

11 Price analyses and histories

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Introduction

11.1. Drawing on evidence from both suppliers and retailers, the previous chapter set out the main influences on the pricing of the four reference white goods, and in particular the various suppliers' practices associated with establishing and promulgating RRP. In this chapter we explain the pricing analyses we carried out, where the primary focus was on the relationship between suppliers' RRP and retail prices, ie the prices offered by retailers (advertised and displayed prices) and the prices actually paid by consumers in retail shops (transaction prices).

11.2. We start, in paragraphs 11.4 to 11.33, by explaining in some detail the main characteristics of the pricing data obtained and the nature of our analyses, which were largely the same for all four goods. We then consider, in separate sections, the data applying to each of the reference white goods-washing machines, tumble driers, dishwashers and CFS products. More particularly, for each of the four products, we provide details and explain the main features of the price distributions obtained from a sample of 12 individual models (washing machines, for example, are considered in paragraphs 11.34 to 11.43). For three of these models, we also outline what we have called price histories, which include details of RRP over the life of these particular models. We have used comparable data and the same form of analysis for each of the four goods, in recognition of the fact that we have four separate references.

11.3. The RRP referred to in this chapter are those applying to sales through retail outlets; MORP are the subject of separate examination (see paragraphs 10.73 to 10.92). The nature of the products, consumer demand, structural characteristics in both supply and retailing, and also the evidence on price trends are

considered in Chapter 7. The views and comments of suppliers and retailers are summarized in Chapters 13 and 14 respectively; comments relating to our pricing analyses are included in this chapter.

RRPs and consumer prices

The pricing data

11.4. Our analyses of retail prices for the reference goods and of their relationship with suppliers' RRP has been based on data provided by GfK. The data consist mostly of transaction prices, ie the net price paid by customers at the point of sale, rather than retailers' advertised or displayed prices. As explained below, these data are derived from EPOS systems used by the larger retailers. For small retailers, the data used are ticket prices observed in the store. In subsequent sections of this chapter, the price information collected is considered separately for each of the reference white goods. In each case, the data are presented in the form of summary tables and also in bar chart or diagrammatic form (in Figures 1 to 48 of Appendix 11.1); each chart indicates the volume of sales within given £5 price bands for a particular model and the main features of the price distribution.

11.5. Before undertaking this analysis, we considered the use of various types and sources of pricing information, including those available from market research companies. Some sources (for example, Beyen (UK) Ltd) rely on advertised prices and the model coverage is often restricted, whilst others (for example, IFR (UK) Ltd) are based on retailers' displayed prices, with the data being collected for a limited number of models through a small sample of retailers. We chose to use GfK as our source because, whilst not ideal in all respects, the data best suited our purposes and were also widely used and well regarded by suppliers themselves. The GfK data are also the most comprehensive available, in that they include virtually all the different models of reference white goods on sale within the UK market, with sales volumes and prices pertaining to individual models.

11.6. The GfK retailer base includes virtually all the major retailers and mail order companies operating within Great Britain (data are not collected in Northern Ireland). For these retailers, the pricing data assembled are based on actual transaction prices for each model, as recorded by the retailers themselves on their EPOS systems, though for each individual store they are passed over to GfK on a weekly average basis (the prices for individual models are calculated as total weekly sales revenues, divided by the total weekly number of sales, with both sets of figures being net of returned goods). At Appendix 11.2, we list all the retailers which, we understand, provided EPOS data on the reference goods to GfK during the sample period (February/March 1995); it follows that of the four retailers/groups of retailers for which we obtained separate sales data (see Tables 11.2, 11.6, 11.10 and 11.14), the first three recorded sales through EPOS, whilst for the fourth ('other retailers') this was partially the case (see paragraph 11.8).

11.7. The EPOS price observations based on these data include and reflect sales where customers had negotiated a discount off the retailer's displayed price ('in-store' negotiated discounts); sales made at a staff discount (where the discount given is often about 10 per cent, we were told); sales of ex-display and damaged or repaired goods; as well as sales of end-of-line products (see paragraphs 11.16 to 11.25 and 11.28 for further explanation). The consequences of the inclusion of these sales in the weekly averaged data are considered below in paragraphs 11.26 and 11.27.

11.8. As mentioned in paragraph 11.6, some of the figures relating to 'other retailers' (typically department stores such as JLP and multiple retailers such as MFI and Iceland) are based on EPOS data in the same way as for the major retailers. For the smaller retailers without EPOS systems, GfK's data are collected from a representative panel of about 440 retailers (including kitchen specialists), of which 330 sold reference white goods. These data are derived from GfK's monthly manual audit of retailers' displayed prices and sales volumes estimated by GfK from retailer information on deliveries and changes in stocks. The data collected are grossed up by GfK using a series of weighting factors in order to estimate figures for the 'other retailers' sector as a whole, of which these non-EPOS retailers account for the major part. Because they are based on displayed prices, these data do not include sales made at other prices (for example, those made at staff discounts, or at prices reduced as a result of bargaining, or sales of ex-display and damaged or repaired goods).

The sample period, models chosen and RRP data

11.9. The time-span chosen for our pricing study was the five-week period between 19 February and 25 March 1995. In terms of general timing, this was considered to be a suitable period, largely because it was close but prior to the start of our inquiry and outside retailers' traditional sales periods (January and July). It was also consistent with GfK's usual data collection periods, which was a necessary condition because we had to rely on figures already obtained by GfK for its own commercial purposes. Taking a longer period for the study would have offered some advantage through covering a larger proportion of total market sales. Against that, however, it would have been likely to exacerbate the difficulties associated with model changes, product obsolescence and changes in RRPs during the period, difficulties which we consider further below. In any event, we augmented our analysis of retail prices with separate analyses of what we have termed the price histories of selected models (see, for example, paragraphs 11.44 to 11.51 on washing machines).

11.10. The product sample used was initially aimed at the top three best-selling models of each of the top four suppliers of each of the reference white goods (based on GfK data on total sales). It seemed to us that there was merit in concentrating on models which were most popular with consumers, though retailers' own-label products-which are also popular to an extent, except for dishwashers-were excluded because suppliers' RRPs do not apply. The models covered were also intended to be fully current models and not subject to changes in RRPs during the sample period (February/March 1995). In a few instances, the models initially selected did not satisfy these criteria and were replaced with others. In the event, however, some models of reference white goods included in the final sample proved to be either subject to changes in RRPs during the sample period, or less commonly, were at the end of their product lives and about to be replaced. Nevertheless, in order to maintain the focus of the study on best-selling models, we decided not to make further changes, but have explained in the summary tables which models were affected by either product obsolescence or other special factors, and how we treated the data where RRPs changed during the sample period.

11.11. The fact that we aimed only to use best-selling models was criticized¹ by a few suppliers on the grounds that the retail prices for such models were likely to be highly visible and well known to both consumers and retailers and that, as a result, they would not be expected to vary much between different retailers. On the other hand, it could be argued that if prices were indeed well known, price discounters might be encouraged to be particularly active, because they would be more likely to attract customers to their stores and increase their sales. In practice, and reflecting both the initial model selection process and the above exclusions, some of the models in our sample went beyond simply the top 12 best sellers (the Hotpoint DF41 dishwasher, for example, was the 28th best-selling model of dishwasher).

11.12. Information on the RRPs which were current during the sample period was provided by the relevant suppliers of reference white goods, which in practice (as explained in paragraph 10.16) often use different terms, typically `SRP' (Suggested Retail Price) or `MRP' (Manufacturer Recommended Price). In many cases, the suppliers also set or issue two different RRPs for the same model, that is:

- (a) a higher nominal RRP (our term), which some suppliers told us was used as a guide for customers as to its relative price position within a supplier's model range and appears, in practice, to be commonly used both by retailers and suppliers primarily for promotional purposes; and
- (b) a lower effective RRP (our term), which is the retail price actually being recommended by the supplier.

For all models in our analysis, we use `the RRP' to mean the latter `effective' RRP (unless otherwise indicated), ie the retail selling price effectively recommended or suggested by the supplier during the sample period.

11.13. In some instances, the RRP may be permanently reduced at some point during the life of the product, in order to reposition the product and increase its competitiveness. More commonly, however, the RRP may often be a supplier's `promotional' price or temporary, special offer price (see Table 11.1, for example, with regard to the Zanussi washing machines included). Such promotional prices may in some

¹We were also criticized by some suppliers for seeking to include only models which had no changes to their RRPs during the sample period, since changes to RRPs, it was claimed, are typical of the markets we were investigating. In practice, the RRPs of some of the models selected did change during the sample period.

instances be shown on suppliers' general price lists (see Appendix 10.1) as a reduced RRP. In other cases retailers may be informed separately, for example by suppliers' sales representatives (see Chapter 10). Indeed, CDA told us that it does not use a general price list, because it negotiates buying terms and likely retail selling prices separately with each of its major customers.

11.14. Retailers themselves may refer to suppliers' RRPs on their point-of-sale material or in advertisements. As stated in the previous chapter (see paragraph 10.29), however, many of the larger retailers, including Dixons, Comet and JLP, do not mention RRPs on their point-of-sale price tickets, though Dixons and Comet agreed that in practice their ticket prices often coincided with suppliers' RRPs.

Price distributions

11.15. Figures 1 to 48 in Appendix 11.1 show the observed retail price distributions for the models in our sample of each of the reference white goods. The bar charts indicate the number of observations within £5 bands, where each band is designated by the lower bound. For example, the £295 band includes all price observations between £295.00 and £299.99.¹ The data include sales by all retailers other than mail order companies and Rumbelows, which withdrew from the market during the sample period. Mail order companies were omitted because suppliers often indicate different (and usually higher) RRPs for sales through mail order; we have carried out a separate study of this sector (see paragraph 11.3). In the case of Rumbelows—the third largest multiple retailer—we were advised that Rumbelow's pricing data just prior to its withdrawal might have been less than fully reliable. Moreover, its pricing behaviour was likely to have been influenced by its imminent closure though any indirect effects with respect to intensifying high street competition, and thus on the prices charged by other retailers, are reflected in the data. (As mentioned in paragraph 9.24, the intended closure of Rumbelows was announced on 7 February 1995. Branch closures began soon afterwards and continued until 31 March 1995.)

11.16. The price distributions show a range of prices around RRPs, though typically there are more observations below than above RRPs. The observations below RRPs include sales where the retailer's display price was lower than the RRP (possibly as a result of an explicit discount from the RRP) and also, for the EPOS-based data, where there were in-store, one-off discounts. These may arise for a number of reasons, for example as a result of a retailer price matching other local retailers at the request of would-be buyers; or because the buyer haggled with the retailer on other grounds and successfully bargained down the price.

11.17. Some suppliers (for example, GDA) claimed that the granting of such discounts was widespread, particularly among the smaller retailers. A market research report commissioned by GDA in 1993, for example (which concerned washing machines, dishwashers and CFS products—see paragraph 7.13), found that 69 per cent of consumers across all retailers (but 85 per cent of those shopping at small stores) who stated that they had asked for a discount said they got one. However, it also showed that only about 15 per cent of consumers (17 per cent in the case of small retailers) attempted to haggle for a discount (the success rate was significantly greater in northern areas than in the south). Moreover, the evidence from major retailers appears to suggest that such in-store, negotiated discounts are in practice not common for individual product purchases, and together with other types of discounts amounted to 1 to 2 per cent of total sales revenue (see paragraph 11.25(b)). The GDA-commissioned survey suggested that the proportion of customers seeking discounts from small retailers (17 per cent) was not greatly different from those seeking discounts from the multiples.

11.18. Verdict Research also commented on consumer haggling and the granting of in-store discounts, and told us that, in its own experience, such activity was on such a small scale as to be relatively irrelevant. Similarly, CA told us that its own price surveys indicated that prices for reference white goods varied little between retailers. CA's price surveys in *Which?*, May 1995 and June 1996, included reference to four models of washing machine. Again, prices were virtually identical among the major electrical retailers (differing by only £10 in one instance), and prices collected from small retailers and department stores showed notable uniformity. In addition, CA collected price information on a large number of dishwasher models for a 'best buy' evaluation (published in the December 1996 issue of *Which?*). Prices for 15 models were included in the report and information on other models was made available to us by CA. We note that the prices quoted in

¹RRPs and retailers' displayed prices are, in practice, almost always at so-called 'price points' (see Glossary) ending in £9.99, or occasionally £4.99, so it is likely that most price observations in, say, the £295 band will be at £299.99.

