors where there is at least one quoted company, the cost of capital has been estimated for the sector. In the other sectors, an average cost of capital has been used. This was calculated as the turnover-weighted average cost of capital of sectors in which a quoted company is present.

Table 1.8: Industry sectors with greatest average difference between ROCE and cost of capital - average for period 1999 to 2002

Rank	Sector	ROCE minus Cost of Capital (%-point)
1	Repair of electrical household goods (*)	199.7%
2	Justice and judicial activities (*)	89.9%
3	Non-life insurance/Reinsurance	73.1%
4	Manufacture of homogenised food preparations and	64.8%
5	Manufacture of leather clothes (*)	46.8%
6	Pension funding (*)	42.8%
7	Cold drawing (*)	42.7%
8	Manufacture of musical instruments (*)	39.9%
9	Manufacture of other technical ceramic products (*)	39.1%
10	Other cleaning services	35.5%

Source: NERA calculations on the basis of the FAME database. For sectors marked (), an average cost of capital has been used.*

Prices

- 1.43 The two data sources that produced indicators that could potentially be used in a top-down study were the AC Nielsen study on international price comparisons for the DTI published in 2000, and the data on producer price indices published by the ONS¹³.
- 1.44 The AC Nielsen study compared the retail prices of 56 consumer goods in the UK with prices in Germany, France and the US. The study was carried out in November/December 1999. Prices in two major cities in each of the four countries were surveyed¹⁴. Three different types of outlet were represented: supermarkets, specialist stores (e.g. bakers, butchers and off-licenses) and general stores (e.g. department stores). The study was a 'snapshot' of price comparisons at a single point in time with prices being collected in November and December 1999.

¹³ Available at <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=2208>

¹⁴ For the UK, London and Manchester; for France, Paris and Lyon; for Germany, Hamburg and Dusseldorf and for the US, Atlanta and Chicago.

- 1.45 Both branded and unbranded products were considered in the study. UK prices were found to be significantly more expensive than all three countries in the case of nine products¹⁵ and significantly cheaper than all three countries for three products¹⁶.
- 1.46 We decided not to incorporate these results in the top-down empirical tool. This was primarily because of the limited coverage in that the question of the relative price of the UK as compared with its comparators was only resolved for 12 items. In addition, the study considered a 'snapshot' for November/December 1999. It is possible (as in the case of new motor cars) that with the weakening of sterling since that time the results would be quite different if the study were repeated today.
- 1.47 As for the producer price indices published by the ONS, we produced a ranking showing which sectors had the fastest growing producer prices. However, this is not particularly informative as an indicator given that the growth in prices may be explained by increases in costs or changes in the quality of goods. Accordingly, we have not used this price information in the top-down empirical tool.

Consumer complaints

- 1.48 By far the most comprehensive source of data concerning consumer complaints relates to complaints received by the trading standards departments. These are aggregated by the OFT and the data is presented in its *Trends* publication.¹⁷
- 1.49 A potential drawback of the *Trends* data is that it is likely to underestimate the complaints made in sectors where a specialised consumer complaints body exists, since consumers are likely to take complaints to those bodies. To address this issue, we adjusted the

¹⁵ Top 10 CDs, Sega Dreamcast, Coca-cola 2 litres, Ground coffee 200-250g equivalent, Lager, Dog food 800g equivalent, Pantene Pro V 200ml equivalent, Shampoo 250ml equivalent, Toilet tissue 4-pack equivalent

¹⁶ Kellogg's Cornflakes 500g equivalent, Chocolate chip cookies 200g equivalent, Men's Shirt

¹⁷ Issues of Trends are available at: <http://www.of.gov.uk/news/statistics/trends.htm>

Trends data to incorporate complaints received by five of the main sectoral consumer complaints bodies (Financial Ombudsman, Oftel/Ofcom, ABTA, Energywatch and Postwatch).

1.50 Three other sources of consumer complaints data were investigated: namely complaints to the BBC TV programme *Watchdog*, complaints websites¹⁸, the Advertising Standards Agency and the ITC. The sectoral rankings obtained from these sources were broadly consistent with the trading standards data, although the number of complaints from these sources is very much smaller. As the main index of consumer complaints we have therefore used the consumer complaints received by trading standards departments, adjusted by complaints from five of the main sectoral complaints bodies.

Table 1.9: Complaints received by Trading Standards Departments April 2002 to March 2003

Rank	Sector	Number of Complaints Received
1	Home maintenance, repairs and improvements	81,364
2	Electricity	66,830
3	Second-hand motor vehicles	63,678
4	Telecommunications exc. mobile phones	63,307
5	Mobile phones and Services	59,346
6	Other personal goods and services	48,942
7	Gas	41,952
8	Holidays/Travel agents	36,581
9	Radio, TV and audiovisual equipment	34,909
10	Large white goods and major fixed appliances	34,086

Sources: OFT Trends, websites of Financial Ombudsman, Oftel/Ofcom, ABTA, Energywatch and Postwatch. The OFT Trends data was adjusted to include complaints from the listed sectoral regulators.