CA's surveys appeared to be at RRP for the washing machine models covered and also for the four dishwashers for which we had the relevant information. CA added that, although offers by retailers to price-match others were common, its evidence suggested that consumers tended to pay the displayed (ticket) price and generally did not haggle with retailers for additional, in-store discounts.

11.19. Price competition may also take the form of a discount on multiple or combined purchases of the reference white goods. By way of example, retailers may offer (or be willing to grant) a discount, reflecting the relatively high value of sales involved, for combined (or package) purchases, particularly for a washing machine combined with a tumble drier, or perhaps a refrigerator together with a freezer. Where the package includes products from different suppliers, any such discount is likely to reflect retailer-initiated price competition.

11.20. Where the goods are those from a single supplier, however, the discount offered may be, and often is, initiated and determined by the supplier. In these cases, the after-discount offer price is essentially the supplier's RRP for the combined package and the offer is therefore likely to be available in all retail outlets stocking the relevant ranges.

11.21. In the GfK data based on EPOS, some of the sales of individual products (for example, washing machines) will reflect the discounts provided on such package sales, though it is not possible to determine how the discount has been apportioned by the retailer to each of the products concerned. For example, when the price of the package deal is entered into the till, there are three main ways in which the sale may be recorded:

- (a) it may be entered as a single purchase of a high-priced washing machine (or tumble drier), giving rise to a high-price outlier in the distribution (for example, a washing machine apparently sold at £100 or more above the RRP);
- (b) the reduction in cost for the two products may have been allocated to just one of them, resulting in a low-price outlier (for example, £50 or more below the RRP); or
- (c) the discount may be divided (evenly or otherwise) between the two products.

In each case, the effect is to create additional errors, or at any rate 'noise', in the price distribution data.

11.22. Suppliers sometimes offer discounts from the RRP by means of 'trade-in' payments for old appliances. The discount is sometimes given to the consumer by the retailer (who is reimbursed by the supplier) and sometimes by the supplier. In the former case, we understand that the reduced price is normally recorded by the retailer through his EPOS system and hence will be picked up in our price observations derived from EPOS data. When the discount concerned is paid by the supplier, however, the reduced price will not be captured by our price observations. We were told that for discounts under £30 a significant number of consumers did not in practice (for whatever reason) submit a claim to the supplier.

11.23. Fully exclusive models of the reference white goods were omitted from our sample, but in some instances one or perhaps several of the largest retailers (Dixons, Comet and the RECs) accounted for a major proportion of total sales of a particular model, ie the product was 'semi-exclusive' to those retailers. In these cases, the retail price may have reflected reduced net buying prices negotiated with the suppliers, and these retail prices will have largely determined the observed price distribution, particularly as such retailers generally aim to charge a uniform price for given models in each of their stores (see paragraph 10.50).

11.24. Dixons and Comet sometimes selectively adjust prices either locally (special offers in individual shops) or in particular regions (see paragraphs 10.54 to 10.57). The price reduction is sometimes implemented by means of so-called 'voucher' promotions; in exchange for vouchers (or coupons) cut out from press advertisements (they can also sometimes be collected on entering the store), purchasers claim a lump sum off the ticket price. Voucher promotions may also be undertaken nationally; they typically run for limited periods, for example bank holiday weekends. The purpose is often to clear stocks of particular goods or to match competitors' prices. Voucher schemes may be partly or wholly supplier-funded. We understand that the reduced price arising from voucher sales is normally recorded by retailers through their EPOS systems, where used, and hence will be included as reduced prices in our price observations derived from EPOS data.

11.25. There are a number of other reasons, not associated with price competition, why observed retail transaction prices may be below the RRP. In most cases it is not possible to quantify with any degree of

accuracy either their frequency or impact on the price distributions for our product sample, but where possible we explain in our four pricing analyses any special features (product obsolescence, staff discounts, etc) which are known to have affected the data. The main reasons include the following:

- (a) *Staff discounts.* It is common practice for retailers to offer discounts to their own staff, often, we were told, of about 10 per cent. Comet told us that over 50,000 staff of businesses in its parent company group (Kingfisher) were eligible for such discounts on purchases from Comet stores for themselves or their immediate families. The total cost of such staff discounts amounted to approximately 0.2 per cent of sales. Dixons advised us that 5 per cent of sales by value for electrical goods as a whole would be subject to such discounts. Beyond that, and apart from a few particular instances (see paragraph 11.74), no detailed information was available. More generally, some evidence from major retailers-see (b) below-suggests that, for the market as a whole, the direct effects may be rather modest. That leaves open the possibility that the effects on individual models may be more significant.
- (b) *Ex-display and damaged (or repaired) goods.* Again, it has not been possible to quantify accurately the prevalence or impact of such discounts, though we were told by some of the major retailers that, for the market as a whole, the direct effects were likely to be modest (see paragraph 10.105). Several major retailers told us, for example, that discounts to staff, discounts on displayed or damaged (or repaired) goods, and any in-store negotiated discounts taken all together amounted to only 1 to 2 per cent of their total sales revenue from the sale of electrical goods though the discount given on individual items was likely to be higher.
- (c) *Product obsolescence or end-of-line sales.* In some cases, the supplier may, at the end of a product's life, negotiate a special deal with one or several of the major retailers, thereby facilitating sales at prices below the previously prevailing RRP, in order to clear stocks before the introduction of a replacement model. In practice, our sample data were, we believe, not greatly affected, except for a few models.
- (d) *Supplier-initiated price promotions prior to the sample period.* In some cases there may have been supplier promotions just before the sample period. Such promotions may have given rise to spill-over effects into the sample period, either because of unsold stocks purchased at the lower price or because of the effects of returned goods (see (e) below).
- (e) *Returned goods.* In some cases, goods may be returned to the retailer several weeks after purchase, possibly in exchange for other products. Where returned goods recorded in our sample data were originally purchased at a price which was different from that prevailing during the sample period, they may have distorted the calculation of implied average prices (potentially either upwards or downwards) because of the weekly aggregation of sales net of returns (see paragraphs 11.26 and 11.27).
- (f) *Ancillary offers and purchases.* Some suppliers claimed that concentrating on transaction prices to the exclusion of ancillary offers such as interest-free credit, free delivery, and free extended warranties could lead to biased results. Hence, if a free extended warranty were to be provided on the sale of a washing machine, for example, the 'real' price to the consumer would be the recorded transaction price (or the displayed price in the case of non-EPOS data) less the value or price of the warranty. Moreover, if a price discount were given on a particular sale of, say, a dishwasher, and the customer also made an ancillary purchase (for example, cleaning fluid or powder, or some unrelated product), and these were then 'bundled together' in the recorded transaction price in the EPOS data, the 'real' price would be overstated and might be nearer to the RRP than appeared to be the case from the EPOS data. On this second point, GfK assured us that it made every effort to ensure that the price information received from retailers was not bundled in this manner, and believed that the EPOS data was largely free of such distortions. Possible exceptions are considered in paragraph 11.28.
- (g) *Data recording and GfK estimation errors.* Although we believe recording errors to be minimal, no doubt there are some instances where either the retailer entered the wrong price (either too low or too high), or the GfK audit prices (see paragraph 11.8) were inaccurate. In addition, the grossing up of data on small retailers by GfK may have introduced a degree of sampling error in the price distributions (by assuming that other retailers' sales behave the same as those of the GfK panel). Furthermore, during our evaluation of the data, we identified and subsequently corrected a number of inaccuracies in

the figures provided to us by GfK. In general, by applying intensive checking procedures, every effort was made by both GfK and us to ensure that the data finally used were sound.

11.26. The above factors may give rise to individual price observations below RRP in the price distributions, for reasons other than retail price competition. In addition, however, the weekly averaging of the major retailers' data may compound the effects because, as mentioned earlier (see paragraph 11.7), it is likely to increase the proportion of price observations recorded as being below the RRP. This may occur where there are multiple sales of a particular model at a given store during a reporting week, as may often be the case for best-selling models (provided also that at least some sales of the model in that store are made at different prices). By way of a simplified example, if four sales were made during the week, three of which were at the RRP and one at, say, 10 per cent below the RRP (for whatever reason), the data would record all four sales as having been at a price which was the arithmetic mean (the average) of the actual prices, and this figure could well be below the £5 band which included the RRP. Thus, if the critical question were whether or not the retailer in question sold the good at the RRP, three of the four observations would be incorrect, and the number of observations attributed to the RRP value band would therefore be understated. If, on the other hand, the averaging involved, say, 20 sales (in a given store) at the RRP and only one at a slightly lower price, it is likely that all of them would be shown to be within the RRP band.

11.27. For any individual model, the effects of averaging on the distribution of recorded prices in our EPOS data will depend on the volume of sales in a given week for each store, and the frequency and size of any discounts. To explore the issue in more detail, we undertook a series of simulations using various alternative assumptions about these factors. The results suggested that the general effect in the bar charts in Appendix 11.1 is likely to have been in the direction of a modest reduction in the dispersion of prices. It is also likely, however, that depending on the circumstances applying to particular models, some of the modal values will have been shifted to the left, away from the RRP, and the proportion of observations recorded as being within 5 per cent of the RRP will have been reduced.

11.28. There are also some, albeit far fewer, examples of prices being above the RRP, and in some cases they are substantially above. We understand that some of the more extreme outliers may reflect various factors, including the cost of extended warranties¹ having been included in the transaction price; the manner in which 'trade-in' promotions were recorded; the effects of package sales (see above); or possibly also the effects of returned goods on recorded prices. Less extreme observations above the RRP may reflect retailers choosing to price above the current RRP where perhaps local competition is muted (some retailers told us that they did this occasionally); or the inclusion of 'extras' such as delivery or installation charges, and of accessories and other goods in the price recorded on the EPOS data. In some cases they may, as explained above, simply reflect data errors. Some suppliers (and also major retailers) expressed a degree of surprise that retailers had charged prices higher than the RRP, since suppliers generally regard and intend their RRP to be a maximum retail price.

Statistical parameters

11.29. In considering the relationship between retail transaction prices and RRP, we have examined the modal (most frequent) price charged for any given model, the proportion of sales within a given percentage of the RRP and the covar (a measure based on the standard deviation of the distribution which summarizes the spread of prices relative to the mean).

11.30. With regard to the modal value measure, this provides a measure of the central tendency of the distribution, as of course do the mean and median values, in their own way. The latter, however, are influenced by the skewness of the distributions and the existence of both extraneous observations and extreme outliers, whereas the mode is based on a selection of the most commonly observed range. We therefore considered the mode to be more suitable for our purposes. If, for example, retailers were at the time of the sample generally pricing at RRP, it would be likely that the modal value would be either at or close to the RRP for any particular model. Nevertheless, this measure has its own limitations. It may be the case, for

¹Extended warranties may also, in some instances, have the opposite effect. Where retailers give a discount on the warranty, it will usually be recorded by the retailer as a reduction in the price of the product. As long as warranties for electrical goods were taxed more lightly than the goods themselves (the 1997 Finance Act changed the tax position), this procedure reduced the retailer's tax liability.

example, that although the modal price was at the RRP, far more sales took place at a range of prices below the RRP, reflecting retailer competition in the form of reduced prices. This might give rise to either a relatively wide distribution of prices, or a situation where prices are 'clustered' around one or perhaps several prices below the RRP.

11.31. In considering the properties of the distributions, we have used two measures of the spread of prices. The first is the proportion of observations that are close to the effective RRP. More specifically, we have measured for each model in the sample the proportion of price observations within 2 per cent, 5 per cent and 10 per cent of the RRP (as shown in Figures 1 to 48 in Appendix 11.1: in the summary tables, we have used only the 'within 5 per cent' measure). The boundaries of these price ranges were calculated from the RRP itself (to minimize distortion), but where the boundaries fell within a price band (as would commonly be the case), we have included all the observations within that band. In practice, actual prices (though not necessarily weekly averaged prices) are commonly at the top of the relevant price band because, as explained earlier, both RRPs and retailers' display prices are usually at £10 'price points' such as £299.99 or £369.99. It thus appears that the possible distortion of the measure under discussion should not be serious.

11.32. Where two distinct effective RRPs had been quoted (ie because the RRP changed during the sample period, as was not infrequently the case), the percentage of sales indicated as being within 2, 5 or 10 per cent of the RRP represents the number of sales within 2, 5 or 10 per cent of each of the two RRPs added together (excluding overlaps) as a percentage of total sales. In practice, the difference between the two RRPs for a given model was often only £10 (or sometimes £20) on products which often cost more than £300, and any distortion in this measure from combining the RRPs in this way is likely to have been modest. In our sample of washing machines, for example, four models had two RRPs: but for three of them the difference between the RRPs was £10 (see Table 11.1).

11.33. The second measure (of the spread of prices) is the covar, which is the standard deviation of the distribution divided by the arithmetic mean, expressed as a percentage. We adopted this measure of the spread of retail prices in our previous reports on video games¹ and recorded music. The covar measures the degree to which the observations are clustered around the average value. The covars found in our pricing analyses are given in Tables 11.1 (on 12 models of washing machines), 11.5 (tumble driers), 11.9 (dishwashers) and 11.13 (CFS products).

Pricing analysis of washing machines

Price distribution data

11.34. The pricing data used in our study on washing machines (and the other reference white goods) are explained in detail in the section above. The price distributions obtained for the 12 washing machines included in our sample, all big-selling models of the major brands, are shown in the form of bar charts in Figures 1 to 12 in Appendix 11.1. The price data obtained and the statistical parameters are summarized in Table 11.1, and a breakdown of the proportion of sales of each model through different retailers (or groups of retailers)² is provided in Table 11.2. All the models included were free-standing, automatic, front-loading machines; none were washer-driers.

TABLE 11.1 Analysis of pricing data: washing machines

<i>Brand/model</i>	<i>Units sold*</i>	<i>RRP £</i>	<i>Price observations within ± 5% of RRP (%)#</i>	<i>Modal value band~</i>	<i>CovarĐ</i>
<i>Hotpoint WM22đ</i>	13,030	389.99đ	89.6	RRP (£375)	6.1

¹ *Video games: a report on the supply of video games in the UK*, HMSO, Cm 2781, March 1995.

² The figures in Table 11.2 exclude sales through mail order and Rumbelows. Comparable data which include these retailers are given in Table 1 in Appendix 11.3.

		379.99£			
WM12ð	3,668	339.99£	87.2	RRP (£325)	6.2
		329.99£			
WM11	2,638	289.99£	65.8	RRP	4.3
<i>Zanussi</i>					
FJ1093	2,160	499.99£	75.9	RRP	5.6
FL881	1,802	329.99£	84.4	RRP	5.0
<i>AEG</i>					
610/6100ð	1,031	479.99£	79.1	RRP (£475)	5.8
		459.99£			
<i>Indesit</i>					
WN 1196	3,099	N/A	N/A	£290	3.1
WN 855**	2,364	N/A	N/A	£235	14.2
WN 850	1,972	N/A	N/A	£225	4.3
<i>Candy</i>					
AV1000ð##	2,728	339.99	16.9	£295	6.0
		329.99£			
<i>Hoover</i>					
AC 272/74	3,675	349.99	83.6	RRP	4.8
AC 268/70	<u>3,086</u>	299.99£	87.6	RRP	4.2
Total	41,253				

Source: GfK, suppliers and MMC.

*Volume of sales used in the pricing analysis; includes sales by all retailers, but excludes mail order and Rumbelows during the period 19 February to 25 March 1995 (see paragraph 11.15).

#See paragraph 11.31.

~ Value bands are in £5 units designated by the lower bound: the £295 band, for example, includes all price observations between £295.00 and £299.99 (see paragraph 11.15). The modal band indicates where most prices were observed to be (see paragraph 11.30).

ÐThe covar is a measure of the spread of prices, and is calculated as the standard deviation divided by the mean value, expressed as a percentage (see paragraph 11.33).

ðThis model had two RRP's during the sample period as indicated. The percentage of sales shown as being within 5 per cent of the RRP is the aggregate of sales within 5 per cent of each of the RRP's (excluding overlaps) expressed as a percentage of the total number of sales (see paragraph 11.32).

ßThe RRP represents the supplier's promotional price (see paragraph 11.13).

**This model was semi-exclusive to the RECs and special terms were negotiated with MDA (see paragraph 11.39).

##CDA agreed special terms with Dixons and the RECs to sell this model at a retail price of £299.99 (the modal value band)-see paragraphs 11.40 and 11.51.

TABLE 11.2 Washing machines included in the MMC pricing analysis: shares of sales* by retailers

Brand/model						<i>per cent</i>
	<i>Dixons</i>	<i>Comet</i>	<i>RECs</i>	<i>Other retailers#</i>	<i>Residual~</i>	<i>Total</i> ∂
<i>Hotpoint</i>						
WM22	27.2	10.7	22.1	32.9	7.0	100.0
WM12	31.0	2.0	38.4	22.2	5.6	100.0
WM11	22.9	13.5	12.2	44.3	7.2	100.0
<i>Zanussi</i>						
FJ1093	0.0	18.6	37.1	40.6	3.7	100.0
FL881	19.5	7.3	30.7	37.9	4.6	100.0
<i>AEG</i>						
610/6100	27.4	0.0	22.3	46.7	3.6	100.0
<i>Indesit</i>						
WN 1196	0.1	47.9	12.8	30.7	8.5	100.0
WN 855	0.0	0.0	96.4	3.6	0.0	100.0
WN 850	0.5	37.6	35.6	20.0	6.3	100.0
<i>Candy</i>						
AV1000	45.8	0.0	35.2	12.5	6.6	100.0
<i>Hoover</i>						
AC272/74	28.2	8.7	31.7	25.7	5.7	100.0
AC268/70	21.2	6.8	35.4	32.9	3.8	100.0
<i>Weighted averaged</i> ∂	21.5	12.5	31.0	29.0	6.0	100.0

Source: GfK and MMC.

*Volume of sales used in the pricing analysis, covering the period 19 February to 25 March 1995; excludes sales through mail order and Rumbelows (see paragraph 11.15).

#Includes some smaller multiple retailers, department stores and small retailers-see paragraph 11.8.

~ Includes sales which could not be allocated to particular retailers or groups of retailers, together with GfK weighting factors.

∂Rows of percentage shares may not sum exactly to 100 due to rounding.

∂Weighted by the sales volume of each model.

11.35. As shown in Table 11.1, the total volume of sales (and price observations) included in the analysis was just over 40,000. We estimate that these represent around 25 per cent of the total sales of washing machines in the UK during the February/March 1995 sample period (for the full year 1995, total sales were about 1.75 million, at a retail value of £626 million-see Table 7.1).

11.36. The retail price of most popular (big-selling) models is in the range £250 to £550, though some higher specified models can cost significantly more. Within that price range, washer-drier models incorporate a tumble drier facility which may typically add £100 or so to the price. In our sample, the range of RRP's was £300 to £500. As explained in the footnote to paragraph 11.15, RRP's and retail prices are almost always at so-called 'price points' of, for example, £349.99 rather than £350.

11.37. MDA told us that it does not issue or otherwise establish effective RRP's for its Indesit models (but see paragraph 10.17), though it promulgates a form of nominal RRP. All of the nine other (non-Indesit) models had both nominal and effective RRP's (see paragraph 11.12). Of these nine, the effective RRP's of eight models were suppliers' promotional prices during the period. Although the sample period did not overlap with retailers' traditional sales periods (the nearest being January 1995), the effective RRP's for four of these nine models changed during the period, so that each of them is shown in Table 11.1 as having two RRP's. All the 12 models were current products.

11.38. For the six models supplied by the two largest suppliers (GDA and Emaco), the covars were in the range 4.3 to 6.2, and in each case the modal value band was at the RRP (or one of the two RRP's). For these models, the proportions of observations within 5 per cent of the RRP were in the range 66 per cent to 90 per cent. By far the largest-selling model was the Hotpoint WM22 (see Figure 1 in Appendix 11.1). For this model, the modal value was at the lower of its two RRP's, 90 per cent of price observations were within 5 per cent of the RRP's, and the covar was 6.1. Similar results emerged for the two Hoover models.

11.39. For the Indesit WN 1196 and WN 850 models, the covars were relatively low (3.1 and 4.3 respectively), and some 85 to 90 per cent of observations were within 5 per cent of the modal price bands (see also paragraphs 11.48 and 11.49). In the case of the third Indesit model, WN 855, the covar was far higher than the average at 14.2, but this model was subject to special factors in that it was semi-exclusive to three of the RECs (South Western Electricity plc, Powerhouse and ScottishPower), which together accounted for 96 per cent of sales. Each of these companies negotiated individual buying terms with MDA (Indesit). In the event, the price distribution for this model is bi-modal: see Figure 8 in Appendix 11.1. Nearly 30 per cent of observations were within 5 per cent of the £235 modal value band, suggesting a retail price of £239.99.

11.40. In the case of the Candy AV1000 model, the modal value was £30/£40 below the RRP and only 17 per cent of observations were within 5 per cent of the RRP. However, the price observations were clustered around the modal value of £295 (implying a retail selling price of £299.99), with 74 per cent of observations being within 5 per cent of this (see Figure 10 in Appendix 11.1, and the price history analysis in paragraphs 11.50 and 11.51). As shown in Table 11.2, of the sales (and price observations) analysed in our study of price distributions, around 45 per cent went through Dixons, and a further 35 per cent through the RECs. There were none through Comet. Dixons' and the RECs' retail selling prices had been agreed with CDA; the Dixons' price was £299.99.

11.41. As also shown in Table 11.2, six of these best-selling models (the three Hotpoint models, the two Hoover models and the Zanussi FL881) were sold through both of the major retailers (Dixons and Comet) as well as through other outlets, with their respective shares of sales mostly comparable to their overall shares of washing machine sales (see Table 7.7). Five of the other six models, however, were sold through only one of the two major retailers (Dixons or Comet), which were not, therefore, in head-to-head competition with respect to these models, though all of them were also available through others. The AEG 610 model, for example, was sold through Dixons (27 per cent of sales), the RECs and other retailers, but not through Comet (or mail order). The remaining model-the Indesit WN 855-was sold almost exclusively through the RECs.

11.42. We were told by several retailers and suppliers that such occurrences are not uncommon because retailers often seek to stock models which are different from those of their closest competitors. In some cases, the larger retailers may opt to stock either a slightly different and 'semi-exclusive' model from the same supplier or brand, or to stock a comparable model from a different supplier. The Indesit WN 855, for example, was 'semi-exclusive' to the RECs and is a variant of, but essentially the same as, the Indesit WN 850 model which is largely sold through Comet. Sales information provided by GfK for October 1996 indicated that there were over 350 different models of washing machine available in the UK, of which about 80 were exclusive models, accounting for about 14 per cent of sales volumes, and about 15 were own-label products. We consider model and range differentiation further in paragraphs 8.61 and 8.62, and 9.87 to 9.90.

11.43. It was put to us by some suppliers that the inclusion of non-EPOS price data (mostly on sales by small retailers) which therefore related to ticket prices rather than transaction prices, might lead to some distortion of the price distributions (by excluding in-store, negotiated discounts offered by small retailers). In practice, some three-quarters of the data were transaction prices. But in response to these concerns, we undertook a sensitivity analysis based wholly on EPOS data. In practice, this meant excluding from the analysis all the data in the 'other retailers' category (including the EPOS data from department stores and the smaller multiples-about 10 per cent of the total) and also the residuals: together, these data accounted for 35 per cent of the total. The results¹ of this sensitivity analysis were not substantially different from those in Table 11.1.

Price history analysis

¹Modal value bands were largely unchanged from those in Table 11.1. Similarly, the covars were not significantly different from those which include the 'other retailers'. Seven of the covars increased slightly (by an average of 0.7), but the other five decreased by a similar amount (an average of 0.6), and the overall effect was negligible. The proportion of sales within 5 per cent of the RRP for each model also changed, but again, mostly by only a small amount. Of the nine models with effective RRP (ie, excluding Indesit models), the 'within 5 per cent' measure for seven decreased by an average of 5 percentage points, whilst the other two increased by an average of 2.5 percentage points. For details, see Appendix 11.4, Table 1 (and Table 2 for the corresponding information on 'other retailers').

11.44. In order to examine suppliers' pricing policies over the life cycle of washing machines, we carried out a study of the price histories of three of the 12 models of washing machine included in the sample used for our main pricing study, namely the Hotpoint WM11, the Indesit WN 1196 and the Candy AV1000. In selecting these particular models, we took into account the need to examine products from different suppliers, the relative importance of individual models in terms of overall sales, and the nature of the price distribution data and other information available at the time.