1.51 We also constructed an indicator of complaints per pound spent based on OFT *Trends* data and expenditure data from the ONS. However, these

¹⁸ Specifically <http://www.grumbletext.co.uk/>, <http://www.complaintinfo.com/>, and <http://www.clik2complaints.co.uk/>

two sources use very different sectoral classification schemes and the matching is imperfect. Second, if a complaints per pound measure is used it would be necessary to take into account in addition differences in sectoral size. It is not therefore clear that this measure is superior, and we have preferred the simpler measure¹⁹.

Innovation

- 1.52 The indicator of innovation that we considered to be potentially most useful was an international comparison of RandD to sales ratios between the UK and peer countries (France, Germany, Italy, Japan and the United States). Those sectors in which the RandD to sales ratio is low in the UK compared to peer countries are shown in the table below.

¹⁹ In addition, there is the problem of different sizes of transaction, which applies to both of these measures. Suppose a pianist purchases a grand piano for £100,000 finds it sub-standard and makes a complaint. Now contrast this to the case where 200 TVs are bought for £500 and half of the purchasers find that their sets are faulty and complain. In the piano sector there is only 1 complaint per £100,000 spent while in the TV sector there are 100, and so on the measure of complaints per pound the TV appears far worse. But all the pianos sold were faulty whereas only half the TVs were.

Table 1.10: Sectors with low RandD to sales ratio compared to peer countries

Rank	Sector	Ratio of (RandD/Sales) in UK to peer countries (1997-2000 average)
1	Office, accounting and computing machinery	0.13
2	Rubber and plastics products	0.14
3	Construction	0.39
4	Non-ferrous metals	0.39
5	Furniture; manufacturing n.e.c.	0.40
6	Other non-metallic mineral products	0.49
7	Radio, television and communication equipment	0.52
8	Medical, precision and optical instruments	0.52
9	Fabricated metal products, except machinery and equipment	0.60
10	Aircraft and spacecraft	0.66

Source: NERA analysis on basis of ANBERD/STAN database

1.53 International comparison of RandD expenditures can also be undertaken using the DTI Research and Development scoreboard²⁰. Comparison of the results is rather difficult because the databases employ different classification schemes.

1.54 We also considered whether comparison of the ratio of patents to sales internationally might be useful. In theory, patents are an attractive measure of innovation, since they are closer to being a measure of innovation 'output' than RandD expenditure, which is a measure of 'input'. There are a number of problems with implementation of this. First, simply looking at the **number** of patents in a sector makes no allowance for the significance of the inventions. Second, even if an innovation takes place within one country, patents will often be taken

²⁰ Available at http://www.innovation.gov.uk/projects/rd_scoreboard/2003.csv

out across a range of jurisdictions. Finally, patents are classified in the UK by the UK Patent Classification Key and sales data for these categories does not exist.

1.55 Finally, we considered the survey data from the Community Innovation Survey. This has data for European Member States on the percentage of firms which describe themselves as:

- being 'innovation active'
- having a product or process innovation
- having a novel product
- undergoing organisational change.

1.56 The indicators from the Community Survey have not been used as the data is compiled at a very aggregated level (the economy is divided into only 8 sectors). In addition, concepts such as being 'innovation active' are likely to be interpreted in different ways by different firms.

Switching costs

1.57 Data on the actual levels of switching over a number of years could be useful as a **prima facie** indicator, as could survey data on customers' perceived ease of switching. A recent study by the DTI²¹ examined the actual levels of switching in six selected sectors²² over the period 1995-2000. Of the industries studied, current accounts had the lowest levels of switching. Banking also had the second highest level of perceived switching costs. The sectoral coverage of the DTI study however is much too limited to take into account in the top-down methodology.

²¹ DTI (2000) Switching Suppliers. Consumer Affairs Report Series Executive Summary No. 2

²² Energy (electricity/gas), fixed line telephones, mobile telephones, insurance (home insurance/car insurance), banking (current accounts/savings accounts), mortgages.

Information

1.58 Informational asymmetries may result in markets which do not work well for consumers. For example, this may occur where:

- there are high search costs
- there is 'focal' competition;
- goods are bundled or there are after-markets
- products are complex
- purchases are infrequent
- credence goods are being sold
- commission payments are made to salespeople.

1.59 However, as pointed out by the OFT Research Brief, these are unsuitable for a top-down methodology.

1.60 Price dispersion may provide an indirect proxy of search costs, although again this is not suitable for a top-down methodology as price data at a sufficiently detailed level is not available on a cross-sectoral basis at reasonable cost.

Others

1.61 Three other indicators have been constructed for use in the empirical tool. These are:

Import penetration.

1.62 The measure of import penetration used is the ratio of imports to UK production. The data on UK production is inferred from the data on C3 and C5 ratios supplied by the ONS, while the import data also derives

from the ONS²³. For a number of reasons, these data sources do not match perfectly, but since this is such an important indicator in principle, these data sources have been combined.

- 1.63 Data on imports only existed for 268 sectors. Sectors where data on imports did not exist were treated as having zero imports.

Market growth 1998-2002.

- 1.64 The market growth indicator shows the percentage growth in UK production for the period 1998-2002. Although theoretically ambiguous, in general we would expect rapid market growth to reduce concerns as it provides opportunities for new entrants.