11.45. As part of this exercise, we requested information on standard trade prices. It became apparent, however, that for most suppliers standard trade prices are not meaningful because the majority of their sales are through the larger retailers, with whom the suppliers negotiate individual buying terms, often in the form of discounts from RRP—see paragraphs 10.91 to 10.131.

11.46. Details of the pricing information provided by suppliers on two of these models are shown in Tables 11.3 and 11.4. As indicated, we obtained information on the levels of and changes in both nominal and effective RRP over the life of each model. As explained earlier (see paragraph 11.12), suppliers of washing machines (and the other reference white goods) often set or otherwise establish more than one RRP. Suppliers typically set a higher nominal RRP, which is rarely the price charged by retailers, and a lower effective RRP—the retail price actually being recommended—which reflects the supplier's view of the realistic or expected retail price. As a result, when charging the (effective) RRP, retailers are able to show discounts or customer savings from the nominal RRP on their ticket prices.

TABLE 11.3 **Price history: Hotpoint WM11 model**

Introduced: September 1994
 Product life: Beyond 31 March 1996
 Sales ranking:* Third-best-selling washing machine

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i> £	<i>Difference</i>
Initial price	12.9.94	319.99	269.99	50
1st change	30.1.95	319.99	289.99	30
2nd change	6.3.95	329.99	289.99	40
3rd change	1.5.95	329.99	269.99	60
4th change	4.9.95	329.99	279.99	50

Source: GDA.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

TABLE 11.4 **Price history: Candy AV1000 model**

Introduced: May 1992
 Product life: Beyond 1 June 1996
 Sales ranking:* 11th-best-selling washing machine

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i> £	<i>Difference</i>
Initial price	1.5.92	399.99	379.99	20
1st change	1.6.94	389.99	329.99	60
2nd change	1.3.95	389.99	339.99	50
3rd change	1.6.96	389.99	329.99	60

Source: CDA.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

11.47. In the case, for example, of the Hotpoint WM11 (see Table 11.3), the third-best-selling model during the sample period, the RRP was consistently between £30 and £60 below the nominal RRP throughout

the life of the product and was increased or reduced, in each case by £10 or £20, on three occasions, whilst retailers' gross margins, we were told, were held constant. The lowest RRP, and therefore the highest discounts from the nominal RRP, occurred during retailers' traditional sales periods. The RRP in September 1995 was £10 higher than in September 1994. At the time of the pricing study, the modal value for the WM11 was at the RRP, with some 66 per cent of observations within 5 per cent of the RRP, and the covar was 4.3.

11.48. The Indesit WN 1196 model (the tenth-best-selling model during the sample period) was introduced in April 1992 and discontinued in November 1995 (a product life of 43 months). We have not included a table comparable to Tables 11.3 and 11.4 because only rather limited information was available, and MDA also told us that it did not issue or otherwise establish effective RRP for its Indesit models-see paragraph 10.17-though it did so for its Ariston and Scholtès models. For the Indesit brand, it issued what it called an 'SRP' for each model, but in MDA's view this was neither a nominal nor an effective RRP, in the sense in which we have defined these terms. The SRP for this model was £379.99 when it was first launched in April 1992, and it was subsequently increased to £399.99 in February 1993.

11.49. MDA also told us that it negotiated net trade prices and gross margins separately with each of its 50 major customers, rather than applying a standard trade price; MDA provided details of its trade prices for this model to Comet, to CIH and to small retailers not buying through CIH. MDA's trade prices changed (both upwards and downwards) on a number of occasions during the life of the product, and the net price to CIH was some 20 per cent above that for Comet. Comet itself accounted for nearly one-half of the sales of this model during the sample period, whilst sales through Dixons were negligible (see Table 11.2). Comet and Dixons were not, therefore, engaged in head-to-head competition with respect to the WN 1196 model. Comet's net buying price at that time was £[*] (excluding VAT, but before any retrospective rebates or advertising/promotion allowances). It was selling this model at a price of £299.99 (including VAT), implying a gross margin of about [*] per cent before other discounts. At the time of the pricing study, the modal price was at the £290 band, with around 85 per cent of sales being within 5 per cent of that price, and the covar was 3.1.

11.50. The comparable information on the Candy AV1000 model (the 11th-best-selling model during the sample period) is given in Table 11.4. The effective RRP for this model was between £20 and £60 below the nominal RRP throughout the life of the product, and was changed (increased or reduced) on three occasions, whilst retailers' gross margins were held constant. The RRP were lowest, and the discounts from the nominal RRP therefore highest, during retailers' traditional sales periods. The RRP in June 1996 was the same as that applying in June 1994. CDA told us, however, that the RRP were themselves notional, in so far as CDA usually negotiated and agreed trade prices and likely retail selling prices directly with each of its major customers.

11.51. At the time of the pricing study, the modal value for the Candy AV1000 model was in the £295 band (which implies a usual retail price of £299.99), which was £30/£40 below the RRP of £329.99/£339.99. Only 17 per cent of observations fell within 5 per cent of the RRP, though 74 per cent were within 5 per cent of the modal price band. The covar was 6.0. Around 46 per cent of sales were accounted for by Dixons, and a further 34 per cent by the RECs. All were selling at a retail price of £299.99 (the modal value), the price agreed with CDA. The net trade price negotiated with Dixons was £[*] (the RECs' trade price was similar), which allowed it to sell at the agreed price of £299.99 with a gross margin of about [*] per cent before any other discounts.

*Figures omitted. See note on page iv.

Pricing analysis of tumble driers

Price distribution data

11.52. The pricing data used in our study on tumble driers are explained in detail in paragraphs 11.4 to 11.33. The price distributions obtained for the 12 tumble driers included in our sample, all large-selling models of the major brands, are shown in the form of bar charts in Figures 13 to 24 in Appendix 11.1. All those included were free-standing and vented (non-condenser) models. The price data obtained and the statistical parameters are summarized in Table 11.5, and a breakdown of the proportion of sales of each model through different retailers (or groups of retailers)¹ is provided in Table 11.6.

TABLE 11.5 Analysis of pricing data: tumble driers

<i>Brand/model</i>	<i>Units sold*</i>	<i>RRP £</i>	<i>Price observations within ± 5% of RRP (%)#</i>	<i>Modal value band~</i>	<i>CovarĐ</i>
<i>Hotpoint</i>					
TL21	2,140	189.99đ	70.0	RRP	7.9
TL11	1,026	159.99đ	67.7	RRP	7.1
<i>Creda</i>					
37642	1,269	189.99đ	43.0	£175	5.4
37377β	1,099	149.99đ 159.99đ	58.5	RRP (£145)	8.2
<i>White Knight</i>					
CL311W	5,012	109.99đ	24.4	£95	8.4
CL412W	3,392	159.99	1.8	£125	5.7
CL432W	2,670	159.99đ	34.3	£145	8.6
<i>Zanussi</i>					
TD520	1,590	219.99đ	75.3	RRP	5.6
TD62/3	563	139.99đ	82.1	RRP	4.4
TD530	156	259.99đ	80.1	RRP	6.7
<i>Hoover</i>					
D6850/52**	500	N/A	N/A	£195	9.2
D6854/56**	302	N/A	N/A	3245	14.8
Total	19,719				

Source: GfK, suppliers and MMC.

*Volume of sales used in the pricing analysis; includes sales by all retailers, but excludes mail order (and Rumbelows during the period 19 February to 25 March 1995 (see paragraph 11.15)).

#See paragraph 11.31.

~ Value bands are in £5 units designated by the lower bound: the £295 band, for example, includes all price observations between £295.00 and £299.99 (see paragraph 11.15). The modal band indicates where most prices were observed to be (see paragraph 11.30).

ĐThe covar is a measure of the spread of prices, and is calculated as the standard deviation divided by the mean value, expressed as a percentage (see paragraph 11.33).

đThe RRP represents the supplier's promotional price (see paragraph 11.13).

βThis model had two RRP's during the sample period, as indicated. The percentage of sales shown as being within 5 per cent of the RRP is the aggregate of sales within 5 per cent of each of the RRP's (excluding overlaps) expressed as a percentage of the total number of sales (see paragraph 11.32).

**End-of-line product, ie the model was at or close to the end of its product life (see paragraph 11.25 (c)).

¹The figures in Table 11.6 exclude sales through mail order and Rumbelows. Comparable data which include these retailers are given in Table 2 in Appendix 11.3.

TABLE 11.6 Tumble driers included in the MMC pricing study: shares of sales* by retailers

Brand/model						per cent
	Dixons	Comet	RECs	Other retailers#	Residual~	Total δ
<i>Hotpoint</i>						
TL21	16.3	0.4	42.5	37.4	3.4	100.0
TL11	23.7	8.1	14.5	47.8	5.9	100.0
<i>Creda</i>						
37642	0.2	19.7	23.0	53.4	3.7	100.0
37377	16.9	30.3	24.3	20.6	7.9	100.0
<i>White Knight</i>						
CL311W	47.0	0.0	25.2	19.5	8.3	100.0
CL412W	53.1	0.0	31.7	5.1	10.1	100.0
CL432W	34.5	0.0	35.1	23.4	7.0	100.0
<i>Zanussi</i>						
TD520	0.1	17.4	28.9	52.3	1.4	100.0
TD62/3	11.7	35.9	6.9	38.4	7.1	100.0
TD530	3.8	9.0	24.4	62.8	0.0	100.0
<i>Hoover</i>						
D6850/52	29.4	1.2	28.6	36.6	4.2	100.0
D6854/56	6.0	7.3	48.3	37.7	0.7	100.0
Weighted averaged δ	30.9	6.0	29.0	27.5	6.6	100.0

Source: GfK and MMC.

*Volume of sales used in the pricing analysis, covering the period 19 February to 25 March 1995; excludes sales through mail order and Rumbelows (see paragraph 11.15).

#Includes some smaller multiple retailers, department stores and small retailers-see paragraph 11.8.

~ Includes sales which could not be allocated to particular retailers or groups of retailers, together with GfK weighting factors.

δ Rows of percentage shares may not sum exactly to 100 due to rounding.

δ Weighted by the sales volume of each model.

11.53. As shown in Table 11.5, the total volume of sales (and price observations) included in the analysis was just over 19,000. We estimate that these represent around 35 per cent of the total sales of tumble driers in the UK during the February/March 1995 sample period (for the full year 1995, total sales were about 556,000, at a retail value of £92.7 million-see Table 7.1).

11.54. The retail price of most popular (big-selling) models is in the range £100 to £200, though some higher specified models can cost significantly more. In our sample, the range of RRP's was £110 to £260. As explained in the footnote to paragraph 11.15, RRP's and shop prices are almost always at so-called 'price points' of, for example, £159.99 rather than £160.

11.55. The two Hoover models were at the end of their product lives and RRP's were not specified during the sample period. All of the ten other (non-Hoover) models had both nominal and effective RRP's. Of these ten, the effective RRP's of nine models were suppliers' promotional prices during the period. The RRP changed during the period in only one case (the Creda 37377), and this model is therefore shown in the table as having two RRP's. Ten of the 12 models (all the non-Hoover models) were fully current products.

11.56. For three of the four models offered by the largest supplier (GDA), the modal value bands were at the RRP (or one of the two RRP's), the covars were in the range 7.1 to 8.2, and the proportions of observations within 5 per cent of the RRP were in the range 59 to 70 per cent. For the other model, the Creda 37642, the modal value was £10 below the RRP band, the covar was 5.4, and 43 per cent of observations were within 5 per cent of the RRP.

11.57. Crosslee was the second-largest supplier of tumble driers; its White Knight CL311W model (see Figure 17 in Appendix 11.1) was by far the best-selling model in our sample. As explained below, all three White Knight models were sold through Dixons and other retailers, but not through Comet. Two of the three models are subject to a price history analysis-see paragraphs 11.64 to 11.67. The modal value bands for these models were £10 or £30 below the RRP bands and the proportions of sales within 5 per cent of the RRP were low. The covars were 8.4 and 5.7 respectively.

11.58. Emaco was the third-largest supplier of tumble driers. For the three Zanussi models, the modal value band was at the RRP, the proportions of sales within 5 per cent of the RRP were in the range 75 to 82 per cent, and the covars fell in the range 4.4 to 6.7.