Market size

- 1.65 We have included alongside the results a measure of market size. For the SIC compatible indicators this is based on UK production for 2002 and derives from the ONS concentration data. In addition the Advertising Association provide data on consumer expenditure in classes where the advertising/sales ratio is measured.
- 1.66 While market size is not particularly relevant to whether a market is functioning well for consumers, it may be useful in terms of prioritising markets. It should be noted however, that the largest sectors, such as 'Telecommunications', are the most aggregated and contain an unhelpfully large number of relevant markets, while the smaller sectors, such as 'Production of Salt', are much closer to relevant anti-trust markets.

²³ Available at <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=731>

Combining the indicators

Weighting indicators

- 1.67 It is clear that some indicators should be accorded greater weight than others. Different weights reflect three different factors:
- 1.68 First, different indicators are associated with different types of problem market. Thus the profitability indicators are designed to identify markets in which excessive pricing is taking place, while the consumer complaints indicators would normally deal with cases of goods or services which are misdescribed or are otherwise of unsatisfactory quality. The weight to be given to these two groups of indicators accordingly would in part reflect the priority given to investigating these two types of problem.
- 1.69 Second, even if it is possible to measure the indicator accurately using available data, it may not reliably identify a particular type of problem market. Thus for instance an international price comparison, even performed with rich data and defensible methodology, may not reliably indicate excessive pricing in a particular country because of differences in costs. It is therefore desirable to weight more heavily indicators which are more reliable as indicators of a certain type of problem.
- 1.70 Third, for a wide range of reasons, the actual indicators constructed are often relatively poor proxies. For example, the average turnover of the largest firms accounting for the first 50% of total industry turnover divided by total industry turnover is not a particularly good proxy for minimum efficient scale. Accordingly, it is desirable to exclude or place less weight on indicators which are poorly measured.
- 1.71 Given that the top-down methodology provides only an initial indication of where competition problems are more likely to be identified it is likely to have a very high failure rate once the OFT begins to review the results (in the sense that the large majority of sectors that come up are likely to be rejected for further inquiry on initial inspection). The best weighting systems will be those that produce a higher level of 'success' than

others. Experience in using different weighting systems, and inspecting the results, is likely to point to refinements of the weighting systems that we have initially used, or point to multiple weighting systems. Accordingly, the weighting systems that we present here are illustrative, and are not intended to be definitive.

- 1.72 Of the 32 indicators shown in the Annex that have been populated, the following 11 have been made use of in the empirical tool. The final column shows whether they are 'SIC compatible' in the sense of being matchable with the basic UK SIC (2003) 4-digit scheme that we have used without excessive loss of information.

Table 1.11: Key indicators

Short Name	Description	SIC-compatible
Concentration (C3)	Average C3 concentration ratio 1998-2002	Yes
Profitability	Average difference between ROCE and cost of capital for 1999-2002	Yes
Complaints Received by trading standards	Complaints Received by trading standards 2002-2003 adjusted to include complaints received by Financial Ombudsman, Oftel/Ofcom, ABTA, Energywatch and Postwatch	No
Concentration Volatility	Coefficient of variation of C3 ratio for period 1998-2002	Yes
Churn	(VAT registrations in 2002 plus de-registrations in 2001) divided by VAT registered firms in 2001	Yes
Productivity		
TFP Growth	Average annual growth in TFP levels 1998-2002	Yes
LP Growth	Average annual growth in Labour Productivity (LP) levels for 1998-2002	Yes
Advertising to Sales Ratio	Advertising to Sales Ratio 2001	No
Cost Disadvantage Ratio	The ratio of the value added per worker in the smallest firms accounting for 50% of turnover to the value added per worker in the largest firms accounting for 50% of turnover (average 1998-2002).	Yes
Innovation	Ratio of (RandD/Sales) in UK compared to France, Germany, Italy, Japan and the United States	No
Import Penetration	Ratio of imports to UK production (average over 1998-2002)	Yes

1.73 We propose two different combination methodologies.

Worst ranked sectors on each indicators

- 1.74 The first approach to combining the indicators is to take the worst performing sectors on each of the key indicators that have been identified. In Table 1.12, the five most concentrated, profitable and complained about sectors are summarised. The worst three sectors on the remaining indicators are also listed. Two sectors (Steam and Hot Water supply and Manufacture of Lime) are among the most concentrated and have the lowest volatility of concentration.
- 1.75 This approach has two advantages. First, the rationale for the selection of the given sectors is clear (e.g. the sector is highly concentrated or profitable) and this provides a definite focus for further investigations of the sector. Second, this method side steps the problem of different industry classification schemes.
- 1.76 On the other hand, the approach limits the ability to combine information from different indicators. The 31 sectors identified by this methodology are shown in the table below.

Table 1.12: Worst ranked Sectors on the key indicators

Indicator	Rank (Low ranks worst)	Sector	Market size measure (£m)
Concentration (C3)- note (1)	1	Steam and Hot Water Supply	89
	2	Manufacture of tobacco products	5,227
	3	Manufacture of lime	532
	4	Processing of nuclear fuel	1,495
	5	National Post Activities	7,655
Profitability	1	Repair of electrical household goods	332
	2	Justice and judicial activities	-
	3	Non-life insurance/Reinsurance	-
	4	Manufacture of homogenised food preparations and dietetic food	69
	5	Manufacture of leather clothes	89
Complaints received by Trading Standards	1	Home maintenance, repairs and improvements	28,340
	2	Electricity	7,332
	3	Second-hand motor vehicles	18,304
	4	Telecommunications exc. mobile phones	8,008
	5	Mobile phones and Services	4,836
Concentration Volatility	1	Steam and Hot Water Supply	89
	2	Manufacture of lime	532
	3	Manufacture of Coke Oven products	21
Churn	1	Extraction and agglomeration of Peat	13
	1 (=)	Mining of Iron Ores	-
	1 (=)	Production of salt	97
Productivity - note (2)	1	Activities of trade unions	666
	2	Collection and treatment of other waste	4,186
	3	Manufacture of leather clothes	89
Advertising to Sales Ratio	1	Denture fixatives	18
	2	Bleaches and lavatory cleaners	41
	3	Shampoos	274
Cost Disadvantage Ratio	1	Activities of other transport agencies	11,900
	2	Transport via railways	5,341
	3	Manufacture of other organic basic chemicals	8,329
Innovation: ratio of RandD expenditure in the UK to that in peer countries	1	Office accounting and computing machinery	13,459
	2	Rubber and Plastics Products	18,376
	3	Construction	115,714

Notes: (1) The criterion adopted was to choose those sectors with the highest production-based C3 subject to the condition that the ratio of imports to UK production is among the ranked among the lowest half. (2) An unweighted average of the rankings of TFP and LP growth has been taken.

Weighted average across indicators (Borda scores)

SIC-compatible indicators

- 1.77 The second approach is to take a weighted average of ranks across indicators where this is possible, namely for the SIC-compatible indicators. That is, the overall ranking of sector s , r^s is given by:

$$r^s = \sum_i w_i r_i^s$$

where r_i^s is the ranking of sector s on indicator i . The weighting scheme that has been adopted is shown below. For example, the weight on concentration would be $w_i = 5/27$.

Table 1.13: Weighting scheme

Sector	Weight (1 = low, 5 = high)	Sectoral Coverage (out of 515)
Concentration (C3)	5	459
Profitability	5	499
Import Penetration – <i>Note (4)</i>	5	515
Concentration Volatility	3	458
Churn	3	504
Productivity		
TFP Growth	2	483
LP Growth	2	485
Cost Disadvantage Ratio	2	504
Total	27	

Notes: (1) Indicators with zero weight have been omitted from the table. (2) For this exercise the two productivity indicators have been treated separately as has import penetration. (3) 'Sectoral coverage' refers to the number of sectors for which data exists on the indicator. (4) Import data exists for 268 sectors but the remaining sectors have been treated as having zero imports.

- 1.78 The overall ranking when this weighted average scheme is applied is shown in Table 1.14.

Table 1.14: Worst 15 sectors based on weighted average of SIC-compatible indicators

Rank	Sector	Concentration (rank out of 459)	Profitability (rank out of 499)	Import Penetration (rank of out 515)	Concentration volatility (rank out of 458)	Churn (rank out of 458)	TFP Growth (rank out of 474)	LP Growth (rank out of 478)	Cost Disadvantage Ratio (rank out of 504)	Market Size Measure (£m)
1	Processing of nuclear fuel	6	192	336	10	5.5	-	-	-	1,495
2	Retail sale of cosmetic and toilet articles	59	69	1	15	143	141	291	221	1,985
3	Wholesale of tobacco products	38	21	1	184	260	19	15	423	5,272
4	Other supporting land transport activities	39	75	1	71	291	274	244	252	4,109
5	Wholesale of mining, construction and civil engineering machinery	242	118	1	72	107.5	71	143	331	2,118
6	Manufacture of sugar	3	114	409	6	163	6	16	145	1,248
7	Other scheduled passenger land transport	63	193	1	64	343.5	153	252	123	6,305
8	Retail sale of books, newspapers and stationery	229	18	1	35	350.5	158	89	368	5,158
9	Retail sale of bread, cakes, flour confectionery and sugar confectionery	224	56	1	123	317	47	54	359	1,421
10	Youth hostels and mountain refuges	64	256	1	246	288	-	-	468	64
11	Gambling and betting activities	106	110	1	164	231.5	340	379	38	21,100
12	Retail sale of medical and orthopaedic goods	124	119	1	385	143	237	207	64	322
13	Manufacture of other machine tools not elsewhere classified	191	195	1	182	59.5	84	51	455	964
14	Repair of electrical household goods	168	1	1	205	458.5	46	14	466	332
15	Wholesale of sugar and chocolate and sugar confectionery	99	13	1	301	260	328	368	138	2,448

Note: Sectors where data on concentration and profitability were not available have been excluded. 449 sectors (out of 515) are ranked.