11.59. As explained above, the two Hoover models were at the end of their product lives. As a result, RRP's were not specified during the sample period and trade prices to retailers were determined on an *ad hoc* basis in order to clear stocks. For the D6850/52 model, nearly 30 per cent of total sales went through Dixons. The modal price was at the last established RRP (£195 band), and around 67 per cent of sales were within 5 per cent of this price band. The D6854/56 model is subject to a price history analysis-see paragraphs 11.68 and 11.69. Nearly one-half of total sales were handled by the RECs. The modal price was at the RRP (£245 band) set for December 1994, but only around 28 per cent of sales were within 5 per cent of this price band. The distribution is bi-modal, with a significant proportion of sales at the £195 band, which explains why the covar is greater than the average for other tumble drier models in the sample.

11.60. As shown in Table 11.6, five of these best-selling models (one Hotpoint model, one Creda model, two Zanussi models and one Hoover model) were sold through both of the major retailers (Dixons and Comet), as well as through the remaining retailers, with their respective shares of sales being generally comparable to their overall shares of tumble drier sales (see Table 7.7). Almost all the other models, however, were sold through only one of the two major retailers (Dixons or Comet), who were not, therefore, in head-to-head competition with respect to these models, though all of them were also available through other outlets. The three White Knight models, for example, which were the three largest-selling models in our sample, were stocked by Dixons (which accounted for one-quarter to one half of total sales), the RECs and other retailers, but not by Comet. Similarly, the Hotpoint TL21, which was the best-selling GDA model, was sold through Dixons (and others), but not through Comet. We were told by some retailers and suppliers that such occurrences are not uncommon because retailers often seek to stock models which are different from those of their closest competitors. In some cases, the larger retailers may opt to stock either a slightly different and 'semi-exclusive' model from the same supplier or brand, or to stock a comparable model from a different supplier. According to GfK figures for October 1996, there were about 160 different models of tumble drier available in the UK at that time, of which about 40 were exclusive models, accounting for about 14 per cent of sales volumes, and six were retailers' own-label products. We consider model and range differentiation further in paragraphs 8.61 and 8.62, and 9.87 to 9.90.

11.61. It was put to us by some suppliers that the inclusion of non-EPOS price data (mostly on sales by small retailers) which therefore related to ticket prices rather than transaction prices, might lead to some distortion of the price distributions (by excluding in-store, negotiated discounts offered by small retailers). In practice, some three-quarters of the data were transaction prices. But in response to these concerns, we carried out a sensitivity analysis based wholly on EPOS data. In practice, this meant excluding from the analysis all the data under the 'other retailers' heading in Table 11.6 (including the EPOS data from department stores and the smaller multiples-about 10 per cent of the total) and also the residuals: together, these data accounted for 34 per cent of the total. The results¹ of this sensitivity analysis were not substantially different from those in Table 11.5.

¹Modal value bands were largely unchanged from those in Table 11.5. Similarly, the covars were not significantly different from those which include the 'other retailers' data. Four of the covars increased slightly (by an average of 1.1), but the other eight decreased by a similar amount (an average of 1.9), and the overall effect was negligible. The proportion of sales within 5 per cent of the RRP for each model also changed, but again, mostly by only a small amount. Of the ten models with effective RRP's (ie, excluding the two Hoover models), the 'within 5 per cent' measure for seven decreased by an average of 8.6 percentage points, whilst the other two increased by an average of 2.5 percentage points. For details, see Appendix 11.5, Table 1 (and Table 2 for the corresponding information on 'other retailers').

Price history analysis

11.62. In order to examine suppliers' pricing policies over the life cycle of tumble driers, we carried out a study of the price histories of three of the 12 models included in the sample used for our main pricing study, namely the White Knight CL311W and CL412W models, and the Hoover D6854/56. In selecting these particular models, we took into account the relative importance of individual models in terms of overall sales, and the nature of the price distribution data and other information available at the time.

11.63. As part of this exercise, we requested information on standard trade prices. It became apparent, however, that for most suppliers of tumble driers standard trade prices are not meaningful because the majority of their sales are through the larger retailers, with whom the suppliers negotiate individual buying terms, often in the form of discounts from the RRP-see paragraphs 10.91 to 10.131. Details of the pricing information provided by suppliers on these three models are shown in Tables 11.7 and 11.8. As indicated, we obtained information on the level of, and changes in, both nominal and effective RRPs (see paragraph 11.12) over the life of each model.

TABLE 11.7 **Price history: White Knight CL311W model**

Introduced: 1987

Product life: Beyond 31 March 1996

Sales ranking:* Best-selling tumble drier

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i>
Initial price	1987	94.99	94.99
1st change	1990	114.99	114.99
2nd change	1991	114.99	114.99
3rd change	1992	119.99	119.99
4th change	1993	129.99	129.99
5th change	1.2.95	129.99	109.99
6th change	1.5.95	129.99	129.99

Source: Crosslee.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

TABLE 11.8 **Price history: Hoover D6854/56 model**

Introduced: February 1993

Product life: 25 Months (discontinued in March 1995)

Sales ranking:* 22nd-best-selling tumble drier

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i>
Initial price	1.2.93	249.99	249.99
1st change	6.12.93	249.99	229.99
2nd change	5.2.94	249.99	249.99
3rd change	13.6.94	249.99	229.99
4th change	14.8.94	249.99	249.99
5th change	13.12.94	249.99	229.99

Source: Hoover.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraph 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

11.64. The information on the White Knight CL311W model, which during the sample period was by far the best-selling tumble drier, is shown in Table 11.7. For this model, the nominal and effective RRP were the same during the life of the product (eight/nine years), except for February to the end of April 1995 (which included the five weeks of our sample period: at that time, this model was 'on promotion' by Crosslee, and the effective RRP was £20 below the nominal RRP). Over the period 1987 to 1995 the RRP increased by 37 per cent in nominal terms, whilst retailers' gross percentage margins were, we were told, held broadly constant. Crosslee stated, however, that the RRP were themselves notional, in so far as it usually negotiated and agreed trade prices, as well as advising on likely retail selling prices, directly with each of its major customers.

11.65. For this model, one-nearly half of the sales included in our price distribution analysis were accounted for by Dixons, and a further quarter by the RECs (see Table 11.6). For both Dixons and the RECs, the trade price was about £[*] (excluding VAT), which enabled these retailers to sell the CL311W model at a retail price of £99.99 during the sample period with a gross margin of about [*] per cent before other discounts and allowances. At the time of the pricing study, the modal value was at the £95 price band (implying a retail selling price of £99.99), with only 24 per cent of observations within 5 per cent of the RRP. The covar was 8.4, and around 74 per cent of sales were within 5 per cent of the modal price band.

11.66. The White Knight CL412W was the second-best-selling model of tumble drier during the sample period. The nominal and effective RRP were the same during the life of the product, and retailers' gross margins, we were told, were held broadly constant (in percentage terms).

11.67. As with the CL311W, around one-half of the sales included in our price distribution analysis were handled by Dixons, and a further third by the RECs (see Table 11.6). For Dixons, the trade price was £[*] (excluding VAT), which enabled it to sell this model at £129.99 during the sample period with a gross margin of around [*] per cent before other discounts. At the time of the pricing study, the modal value was at the £125 price band (implying a retail selling price of £129.99), with only 2 per cent of observations within 5 per cent of the RRP. The covar was 8.4, and around 89 per cent of sales were within 5 per cent of the modal price band. At this time, the third White Knight model included in our pricing analysis, the CL432W (a higher specification model than the CL412W), was on special promotion by Crosslee at an RRP of £159.99, the same RRP as for the CL412W. Because of the difference in specification, Dixons and the RECs reduced the retail price of the CL412W model to £129.99.

11.68. The price history information on the Hoover D6854/56 model, which was the 22nd-best-selling model during the sample period, is shown in Table 11.8. This model was obsolescent at the time of the pricing study (Hoover ceased active marketing of the model in December 1994, and deliveries to retailers ceased in March 1995). During the life of the product, the nominal RRP was held constant, but the effective RRP was reduced to £20 below the nominal RRP (and subsequently raised again) on three occasions, each coinciding with retailers' traditional sales periods. The RRP in December 1994 was the same as in December 1993.

11.69. At the time of the pricing study the modal value was at the £245 price band (the level of the RRP in December 1994). However, RRP were not specified during the sample period and Hoover told us that trade prices were determined on an *ad hoc* basis in order to clear stocks. The price distribution is bi-modal (at the £195 and £245 bands), reflecting end-of-line discounting (the D6854/56 was replaced by the DF022 model, with an RRP of £229.99). Only 28 per cent of sales were within 5 per cent of the modal price band, which explains why the covar is above the average in our sample, at 14.8.

*Figures omitted. See note on page iv.

Pricing analysis of dishwashers

Price distribution data

11.70. The pricing data used in our study on dishwashers (and the other reference white goods) are explained in detail in paragraphs 11.4 to 11.33. The price distributions obtained for the 12 dishwashers included in our sample, all of which were big-selling (and free-standing) models of the major brands, are shown in the form of bar charts in Figures 25 to 36 in Appendix 11.1. The price data obtained and the statistical parameters are summarized in Table 11.9, and a breakdown of the proportion of sales of each model through different retailers (or groups of retailers)¹ is provided in Table 11.10.

TABLE 11.9 Analysis of pricing data: dishwashers

<i>Brand/model</i>	<i>Units sold*</i>	<i>RRP £</i>	<i>Price observations within ± 5% of RRP (%)#</i>	<i>Modal value band~</i>	<i>CovarÐ</i>
<i>Zanussi</i>					
DW925	1,673	409.99ð	52.1	RRP	24.2
DW915	1,604	389.99ð	65.1	RRP	13.1
DW905	592	339.99ð	59.8	RRP	8.9
<i>Hotpoint</i>					
DF21	1,285	299.99ð	76.7	RRP	5.3
DC21	461	349.99ð	79.4	RRP	5.1
DF41	262	499.99	62.2	RRP	20.5
<i>Bosch</i>					
SMS4452ß	908	359.99ð 349.99ð	80.2	RRP (£345)	5.8
SPS5432ß	762	379.99ð 369.99ð	60.9	£345	6.8
SMS6032ß	743	459.99ð 449.99ð	74.7	£450	4.3
<i>Indesit</i>					
D4000	2,158	N/A	N/A	£215	5.9
D4200	801	N/A	N/A	£245	13.4
D3200**	95	N/A	N/A	£270	12.7
Total	11,344				

Source: GfK, suppliers and MMC.

*Volume of sales used in the pricing analysis; includes sales by all retailers, but excludes mail order and Rumbelows during the period 19 February to 25 March 1995 (see paragraph 11.15).

#See paragraph 11.31.

~ Value bands are in £5 units designated by the lower bound: the £295 band, for example, includes all price observations between £295.00 and £299.99 (see paragraph 11.15). The modal band indicates where most prices were observed to be (see paragraph 11.30).

ÐThe covar is a measure of the spread of prices, and is calculated as the standard deviation divided by the mean value, expressed as a percentage (see paragraph 11.33).

ðThe RRP represents the supplier's promotional price (see paragraph 11.13).

ßThis model had two RRP's during the sample period, as indicated. The percentage of sales shown as being within 5 per cent of the RRP is the aggregate of sales within 5 per cent of each of the RRP's (excluding overlaps) expressed as a percentage of the total number of sales (see paragraph 11.32).

**End-of-line product, ie the model was at or close to the end of its product life (see paragraph 11.25 (c)).

¹The figures in Table 11.10 exclude sales through mail order and Rumbelows. Comparable data which include these retailers are given in Table 3 in Appendix 11.3.

TABLE 11.10 Dishwashers included in the MMC pricing analysis: shares of sales* by retailers

Brand/model						per cent
	Dixons	Comet	RECs	Other retailers#	Residual~	Total ^δ
<i>Zanussi</i>						
DW925	36.5	13.0	12.9	25.5	12.1	100.0
DW915	28.0	8.6	29.2	23.6	10.7	100.0
DW905	1.4	1.5	29.4	66.0	1.7	100.0
<i>Hotpoint</i>						
DF21	22.6	11.6	13.7	41.9	10.2	100.0
DC21	31.2	5.4	24.5	31.2	7.6	100.0
DF41	48.5	1.9	10.3	27.9	11.5	100.0
<i>Bosch</i>						
SMS4452	10.6	15.9	20.7	43.9	8.9	100.0
SPS5432	4.7	6.4	26.6	59.1	3.1	100.0
SMS6032	13.7	11.8	16.2	51.4	6.9	100.0
<i>Indesit</i>						
D4000	0.0	40.3	26.3	18.3	15.1	100.0
D4200	0.0	0.0	95.9	4.1	0.0	100.0
D3200	0.0	0.0	65.3	34.7	0.0	100.0
Weighted average ^δ	16.4	14.9	27.2	32.1	9.4	100.0

Source: GfK and MMC.