- 1.79 A practical problem in constructing this weighted average is that there are 'missing observations'. There are 515 sectors on which there is data on **some** SIC-compatible indicator. However, the coverage varies from indicator to indicator. The approach adopted is to exclude those sectors which lack data on the concentration (C3) and profitability indicators but impose no requirement as to the remaining indicators²⁴.
- 1.80 We stress two key points. First, **the results are sensitive to the weighting scheme chosen**. This is inevitable since the individual indicators generate significantly different rankings: as the weight on any individual indicator is increased at the expense of the other indicators, the overall ranking will more closely approximate the ranking generated by that indicator. In these circumstances we did not consider that it would be illuminating to provide the results under many different sets of weights, but have provided results under one illustrative scheme.
- 1.81 Second, **the weights are at least in part a matter of policy**. The weights in part reflect the policy priority to be attributed to investigating sectors which are highly profitable, concentrated, exhibit low productivity growth, are much complained about, and so on. In principle, it might be possible, given a sufficiently long series of previous decisions on whether to investigate markets, to back out implicit rules that the competition authority is applying²⁵. However, in this case such an approach does not appear feasible.

Non-SIC compatible indicators

- 1.82 The ranking approach described below does not cover the non-SIC compatible indicators. To compensate for this limitation we suggest worst ranked sectors from Table 1.12 are taken in the following categories:

²⁴ If no requirement that concentration data and profitability is imposed then 12 of the worst 15 sectors would lack data on one of these. These would include inter alia 'Central banking' (2nd worst), 'Justice and judicial activities' (8th) and 'foreign affairs' (10th).

²⁵ For example, the HHI and market share safe havens articulated in the EU Horizontal Merger Guidelines were constructed by examining a large sample of past merger decisions.

- complaints (5 sectors)
- advertising-to-sales ratio (3 sectors)
- innovation (3 sectors).

Prioritisation

- 1.83 There are various methods that could be used to prioritise within lists of sectors identified by these two methodologies.
- 1.84 First, an allowance could be made for sectoral size. The sectors identified above range from £115 billion ('Construction') to £13 million ('Extraction and agglomeration of peat'). Clearly there is an argument for prioritising the larger sectors. On the other hand, the larger categories are often large because they are extremely aggregated while the smaller sectors are closer to relevant markets. Therefore the larger sectors may pose greater challenges in terms of locating relevant markets. Also the problem of interpreting the indicators when they are in effect the results of averages across a large number of diverse relevant markets is greater.
- 1.85 Second, eclectic categories (e.g. 'Manufacture of other foods not elsewhere classified') or those otherwise difficult to interpret could be removed although this obviously risks missing markets.
- 1.86 Third, one could inspect the sectors and remove those which appear unsuitable because they are highly regulated or otherwise have extensive government involvement (e.g. 'Processing of nuclear fuels' or 'Primary education').
- 1.87 Fourth, as stated at the outset, no allowance has been made for the relative importance of sectors to the functioning of the economy as a whole, which is not completely captured by the size of the sector. It is presumably desirable to prioritise economically important sectors.
- 1.88 Since the scope of the exclusions on the grounds described above is likely to be controversial, we applied the mechanical procedure to generate a larger set of sectors than the 5 to 10 stipulated by the OFT's

Research Brief, as it is likely that the OFT would wish to exclude at least some of these sectors on these grounds at a later stage.

Individual sectors

- 1.89 The purpose of this section is briefly to discuss the 26 sectors generated by methodology described above. It explains why the sectors have been selected as possible candidates by the tool and any offsetting factors among the indicators.
- 1.90 The 26 sectors are grouped into four categories: those generated by a weighted average of SIC-compatible indicators, those in which complaints are high, those with a high advertising to sales ratio and those performing badly on the innovation indicator.

Weighted Average of SIC-Compatible Indicators

Processing of nuclear fuel

- 1.91 Processing of nuclear fuel is among the 5% most concentrated sectors and is among the lowest 5% in terms of concentration volatility and churn. In addition it is in the worst half in terms of profitability²⁶. It is however a heavily regulated industry which may argue against additional investigation by the OFT.

Retail sale of cosmetic and toilet articles

- 1.92 The retail sale of cosmetic and toilet articles is in the worst quartile as regards concentration, profitability and concentration volatility, and the worst half as regards churn, TFP growth and the cost disadvantage ratio. There are no recorded imports. On the other hand, the sector is in the top half on LP growth.

²⁶ Throughout this section, 'worst' in respect of profitability refers to those sectors in which profitability is high.

Wholesale of tobacco products

- 1.93 The wholesale of tobacco products is among the 10% most concentrated and profitable sectors, and also is among the worst 10% in terms of productivity growth, on whichever of the two measures is used. There are no recorded imports. The sector is large²⁷, with a market size of £5.2 billion. However, it is among the best half in terms of churn and the cost disadvantage ratio, which provides some evidence that barriers to entry may be low.

Other supporting land transport activities

- 1.94 This is among the 10% most concentrated sectors, is in the top quartile in profitability and the lowest quartile in concentration volatility. There are no recorded imports. However, it is among the best half in terms of churn and the cost disadvantage ratio, which provides some evidence that barriers to entry may be low. The scope of the commercial activities that are included within this SIC code is not clear.

Wholesale of mining, construction and civil engineering machinery

- 1.95 This is in the worst quartile on profitability, concentration volatility, churn and TFP Growth. There are no recorded imports. On the other hand, the sector is relatively unconcentrated and the measured cost disadvantage for smaller firms is not great (in the top half of sectors on both these indicators).

Manufacture of sugar

- 1.96 Sugar is among the 5% most concentrated sectors and is in the lowest 5% as regards concentration volatility and productivity growth (whether measured by TFP or labour productivity). It is also among the worst half on profitability, churn and the cost disadvantage ratio. However, it is one

²⁷ With regard to market size, the following definitions are used in this section: very large (> £15 billion); large (> £5 billion); small (< £500 million); very small (< £100 million).

of the most open sectors (in the top quartile), which suggests that the relatively high concentration figure based on UK production is misleading as foreign competitors are able to reach UK consumers.

Other scheduled passenger land transport

- 1.97 This sector is in the worst quartile on the concentration, concentration volatility and cost disadvantage indicators, and the worst half on profitability and TFP growth. There are no recorded imports and the sector is large, with a market size £6.3 billion. On the other hand, churn is reasonably high (in the top half).

Retail sale of books, newspapers and stationery

- 1.98 This sector is in the worst 10% on profitability and concentration volatility, and the worst half on concentration and productivity (whichever measure is used). There are no recorded imports and the sector is large, with a market size of £5.2 billion. On the other hand, the sector performs relatively well as regards churn and the cost disadvantage ratio (in the top half in both cases), which provides some evidence that barriers to entry are low.

Retail sale of bread, cakes flour confectionary and sugar confectionary

- 1.99 This sector is in the worst quartile as regards profitability and productivity (whichever measure is used), and in the worst half on the concentration and concentration volatility indicators. There are no recorded imports. On the other hand, the sector performs relatively well as regards churn and the cost disadvantage ratio (in the top half in both cases), which provides some evidence that barriers to entry may be low.

Youth hostels and mountain refuges

- 1.100 This sector is among the worst half in terms of concentration and there are no recorded imports. On the other hand, the sector is among the least profitable half of sectors, and the sector is in the best half as

regards concentration volatility, churn and the cost disadvantage ratio. The sector is very small (£64 million).

Gambling and betting

- 1.101 This sector is in the worst 10% in terms of the cost disadvantage ratio, and the worst quartile as regards concentration and profitability. There are no recorded imports and the sector is very large (market size £21.1 billion). On the other hand, the sector performs relatively well as regards productivity growth (whichever measure is used) and churn, where it is in the top half.

Retail sale of medical and orthopaedic goods

- 1.102 This sector is in the worst quartile as regards profitability and cost disadvantage ratio, and the worst half on concentration, churn and productivity growth (whichever measure is used). There are no recorded imports. On the other hand, concentration volatility is relatively high (top half of sectors) and the sector is small (market size £322 million).

Manufacture of other machine tools not elsewhere classified

- 1.103 The sector is in the worst quartile on churn and productivity growth (however measured), and the worst half as regards concentration, profitability and concentration volatility. There are no recorded imports. On the other hand, it performs well as regards the cost disadvantage ratio (best 10%). A possible difficulty is that the category is an eclectic one.

Repair of electrical household goods

- 1.104 The repair of electrical household goods is the single most profitable sector. It is in the worst 10% as regards productivity growth (whichever measure used), in the worst half on concentration and concentration volatility and there are no recorded imports. On the other hand, it is among the best half in terms of churn and the cost disadvantage ratio, which provides some evidence that barriers to entry may be low. In addition, the sector is small (£332 million).

Wholesale of sugar and chocolate and sugar confectionary

- 1.105 This sector is among the 5% most profitable. Concentration is in the worst quartile and the cost disadvantage ratio is the worst half. There are no recorded imports. However, it is in the best half of sectors as regards churn, concentration volatility and productivity growth (whichever measure used).

Complaints

- 1.106 In so far as possible, the complaints data was organised using the OFT's own 71 category classification scheme.

Home maintenance, repairs and improvements

- 1.107 This sector is the single most complained about in terms of the adjusted trading standards data. It also performed poorly on the other indicators of consumer complaints, being among the worst 25% of sectors as regards number of complaints received by *Watchdog*, complaints' websites, and complaints to the ASA and ITC. The sector is very large (£28.3 billion).

Electricity

- 1.108 This sector is large (£7.3 billion) and received the second highest number of complaints on the adjusted trading standards data. This is attributable to the large volumes of complaints received by EnergyWatch. However, it did not feature in worst half of sectors in regard to complaints' websites or complaints to the ASA and ITC.

Second-hand motor vehicles

- 1.109 This was the third most complained about sector from the adjusted trading standards data. It was also in the worst half of sectors as in terms of complaints to the ASA and ITC. The sector is very large (£18.3 billion). On the other hand, the sector did not generate a significant number of complaints to complaints' websites.

Telecommunications excluding mobile phones

- 1.110 This sector was the fourth worst on the adjusted trading standards data. It also generated a significant number of complaints to complaints' websites. However, it did not feature in worst half of sectors in regard to complaints to the ASA and ITC.
- 1.111 A difficulty which arises here is the breadth of this sector. Without more detailed information on the particular telecommunications products and services that are being complained about it would be difficult to focus an investigation.