*Volume of sales used in the pricing analysis, covering the period 19 February to 25 March 1995; excludes sales through mail order and Rumbelows (see paragraph 11.15).

#Includes some smaller multiple retailers, department stores and small retailers (see paragraph 11.8).

~ Includes sales which could not be allocated to particular retailers or groups of retailers, together with GfK weighting factors.

^δRows of percentage shares may not sum exactly to 100 due to rounding.

^δWeighted by the sales volume of each model.

11.71. As shown in Table 11.9, the total volume of sales (and price observations) included in the analysis was just over 11,000. We estimate that these represent around 25 per cent of the total sales of dishwashers in the UK during the February/March 1995 sample period (for the full year 1995, total sales were about 420,000, at a retail value of £145 million-see Table 7.1).

11.72. The retail price of most popular (big-selling) models is in the range £250 to £500, though some higher specified models can cost significantly more. In our sample, the range of RRP's was £300 to £500. As explained in the footnote to paragraph 11.15, RRP's and shop prices are almost always at so-called 'price points' of, for example, £349.99 rather than £350.

11.73. MDA told us that it does not issue or otherwise establish effective RRP's for its Indesit models-see paragraph 10.17-though it promulgates a form of nominal RRP. All of the nine other (non-Indesit) models had both nominal and effective RRP's. Of these nine, the effective RRP's of eight models were suppliers' promotional prices during the period. Although the sample period did not overlap with retailers' traditional sales periods (the nearest being January 1995), the effective RRP's for three of these nine models (that is, the three Bosch models) changed during the period: each of them is therefore shown in the table as having two RRP's. Eleven of the 12 models were fully current products: the Indesit D3200 model was at the end of its product life.

11.74. For the six models on offer from the two largest suppliers (Emaco and GDA), the modal value band in each case was at the RRP, and the proportions of observations within 5 per cent of the RRP were in the range 52 to 79 per cent. However, for both the Zanussi DW925 (see Figure 25 in Appendix 11.1) and DW915 models, and also the Hotpoint DF41 model, more than 25 per cent of total sales were accounted for by Dixons, which was offering 50 per cent staff discounts at the time of the pricing study. About 10 per cent of sales of the DW925 and the DF41 were affected, though only 3 per cent of sales of the DW915. These staff discounts appear to explain why the covars are relatively high for these models, at 24.2, 20.5 and 13.1, respectively.

11.75. For two of the Bosch models (the SMS4452 and SMS6032), the modal values were at or very close to the RRP, the proportions of observations within 5 per cent of the RRP were 80 per cent and 75 per cent respectively, and the covars were 5.8 and 4.3 respectively. For the SPS5432 model (which is the subject of a price history analysis-see paragraphs 11.83 to 11.85), the covar was 6.8, and the proportion of observations within 5 per cent of the RRP was 61 per cent. Although the modal value was at the £345 band, almost as many sales were at the £365 RRP band: see Figure 32 in Appendix 11.1.

11.76. For the Indesit D4000 model (the largest-selling model included in our sample, and one on which we undertook a price history analysis-see paragraphs 11.81 and 11.82), 40 per cent of total sales were handled by Comet, which was selling it at a price of £219.99. Some 87 per cent of observations were within 5 per cent of the modal price band of £215 (implying a retail selling price of £219.99), and the covar was 5.9 (see Figure 34 in Appendix 11.1). In the case of the D3200 model, nearly two-thirds of total sales were accounted for by the RECs, and 47 per cent of observations fell within 5 per cent of the modal price band; the covar was 12.7 (see Figure 36 in Appendix 11.1). For the D4200 model, which was a 'semi-exclusive' and replacement version of the D3200 model, virtually all sales went through the RECs, and 67 per cent of observations fell within 5 per cent of the modal price band, though the covar was 13.4 (see Figure 35 in Appendix 11.1).

11.77. Table 11.10 sets out the sales distributions of the 12 models in our pricing analysis among four retailers/groups of retailers. Six of the models (two of the Zanussi models, two of the Hotpoint models, and two of the Bosch models) were sold to a significant degree through both of the major retailers (Dixons and Comet) as well as through the remaining retailers. The sales pattern of another five was more concentrated. Sales of the Zanussi DW905, for example, were mainly through 'other retailers' (two-thirds of the total). The Hotpoint DF41 model was sold mainly through Dixons (47 per cent of sales), the RECs and other retailers; sales through Comet were minimal. The Indesit D4000 was sold mainly through Comet (40 per cent of sales), the RECs and other retailers, whilst sales through Dixons were nil. The two major retailers (Dixons and Comet) were not, therefore, in head-to-head competition with respect to these two models. We were told by some retailers and suppliers that such occurrences are not uncommon because retailers often seek to stock models which are different from those of their closest competitors. In some cases, the larger retailers may opt to stock either a slightly different and 'semi-exclusive' model from the same supplier or brand, or to stock a comparable model from a different supplier. The Indesit D4200 model, for example, as explained above, was 'semi-exclusive' to the RECs and was not available through either Dixons or Comet. Information provided by GfK on dishwasher sales for October 1996 indicated that there were over 200 different models of dishwasher available in the UK, of which about 40 were exclusive models, accounting for about 12 per cent of sales volumes, and six were retailers' own-label products. We consider model and range differentiation further in paragraphs 8.61 and 8.62, and 9.87 to 9.90.

11.78. It was put to us by some suppliers that the inclusion of non-EPOS price data (mainly on sales by small retailers) which related to ticket prices rather than transaction prices, might lead to some distortion of the price distributions (by excluding in-store, negotiated discounts offered by small retailers). In fact, about 70 per cent of the data were transaction prices. But in response to these concerns, we undertook a sensitivity analysis based wholly on EPOS data. In practice, this meant excluding from the analysis all the data from 'other retailers' (including the EPOS data from department stores and the smaller multiples-about 10 per cent of the total) and also the residuals: together, these data accounted for 42 per cent of the total. The results¹ of this sensitivity analysis were not markedly different from those in Table 11.9.

¹Modal value bands were largely unchanged from those in Table 11.9. Similarly, the covars were not significantly different from those which include the 'other retailers' data. Eight of the covars increased slightly (by an average of 1.5), but the other four decreased by an average of 0.5. The proportion of sales within 5 per cent of the RRP for each model also changed, but again, mostly by only a small amount. Of the nine models with effective RRP's (that is, excluding Indesit models), the 'within 5 per cent' measure for five decreased by an average of four percentage points, whilst the other four increased by an average of 6.4 percentage points. For details, see Appendix 11.6, Table 1 (and Table 2 for the corresponding information on 'other retailers').

Price history analysis

11.79. In order to examine suppliers' pricing policies over the life cycle of dishwashers, we carried out a study of the price histories of three of the 12 models included in the sample used for our main pricing study, namely the Indesit D4000, the Bosch SPS5432 and the Hotpoint DF41. In selecting these particular models, we took into account the need to examine products from different suppliers, the relative importance of individual models in terms of overall sales, and the nature of the price distribution data and other information available at the time.

11.80. As part of this exercise, we requested information on standard trade prices. It became apparent, however, that for most suppliers of dishwashers standard trade prices are not meaningful because the majority of their sales are through the larger retailers, with whom the suppliers negotiate individual buying terms, often in the form of discounts from the RRP-see paragraphs 10.91 to 10.131. Details of the pricing information provided by suppliers on two of these models are shown in Tables 11.11 and 11.12. As indicated, we obtained information on the levels of and changes in both nominal and effective RRPs (see paragraphs 11.12 and 11.42) over the life of each model.

TABLE 11.11 **Price history: Bosch SPS5432 model**

Introduced: October 1993
 Product life: 27 months (discontinued in January 1996)
 Sales ranking:* 12th-best-selling dishwasher
 Number of changes in RRPs during product life: 12

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i> £	<i>Difference</i>
Initial price	1.10.93	469.99	349.99	120
1st change	1.12.93	449.99	369.99	80
2nd change	1.1.94	449.99	349.99	100
3rd change	1.3.94	469.99	359.99	110
4th change	1.5.94	449.99	379.99	70
5th change	1.6.94	449.99	359.99	90
6th change	1.12.94	449.99	389.99	60
7th change	1.1.95	449.99	369.99	80
8th change	1.3.95	449.99	379.99	70
9th change	1.5.95	449.99	379.99 ^Δ	70
10th change	1.6.95	449.99	379.99	70
11th change	1.12.95	449.99	399.99 ^Δ	50
12th change	1.1.96	449.99	369.99	80

Source: BSDA.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

ΔAlthough the RRP was £399.99, a 'trade-in' allowance of £20 effectively reduced the price to £379.99.

ΔAs a promotional offer, a 'free' kettle (with a retail price of about £20) was given with each unit purchased.

TABLE 11.12 **Price history: Hotpoint DF41**

Introduced: September 1994
 Product life: Beyond 31 March 1996
 Sales ranking:* 28th-best-selling dishwasher

	<i>Date</i> £	<i>Nominal</i> <i>RRP#</i> £	<i>RRP~</i> £	<i>Difference</i>
Initial price	12.9.94	599.99	499.99	100
1st change	26.12.94	599.99	449.99	150
2nd change	30.1.95	599.99	499.99	100
3rd change	25.12.95	599.99	449.99	150

Source: GDA.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

11.81. With respect to the Indesit D4000 model (the top-selling model during the sample period), MDA told us that it did not issue or otherwise establish effective RRPs for its Indesit models-see paragraph 10.17-though it did so for its Ariston and Scholtès models. For Indesit models, it issues what it calls an `SRP' for each model, but in MDA's view, this is neither a nominal nor an effective RRP, in the sense in which we have defined these terms. The SRP for this model at product launch, in April 1994, was £339.99. It was subsequently reduced to £319.99 in January 1995, and then further reduced to £279.99 in October 1995.

11.82. MDA also told us that it negotiated net trade prices and gross margins separately with each of its 50 major customers, rather than applying a standard trade price. It provided details of the trade prices charged to CIH for this model, and also of those charged to Comet, which were [*] per cent lower. The trade price to CIH changed (both upwards and downwards) on six occasions during the period covered. Comet accounted for 40 per cent sales of this model during the sample period, whilst sales through Dixons were nil (see Table 11.10). Comet and Dixons were not, therefore, engaged in head-to-head competition with respect to this model. Comet's net purchase price was £[*] (excluding VAT, but before any retrospective rebates or advertising/promotion allowances), and it was selling this model at a price of £219.99 (including VAT). At the time of the pricing study, the modal price was at the £215 band (which implies a retail selling price of £219.99), with around 87 per cent of sales being within 5 per cent of that price; the covar was 5.9.

11.83. In the case of the Bosch SPS5432 model (see Table 11.11), which was the 12th-best-selling model during the sample period, the RRP was between £50 and £120 below the nominal RRP throughout the life of the product (the cash value of the difference is mentioned explicitly on Bosch's price list: see Appendix 10.1). The nominal RRP was held broadly constant at £449.99, but the effective RRP had been consistently reduced (usually by £20) during the traditional retailer sale periods of January and July, so that the lowest RRPs, and therefore the highest discounts from the nominal RRP, occurred at these times. We note that the RRP in December 1995 was £30 higher than in December 1993.

11.84. BSDA has stated that Bosch does not use a standard trade price, but negotiates buying prices separately with each retailer in relation to discounts from the RRP (which BSDA calls the `SRP'). We understand, however, that retailers' gross margins have been held broadly constant over the life of this model. At the time of the pricing study, the modal value for the SPS5432 was £20 below the RRP, though some 61 per cent of observations were within 5 per cent of the RRP, and the covar was 6.8.

11.85. Towards the end of its product life, 300 units of the Bosch SPS5432 were sold to JLP at a price reduced by £22.40 per unit.