Mobile phones and services

- 1.112 The sector was the fifth most complained about on adjusted trading standards data. However, it did not feature in worst half in regard to complaints to the ASA and ITC, nor did it feature significantly among complaints to complaints' websites.
- 1.113 Although this sector is less broad than telecommunications excluding mobiles, it may still be difficult to focus an investigation without further information about what features of the industry are generating the poor complaints record.

Advertising

- 1.114 The three UK sectors with the highest advertising to sales ratio are listed below.

Denture fixatives

- 1.115 Although this sector has the highest advertising to sales ratio of any in the economy, it is very small (£18 million).

Bleaches and lavatory cleaners

- 1.116 The sector with the second highest advertising to sales ratio is also very small (£41 million).

Shampoo

- 1.117 Of the three sectors with the highest advertising to sales ratio, the only one of significant size is shampoo, although even this is still relatively small (£274 million). It may be recalled that of the two of the nine products found in the AC Nielsen (2000) study to be significantly more expensive in the UK than in peer countries were 'Pantene Pro V 200ml equivalent', 'Shampoo 250ml equivalent'.

Innovation

- 1.118 Listed below are the three sectors which perform worst on the selected innovation indicator. Recall that this was RandD to sales ratios in a given sector compared with peer countries (France, Germany, Italy, Japan and the US).

Office accounting and computing machinery

- 1.119 An issue that arises here is the extent to which the relevant geographic frame is to consider expenditure on RandD within the UK. A relative lack of innovation in this sector in the UK would not necessarily have a damaging effect on UK consumers if innovations made by companies based outside the UK are available here.

Rubber and plastics products

- 1.120 Again the issue arises as to whether the relevant geographic frame to consider is the UK since the relevant question is the impact on UK consumers.

Construction

- 1.121 This sector is very large (£115 billion). A difficulty here is that the sector is rather aggregated. It would therefore be useful to have more disaggregated data in any further examination of why RandD spending in the UK lags behind peers in this sector.

Conclusion

- 1.122 The project identified and populated 32 indicators potentially relevant to how well markets are working for consumers. We have used 11 of these indicators in the top-down empirical tool for the identification of markets.
- 1.123 Two different combination methodologies were described: the results of applying these methodologies are shown in Table 1.12 and Table 1.14. Focussing on the second methodology, we then provided brief descriptions of the 26 sectors selected by means of this approach. We emphasise that the results of this approach are sensitive to the weights applied to the indicators, and that these are partly a matter of policy.
- 1.124 We are fully aware of the limitations of this top-down procedure: some of the main problems with the tool are described in section 0. It is clear that bottom up search techniques are needed as a complement to, and possibly substitute for, this top-down procedure.

ANNEXE

Indicator	Data Source	Industry classification scheme	Comments	
Barriers to Entry				
1	Advertising-to-sales ratio (2001)	Advertising Statistics Yearbook (2003)	Advertising Agency's own built on AC Nielsen's product category level	Comanor and Wilson (1967) find the advertising to sales ratio is consistently and significantly an explanatory variable for profitability. <i>Problems:</i> uses non-SIC classification scheme
2	RandD expenditure-to-sales ratio (2000)	STAN/ANBERD	4-digit ISIC Rev. 3 for manufacturing; 2-digit for non-manufacturing	<i>Problems:</i> High degree of aggregation.
3	(Average firm turnover of the largest firms accounting for the first 50% of total industry turnover)/(Total industry turnover)	FAME	4-digit UK SIC (2003)	Intended to capture economies of scale. However, as Davies (1980) has pointed out, it suffers from being in effect a measure of concentration.
4	'Cost Disadvantage Ratio' = (Value added per worker in the smallest firms accounting for 50% of total industry turnover)/(Value added per worker in the largest firms accounting for 50% of total industry turnover)	FAME	4-digit UK SIC (2003)	Intended to capture economies of scale. This measure is based on Caves et al. (1975) who examine the ratio: (value added per worker in the smallest plants accounting for 50% of output)/(value added per worker in the largest plants accounting for 50% of output).

Indicator	Data Source	Industry classification scheme	Comments	
5	Churn of UK businesses in 2001. Churn is defined as entrants plus exitors divided by the existing number of firms.	Annual Business Inquiry respondents database; Small Business Service (DTI)	2-digit UK SIC (1992) (for ABI); 3-digit UK SIC (2003) for Small Business Service	Suggested by Disney, Haskel and Heden (2003a) who used the Annual Business Inquiry (ABI) database (2-digit SIC). We have used Small Business Service data to populate this indicator at the 3-digit level. <i>Problems:</i> Even at the 3-digit level rather aggregated.
6	Tangible assets divided by firm turnover. Average for period 1998-2002	FAME	4-digit UK SIC (2003)	This measure of capital intensity has been used to explain industry profitability by Shepherd (1972) and Domowitz, Hubbard and Petersen (1986). The underlying theory is that entrants have worse access to capital than existing players. <i>Problems:</i> The definition of capital stock used in companies' accounts is subject to differences in accounting measurement.
Productivity				
7	UK Labour productivity growth (value added per employee), 1998-2002	FAME	4-digit UK SIC (2003)	Labour productivity growth has been found to be well correlated with TFP growth. In turn, TFP growth has been found to be greatest in competitive markets by Nickell (1996) for example.
8	UK Labour Productivity dispersion growth, 1998-2002	FAME	4-digit UK SIC (2003)	Disney et al. (2003b) suggest that in competitive markets the least efficient plants leave so that productivity dispersion should not persist.