11.86. For the Hotpoint DF41 (see Table 11.12), which was the 28th-best-selling dishwasher during the sample period, the nominal RRP was held constant at £599.99 throughout the life of the product (as were retailers' gross margins, we were told). The effective RRP, on the other hand, was increased or reduced on three occasions, and was consistently either £100 or £150 below the nominal RRP. The lowest RRPs, and therefore the highest discounts from the nominal RRP, occurred during retailers' traditional sales periods. We note that the RRP in December 1995 was the same as that applying in December 1994. The DF41 was replaced in May 1996 by the DF42 model with an RRP of £449.99 (the same as the last price for the DF41).

11.87. At the time of the pricing study, the modal value band for the Hotpoint DF41 was at the RRP, with 62 per cent of observations within 5 per cent of the RRP. The covar was relatively high at 20.5. This appears to reflect sales within Dixons to its staff at a 50 per cent discount: around 10 per cent of sales were recorded at a price of around £250.

* Figures omitted. See note on page iv.

Pricing analysis of CFS equipment

Price distribution data

11.88. The pricing data used in our study on CFS equipment are explained in detail in paragraphs 11.4 to 11.33. The price distributions obtained for the 12 CFS products included in our sample, all of which were big-selling models of the major brands, are shown in the form of bar charts in Figures 37 to 48 in Appendix 11.1. All the models included were free-standing versions: four were combined fridge-freezers (the Candy and the Electrolux models); the other eight were refrigerators, four of which were with a freezer box and four without. The price data obtained and the statistical parameters are summarized in Table 11.13, and a breakdown of the proportion of sales of each model through different retailers (or groups of retailers)¹ is provided in Table 11.14.

TABLE 11.13 Analysis of pricing data: CFS equipment

<i>Brand/model</i>	<i>Units sold*</i>	<i>RRP £</i>	<i>Price observations within ± 5% of RRP (%)#</i>	<i>Modal value band~</i>	<i>CovarĐ</i>
<i>Hotpoint</i>					
RL60	3,381	229.99	85.3	RRP	5.3
RS60	1,946	199.99đ	74.3	RRP	7.8
RL00P	828	189.99đ	76.8	RRP	7.5
<i>Electrolux</i>					
ER2940/4/6	1,347	359.99đ	70.1	RRP	7.5
<i>Zanussi</i>					
ZFC56L	1,364	239.99đ	75.1	RRP	5.6
ZFC50/2	1,254	179.99đ	82.5	RRP	6.3
<i>Lec</i>					
R404B	6,024	134.99đ	29.4	£115	10.6
R504/R550**##	1,360	139.99đ 149.99đ	85.2	RRP (£135)	7.7
L407	1,202	159.99đ	72.6	RRP	10.1
<i>Candy</i>					
CCM 28/12**	2,768	319.99đ 299.99đ	87.9	£290	4.8
CCM 20/10**	1,134	279.99đ 269.99đ	33.3	£260	7.5
CCM 22/10**	473	299.99đ 279.99đ	42.7	RRP (£275)	9.6
Total	23,081				

Source: GfK, suppliers and MMC.

*Volume of sales used in the pricing analysis; includes sales by all retailers, but excludes mail order and Rumbelows during the period 19 February to 25 March 1995 (see paragraph 11.15).

#See paragraph 11.31.

~ Value bands are in £5 units designated by the lower bound: the £295 band, for example, includes all price observations between £295.00 and £299.99 (see paragraph 11.15). The modal band indicates where most prices were observed to be (see paragraph 11.30).

ĐThe covar is a measure of the spread of prices, and is calculated as the standard deviation divided by the mean value, expressed as a percentage (see paragraph 11.33).

đThe RRP represents the supplier's promotional price (see paragraph 11.13).

ßSubject to model change. The R404 was replaced in March 1995 by a restyled version of the same machine, the R450. The £115 modal value band suggests a retail price of £119.99: 74 per cent of observations were within 5 per cent of the modal band (see paragraphs 11.100 and 11.101).

**This model had two RRP's during the sample period, as indicated. The percentage of sales shown as being within 5 per cent of the RRP is the aggregate of sales within 5 per cent of each of the RRP's (excluding overlaps) expressed as a percentage of the total number of sales (see paragraph 11.32).

##The R504 was replaced by the R550 (restyled version).

¹The figures in Table 11.14 exclude sales through mail order and Rumbelows. Comparable data which include these retailers are given in Table 4 in Appendix 11.3.

TABLE 11.14 CFS products included in the MMC pricing study: shares of sales* by retailers

Brand/model						per cent
	Dixons	Comet	RECs	Other retailers#	Residual~	Total δ
<i>Hotpoint</i>						
RL60	18.3	12.4	37.7	31.7	0.0	100.0
RS60	30.3	9.3	28.8	31.6	0.0	100.0
RL00P	21.4	7.5	14.5	39.3	17.4	100.0
<i>Electrolux</i>						
ER2940/4/6	2.6	0.1	57.8	38.9	0.7	100.0
<i>Zanussi</i>						
ZFC56L	26.9	10.6	35.7	26.8	0.0	100.0
ZFC50/2	14.0	12.1	30.0	25.0	19.0	100.0
<i>Lec</i>						
R404	0.0	0.1	64.6	35.3	0.0	100.0
R504/R550	14.7	0.4	16.6	57.3	11.0	100.0
L407	40.6	0.1	4.7	27.7	26.9	100.0
<i>Candy</i>						
CCM 28/12	64.1	0.0	11.6	4.9	19.4	100.0
CCM 20/10	47.4	0.0	18.5	20.1	13.9	100.0
CCM 22/10	0.4	0.2	98.1	1.3	0.0	100.0
Weighted average δ	21.0	4.1	37.2	28.9	8.7	100.0

Source: GfK and MMC.

*Volume of sales used in the pricing analysis, covering the period 19 February to 25 March 1995; excludes sales through mail order and Rumbelows (see paragraph 11.15).

#Includes some smaller multiple retailers, department stores and small retailers (see paragraph 11.8).

~ Includes sales which could not be allocated to particular retailers or groups of retailers, together with GfK weighting factors.

δ Rows of percentage shares may not sum exactly to 100 due to rounding.

δ Weighted by the sales volume of each model.

11.89. As shown in Tables 11.13 and 11.14, the total volume of sales (and price observations) included in the analysis was about 23,000. We estimate that these represent around 10 per cent of the total sales of CFS products in the UK during the February/March 1995 sample period (for the full year 1995, total sales were about 2.56 million, at a retail value of £627 million-see Table 7.1).

11.90. As explained in paragraph 7.101, CFS products include refrigerators, freezers and combined fridge-freezers. The retail price of most popular (big-selling) refrigerators and freezers is in the range £125 to £250 (though some higher-specified models can cost significantly more). Fridge-freezers typically cost an extra £100 or so. In our sample, the range of RRP for the models included was £135 to £360. As explained in the footnote to paragraph 11.15, RRP and shop prices are almost always at so-called 'price points' of, for example, £199.99 rather than £200.

11.91. All the 12 models in our study had both nominal and effective RRP; the effective RRP of 11 models were suppliers' promotional prices during the period. Although the sample period did not overlap with retailers' traditional sales periods (the nearest being January 1995), the effective RRP for four of these 12 models changed during the period, so that each of them is shown in the table as having two RRP. All of the 12 models were fully current products (though two of the Lec products were subject to changes in model number at the end of the sample period).

11.92. For the six models sold by the two largest suppliers (GDA and Emaco), the covars were in the range 5.3 to 7.8, and in each case the modal value band was at the RRP. For these models, the proportions of observations within 5 per cent of the RRP were in the range 70 to 85 per cent.

11.93. The third-largest supplier was Lec. For the Lec R404 (which was by far the best-selling model in our sample, and which is the subject of a price history analysis-see paragraphs 11.100 and 11.101), nearly two-thirds of total sales were accounted for by the RECs-see Table 11.14. The proportion of observations within 5 per cent of the RRP was only 29 per cent, and the covar was 10.6. However, around 74 per cent of sales were within 5 per cent of the modal price band of £115, suggesting a retail price of £119.99. For the

other two Lec models (that is, the R504/R550 and the L407), the modal value in each case was at the RRP, and the proportions of observations within 5 per cent of the RRP were 85 and 73 per cent respectively.

11.94. All three of the Candy models had two RRPs during the sample period (though CDA told us that its RRPs were often notional in practice, in so far as CDA usually negotiated and agreed trade prices and likely retail selling prices directly with each of its major customers). The modal value for the price of the CCM 28/12 model was £290 (the notional RRP was £299.99), though there were almost as many sales in the £295 price band. This model was 'semi-exclusive' to Dixons, which accounted for more than 60 per cent of total sales. Some 88 per cent of sales were within 5 per cent of the two RRPs, and the covar was 4.8.

11.95. For the CCM 20/10 model (see Figure 47 in Appendix 11.1 and the price history analysis in paragraphs 11.99 and 11.100), the modal price was £260, lower than the notional RRP of £269.99, and the proportion of sales within 5 per cent of the two RRPs was only 33 per cent. This reflects the fact that the price distribution is bi-modal with a substantial proportion of sales at the £225 price band, suggesting a retail price of £229.99. Over 40 per cent of sales were through Dixons, which was selling at £229.99. For the CCM 22/10, the modal price band was at the RRP, though only 43 per cent of sales were within 5 per cent of the two notional RRPs. The price distribution is bi-modal, with a substantial proportion of sales at the £245 price band, suggesting a retail price of £249.99. More than 80 per cent of sales were through the RECs, who were selling at £249.99.

11.96. As shown in Table 11.14, five of these best-selling models (the three Hotpoint models and the two Zanussi models) were sold through both of the major retailers (Dixons and Comet), as well as through the remaining outlets, with their respective shares of sales being generally comparable to their overall shares of CFS product sales (see Table 7.7). Four of the other seven models, however (ie the Lec R504 and L407 and the Candy CCM 28/12 and CCM 20/10 models), were sold through only one of the two major retailers (Dixons or Comet), which were not, therefore, in head-to-head competition with respect to these models, though all of them were also available through the remaining retailers. The Candy CCM 28/12, for example, which was the third best-selling model in our sample, was sold through Dixons (which accounted for over 60 per cent of total sales), the RECs and other retailers, but not through Comet. In addition, the remaining three models (the Electrolux ER2940, the Lec R404, and the Candy CCM 22/10) were 'semi-exclusive' to the RECs, which accounted for between 54 and 87 per cent of total sales in each case. We were told by some retailers and suppliers that such occurrences are not uncommon because retailers often seek to stock models which are different from those of their closest competitors. In some cases, the larger retailers may opt to stock either a slightly different and 'semi-exclusive' model from the same supplier or brand, or to stock a comparable model from a different supplier. For example, although Dixons did not sell the best-selling model, the Lec R404, it was offering an 'exclusive' variant of this model (supplied by Lec), as explained later-see paragraph 11.97. Information provided by GfK for October 1996 showed that there were nearly 650 different models of CFS products available in the UK (in large part, of course, reflecting the wide range of different sizes), of which about 100 were exclusive models, accounting for about 17 per cent of sales volumes, and 90 were retailers' own-label products. We consider model and range differentiation further in paragraphs 8.61 and 8.62, and 9.87 to 9.90.

11.97. As explained earlier, it was put to us by some suppliers that the inclusion of non-EPOS price data (mostly on sales by small retailers) which related to ticket prices rather than transaction prices, might lead to some distortion of the price distributions (by excluding in-store, negotiated discounts offered by small retailers). In practice, about 70 per cent of the data were transaction prices. But in response to these concerns, we carried out a sensitivity analysis based wholly on EPOS data. In practice, this meant excluding from the analysis all the data in the 'other retailers' category (including the EPOS data from department stores and the smaller multiples-about 10 per cent of the total) and also the residuals: together, these data accounted for 38 per cent of the total. The results¹ of this sensitivity analysis were not markedly different from those in Table 11.13.

¹Modal value bands were largely unchanged from those in Table 11.13. Similarly, the covars were not significantly different from those which include the 'other retailers' data. Seven of the covars increased slightly (by an average of 0.7), but the other three decreased by (an average of 3.3), and the overall effect was negligible. The proportion of sales within 5 per cent of the RRP for each model also changed, but again, mostly by only small amounts. Of the ten models with effective RRPs (that is, excluding Hoover models), the 'within 5 per cent' measure for nine decreased by an average of 6.3 percentage points, whilst the other three increased by an average of 3.8 percentage points. For details, see Appendix 11.7, Table 1 (and Table 2 for the corresponding information on 'other retailers').

Price history analysis

11.98. In order to examine suppliers' pricing policies over the life cycle of CFS products, we carried out a study of the price histories of three of the 12 models included in the sample used for our main pricing study, namely the Lec R404, the Zanussi ZFC56L and the Candy CCM 20/10. In selecting these particular models, we took into account the need to examine products from different suppliers, the relative importance of individual models in terms of overall sales, and the nature of the price distribution data and other information available at the time.

11.99. As part of this exercise, we requested information on standard trade prices. It became apparent, however, that for most suppliers of CFS products standard trade prices are not meaningful because the majority of their sales are through the larger retailers, with whom the suppliers negotiate individual buying terms, often in the form of discounts from the RRP: see paragraphs 10.91 to 10.131. Details of the pricing information provided by suppliers on these three models are shown in Tables 11.15 to 11.17. As indicated, we obtained information on the level of and changes in both nominal and effective RRPs (see paragraphs 11.12 and 11.46) over the life of each model.

TABLE 11.15 **Price history: Lec R404 model**

Introduced: September 1993
Product life: Beyond 31 March 1996
Sales ranking:* Best-selling CFS product

	Date £	Nominal RRP# £	RRP~
Initial price	1.9.93	159.99	159.99
1st change	1.4.94	159.99	139.99
2nd change	1.6.94	159.99	129.99
3rd change	1.9.94	159.99	139.99
4th change	1.12.94	159.99	134.99
5th change	1.3.95	159.99	139.99
6th change	1.6.95	159.99	134.99
7th change	1.8.95	159.99	139.99

Source: Lec.Đ

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

ĐLec told us that the R404 was replaced in March 1995 by a restyled version of the same machine, the R450.

TABLE 11.16 **Price history: Zanussi ZFC56L model**

Introduced: May 1994
Product life: Beyond 31 March 1996
Sales ranking:* 13th-best-selling CFS product

	Date £	Nominal RRP# £	RRP~ £	Difference
Initial price	1.5.94	259.99	239.99	20
1st change	1.7.94	259.99	219.99	40
2nd change	1.9.94	259.99	229.99	30
3rd change	1.2.95	269.99	239.99	30
4th change	1.6.95	269.99	239.99Đ	30
5th change	1.8.95	269.99	239.99	30
6th change	1.1.96	269.99	229.99	40

Source: Emaco.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

ĐDuring June and July 1995, Emaco (Zanussi) funded a £20 'cash-back' promotion under which the RRP was £239.99, but customers could claim back £20 from Zanussi. Where such claims were made, the effective net price would have been £219.99.

TABLE 11.17 Price history: Candy CCM 20/10 model

Introduced: April 1993
 Product life: Beyond 31 March 1996
 Sales ranking:* 14th-best-selling CFS product

	<i>Date</i> £	<i>Nominal RRP#</i> £	<i>RRP~</i>
Initial price	1.4.93	N/K	319.99
1st change	1.1.94	N/K	279.99
2nd change	1.6.94	329.99	269.99
3rd change	1.10.95	310.00	279.99
4th change	1.1.96	N/K	269.99

Source: CDA.

*The ranking is based on GfK sales data (for February/March 1995), which excludes retailers' own-label and fully exclusive products.

#See paragraphs 11.12 and 11.46.

~ The RRP (including VAT) is the price effectively recommended or suggested by the supplier to retailers at any particular time, which may often be a promotional price (see paragraphs 11.12 and 11.46).

Note: N/K = not known.

11.100. The Lec R404 (a refrigerator with freezer box) was by far the best-selling model during the sample period (see Table 11.15). The lowest RRP, and therefore the highest discounts from the nominal RRP, occurred during retailers' traditional sales periods. Lec told us that it did not use a standard trade price and that its RRP, were largely notional in practice, because it negotiated net trade prices and discussed gross margins and expected retail selling prices with each of its major retail customers (who accounted for most of Lec's sales). The RRP was used as an input to such discussions and negotiations. For the R404 model, the RRP was consistently £20 or £30 below the nominal RRP, throughout the life of the product.

11.101. At the time of the pricing study, the modal price band for the Lec R404 was £115 (suggesting a retail price of £119.99), £15 below the RRP of £134.99). Only 29 per cent of observations were within 5 per cent of the RRP, and the covar was 10.6; 74 per cent of sales were within 5 per cent of the modal price band. This model was 'semi-exclusive' to the RECs, who accounted for around 65 per cent of sales, and they were selling this model at a retail price of £119.99 (that is, a price in the modal value band). The net trade price negotiated with the RECs was about £[*] to £[*] (excluding VAT), which implies a gross margin of about [*] per cent. At this time, Dixons was selling a comparable Lec model at the same price of £119.99.

11.102. The price history information for the Zanussi ZFC56L model (a refrigerator without freezer box), which was the 13th-best-selling model during the sample period, is shown in Table 11.16. The nominal RRP was increased by £10 some ten months after product launch, but was thereafter held constant. Throughout the product's life, the RRP was below the nominal RRP by between £20 and £40, with reductions in the effective RRP coinciding with retailers' traditional sales periods. Retailers' gross margins were, we were told, held constant. We note that the RRP in August 1995 was the same as that applying at the product's launch in May 1994. At the time of the pricing study the modal value was at the RRP, 75 per cent of observations were within 5 per cent of the RRP and the covar was 5.6.

11.103. The Candy CCM 20/10 (a combined fridge-freezer) was the 14th-best-selling model during the sample period. The RRP for this model (see Table 11.17 and Figure 47 in Appendix 11.1) was below the nominal RRP (by about £40) over the period for which data were available. We note that the RRP in January 1996 was the same as that applying in June 1994. As explained earlier (see paragraph 11.50), CDA told us that its RRP, were often notional in practice, in so far as area sales managers usually negotiated and agreed trade prices and likely retail selling prices directly with each of their major customers. Retailers' gross margins have been held constant, we were told, at about 35 per cent in total.

11.104. At the time of the pricing study, the modal value was at the £260 band (suggesting a retail selling price of £264.99, which was £5 below one RRP, and £15 below the other RRP). Only 33 per cent of

*Figures omitted. See note on page iv.

observations were within 5 per cent of the RRP, and 36 per cent within 5 per cent of the modal price band. The covar was 7.5 and the distribution is bi-modal, with a substantial proportion of sales at the £225 price band (suggesting a retail selling price of £229.99). Some 47 per cent of sales were accounted for by Dixons, and a further 18 per cent by the RECs. The net trade price negotiated with Dixons was reduced in March 1995 to £[*] (excluding VAT: the RECs' trade price was comparable), which allowed it to sell at the agreed retail price of £229.99 with a gross margin of [*] per cent before other discounts.

Comments by suppliers and retailers on the pricing studies

11.105. Some suppliers and retailers noted that our pricing studies indicated a degree of clustering of retail transaction prices at the RRP. However, several concerns were expressed by suppliers about both the data and the methodology used; most of these were addressed earlier in paragraphs 11.4 to 11.33. On the former, the main concerns were as follows:

- (a) that the period covered was too short to be representative, and ignored pricing dynamics (see paragraph 11.9);
- (b) exclusive concentration on best-selling models had biased the results toward price convergence at the RRP (see paragraphs 11.10 and 11.11);
- (c) the weekly averaging of the EPOS data would have reduced the observed dispersion of prices (see paragraphs 11.6, 11.26 and 11.27);
- (d) that the use of displayed prices for small retailers meant that in-store discounts granted by such retailers were not recorded, so that the data failed to show the full range of transaction prices (see paragraphs 11.17 and 11.18); and
- (e) that the data did not record non-price offers (such as interest-free credit) and therefore understated the degree of retailer competition (see paragraphs 11.4 and 11.5).

11.106. Arguments were also put forward about the appropriate conclusions to be drawn. It was claimed by some that the data failed to establish an association between transaction prices and RRPs. The argument was also advanced that, to the extent that there was an association, it did not arise from the influence of RRPs, but instead reflected the effects of a high degree of price visibility in these markets and the intensity of competition. GDA stated that it believed that there was no evidence of a relationship between price clustering and RRPs.

11.107. In a paper submitted on behalf of GDA, Lexecon stated that there were flaws in the argument that the setting of RRPs reduced competition in pricing. On the basis of an analysis of the price data for all four reference white goods taken together, Lexecon made a number of points (some of which had also been advanced by others) as follows:

- (a) There was no definitive link between the extent of price variability or price clustering and the competitiveness of a market. Lexecon said that in their video games report the MMC had found that Nintendo and Sega were behaving anti-competitively despite covars in prices in the UK being above those in more competitive markets. Lexecon noted that if a comparison was made of levels of variability for UK prices of eight compact discs and cassettes as found in the MMC recorded music inquiry, on a statistical z-test comparison, these were not significantly different from the levels found for 45 white goods (excluding outliers).
- (b) A high degree of price clustering was to be expected in a competitive market for high-value goods since search costs as a proportion of purchase costs were low. In effect, consumers had more to gain by shopping around and comparing prices for, say, a £300 washing machine, than for, say, a compact disc costing £15. Purchasers of white goods had every incentive to incur the costs associated with gaining information on prices. This made it difficult for retailers to maintain price disparities.

*Figures omitted. See note on page iv.

Consumers were concerned about price levels, Lexecon argued, not price variability. For a given product and a given level of service, consumers wanted to pay the lowest possible price.

- (c) The MMC pricing analyses failed to consider the additional value to consumers of non-price benefits such as interest-free credit, free delivery of appliances and free gifts.
- (d) It was as a result of market competition that modal prices were often at RRP. According to Lexecon, manufacturers aimed to position the RRP at or very close to the apparent modal price. In addition, the RRP was often revised and reduced to the modal price, in the light of market conditions, suggesting that RRP were reactive rather than determinative.
- (e) Absence of price variability was an indication that consumers are not being exploited.
- (f) The MMC had not provided evidence that there was a particular range for the covars of transaction prices which was appropriate to competitive markets. At the same time, the MMC had not explained the mechanisms, Lexecon claimed, through which RRP were meant to exert their influence on transaction prices.
- (g) The price patterns that emerged from the data could be explained as symptomatic of a competitive market.
- (h) Lexecon suggested that since RRP did not appear to be set for Indesit models of washing machines and dishwashers (see paragraph 11.37, but also paragraph 10.17), these could be taken as a control test for the influence of RRP on other products. The average covar for the three Indesit washing machines was 6.97, which was not significantly different, on a statistical z-test comparison, from the average for other products (of 5.62). Similarly, the average covar for the three Indesit dishwashers was 10.67, which was not significantly different from the average of other dishwasher products of 11.54. Lexecon accepted that this statistical analysis was limited by the fact that the sample size was small, with one of the samples analysed containing only three observations. (We note that even with five in the smaller of the two groups compared one would not expect the derived sample standard deviation for that group to produce a reliable figure for the purpose of a z-test comparison; it is usual to require a sample of at least 15 for the smaller of the two groups to be compared, such that the pooled group of observations comprises at least 30 observations.)

11.108. Lexecon used two types of econometric model (which employed a limited number of secondary statistics derived from the basic GfK data on price observations) to test the extent to which covars were associated with a high proportion of price observations at or close to the RRP. In the regression analysis which Lexecon carried out, the covar was the dependent variable. The independent variables used in the models were the logarithm of units sold; the logarithm of average prices; the four-firm supplier concentration ratio for each product category; the percentage of sales within 5 per cent of RRP, dummy variables for two of the major manufacturers, Hotpoint and Zanussi; and a dummy variable for cases where significant numbers of staff discounts were known to be affecting price observations. Lexecon said that its modelling also showed that there was no indication of a significant relationship between supplier concentration (whether measured by the four-firm concentration ratio for each product, or the Herfindahl-Hirschman index of concentration) and price variability.

11.109. On the basis of their two models, one a standard ordinary least squares (OLS) model and the other a weighted least squares (WLS) model, with data points weighted by volumes of sales for each product, Lexecon found that the 'within 5 per cent' coefficient was not statistically different from zero, since the t-value was less than the 1.96 threshold for significance at the 95 per cent level.¹ Lexecon argued that if RRP were believed to influence price variability, a higher proportion of sales at or close to RRP would reduce price variability, and claimed that its models found no evidence of this relationship.

¹For the OLS model the t-value for the 'within 5 per cent' coefficient was 1.673, and for the WLS 1.217.