Indicator	Data Source	Industry classification scheme	Comments	
9	Average UK TFP levels for 1998-2002	FAME	4-digit UK SIC (2003)	TFP levels have been linked with competitive market conditions by, for example, Nickell (1996).
10	Percentage growth in TFP, 1998-2002	FAME	4-digit UK SIC (2003)	Nickell (1996) found that the link between TFP growth (this indicator) and competition was particularly strong.
11	TFP dispersion growth, 1998-2002	FAME	4-digit UK SIC (2003)	Disney et al. (2003b) suggest that in competitive markets the least efficient plants leave so that productivity dispersion should not persist.
Concentration				
12	Average C3 ratio 1998-2003	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC (1992)	<i>Problems:</i> Data is on production rather than consumption. Turnover is allocated to primary SIC code of the firm.
13	Average C5 ratio 1998-2003	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC (1992)	As above
14	Increase in C3 ratio 1998-2002	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC (1992)	As above
15	Increase in C3 ratio 2000-2002	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC (1992)	As above
16	Coefficient of variation of C3 1998-2002	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC (1992)	As above
17	Average HHI 1998-2002	FAME	4-digit UK SIC (2003)	<i>Problems:</i> Parents and subsidiaries are listed in the same field in database leading to a problem of double-counting. Data is on production rather than consumption. Turnover is allocated to primary SIC code of the firm.

	Indicator	Data Source	Industry classification scheme	Comments
18	Market Share Volatility 1998-2002 defined as the average (across years and firms) percentage point change	FAME	4-digit UK SIC (2003)	As above
19	Coefficient of Variation of the Market Leader's share	FAME	4-digit UK SIC (2003)	As above
20	UK Market Share Volatility 1994-2002	FAME	4-digit UK SIC (2003)	As above
Profitability				
21	Average difference between ROCE and cost of capital within a 4-digit SIC code	FAME	4-digit UK SIC (2003)	<i>Problems:</i> Highly profitable relevant markets may be missed through averaging across firms. Difficulties in measurement of economic capital mean results need to be interpreted with caution.
Prices				
22	UK retail prices of selected consumer goods compared with France, Germany and the US	AC Nielsen, February 2000 study for DTI	AC Nielsen's own	International price comparison conducted at a single point in time (November- December 1999). <i>Problems:</i> limited selection of products; comparison based on 'snapshot'.
23	Trends in producer prices 1991-2002	ONS Producer Price Indices	ONS alphabetic code, based on UK SIC (92)	Price trends without cost data relatively uninformative.

Indicator	Data Source	Industry classification scheme	Comments	
Consumer Complaints				
24	Complaints received by Trade Standards Departments, 1999 to 2004	OFT Trends	OFT's 71 category classification scheme	The most comprehensive source on consumer complaints. <i>Problems:</i> No measure of value lost to the consumer or indication of whether complaints upheld. No regional differentiation.
25	Consumer Complaints received by BBC's Watchdog	Watchdog website	OFT's 71 category classification scheme	Provides a source of complaints publicised by Watchdog since September 2003. <i>Problems:</i> Relatively small sample (67 investigations).
26	Complaints received by: Clik2complaints.co.uk, Grumbletext.co.uk, Complaintinfo.com	Relevant Website	Where possible, the OFT's 71 category classification scheme	These websites provide different services: in some cases the company will handle consumers complaints for a fee, in others it merely provides a forum for posting complaints. The data from the websites has been assembled into the OFT's 71 category classification scheme. <i>Problems:</i> Relatively small samples of complaints lodged at each website.
27	Complaints received by the ASA and ITC	Websites of ASA and ITC	Various sectoral classification schemes	These are further important sources for consumer complaints. Where possible we have aggregated into the OFT's 71 category classification scheme

Indicator	Data Source	Industry classification scheme	Comments	
Innovation				
28	Average ratio of UK RandD expenditure to that in peer countries	STAN/ANBERD	4-digit ISIC Rev. 3 for manufacturing; 2-digit for non-manufacturing	<i>Problems:</i> High degree of aggregation.
Switching Costs				
29	Proportion of customers switching in the Period 1995-2000	DTI study 'Switching Suppliers'	Six selected industries	<i>Problems:</i> Severely limited industry coverage: also the measure is theoretically questionable.
Other				
30	Average import penetration (imports to production ratio), 1998-2002	UKTradeinfo, Trade and Industry MQ10 (ONS) and Annual Business Inquiry (ONS)	UKTradeinfo uses CN/SITC, while ABI uses UK SIC (1992)	The matching of the ONS production and import data is imperfect.
31	Market growth (average annual growth in UK production from 1998 to 2002)	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC	Based on UK production data.
32	Market size	Annual Business Inquiry (ONS)	2 to 5 digit UK SIC	Based on UK production data.