Review of Income and Wealth
Series 41, Number 4, December 1995

ELEMENTARY AGGREGATES, MICRO-INDICES AND SCANNER DATA: SOME ISSUES IN THE COMPILATION OF CONSUMER PRICE INDICES

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The paper argues for the use of scanner data from EPOS systems for use in the compilation of consumer price indices. A number of methods of calculating micro-indices from such data are outlined. Scanner data for colour television sets in the U.K. are used as an example. The Törnqvist chained index is used as a benchmark against which alternative formulations, including those based on representative products, can be judged, the errors often being substantial. The paper argues for the use of scanner data, illustrates methods of compiling micro-indices and points to the potential for serious errors from conventional methods.

I. INTRODUCTION

This paper is concerned with the computing of elementary aggregates for Consumer Price Indices (CPIs). Its purpose is to address two neglected points in the literature. First, it will argue for the use of EPOS (Scanner) data in the compilation of CPIs. Second, it will outline and illustrate via such data how rigidities in the weighting systems can lead to serious errors. The latter has only been addressed in the compilation of CPIs at a more aggregated level where weights from a, (by necessity) previous and out-of-date, Household Expenditure Survey are applied at least annually, the weights being held constant for the monthly indices between the annual rebase in December or January. The errors involved in using out-of-date annual weights have been considered in Fry and Pasharides (1986) and Silver and Ioannidis (1994). Studies relating to the use of fixed weights in the months (or in some countries, years) between rebasing are problematic due to the very lack of weights for these periods, the author being unaware of any such studies. The use of scanner data provides an opportunity to remedy this.

II. ELEMENTARY AGGREGATES, MICRO-INDICES AND THE COMPILATION OF CONSUMER PRICE INDICES (CPIs)

CPIs are compiled as a weighted average of price changes of *elementary aggregates*. These aggregates are the highest level of disaggregation at which price

Note: This paper is part of a wider study undertaken for the U.K. CSO whose support is acknowledged. We are also grateful to GFK Marketing Services for the provision of data. The paper naturally does not draw on confidential CSO data and the views of the author should not be taken to be those of the U.K. CSO. Helpful comments were received from Roger Clarke and Christos Ioannidis (University of Wales, Cardiff), Ralph Turvey (London School of Economics), and an anonymous referee. The usual disclaimers apply.

observations are combined and for which information on quantities or values are available for weights. Such aggregates are usually representative items, such as a 21″ (inch) television set, whose price changes are assumed to represent price changes of a wider set of items (e.g. all large screen television sets). This saves on the cost of obtaining price data for all items. These aggregates may be defined (and thus price changes weighted) separately for each region a set is sold in, or also by type of outlet. These basic indices of elementary aggregates to which weights are attached are referred to as *micro-indices* (Szulc, 1989). Data on weights for micro-indices are generally taken from Household Expenditure Surveys (HES). These monitor consumption expenditure, generally from diaries of a random sample of households, over a year and in practice there is a lag between their being conducted and their use to allow time for compilation (see, for example, CSO, 1980). Price collection is from a sample of stores usually for a few days in the middle of the month to which the index relates. The degree of randomness in the selection of stores and items varies between countries, the U.S. having a random selection (BLS, 1988) and the U.K. a purposive one (Department of Employment, 1987). The Laspeyres base period weighted index is widely used with some countries (e.g. the U.K. and France) updating their weights from annual HESs and combining these links through successive multiplication to form a chained index (OECD, 1980); that is the Laspeyres index is given, for period $0=1.00$, by:

$$I_{0,t}=\sum w_0 P_{0,t}. \tag{1}$$

Where w is the weight assigned to each micro-index; $P_{0,t}$ the micro-index for price changes between periods 0 and t and summation is over elementary aggregates. The chained Laspeyres is given by:

$$I_{t,t+n}=I_{t,t+1}\times I_{t+1,t+2}\times I_{t+2,t+3}\ldots I_{t+n-1,t+n}. \tag{2}$$

While the study of index number formulae has an extensive history (see, for example, Fisher, 1922, Allen, 1975 and Diewert (1978 and 1981), the compilation of micro-indices has only recently received attention with, for example, studies by Forsyth (1978), Carruthers *et al.* (1980), Morgan (1981), Szulc (1983, 1989), Turvey *et al.* (1989), Ohlsson (1990) and Dalen (1992). Szulc (1989) outlines the different methods of aggregating elementary aggregates and the assumptions implicit in them. As arithmetic means these take two forms:

(i) *The ratio of arithmetic means*

$$\frac{\sum P_t/n}{\sum P_0/n}=\frac{\sum\{(P_t/P_0)P_0\}/n}{\sum P_0/n}=A \tag{3}$$

that is, a price weighted index of price changes, and

(ii) *The arithmetic mean of price relatives*

$$\frac{\sum P_t/P_0}{n}=\left[\frac{\sum P_t\cdot\dfrac{1}{P_0}}{\sum P_0\cdot\dfrac{1}{P_0}}\right]=R. \tag{4}$$

The difference between the R and A method is that in R all the price changes are equally weighted, whereas in A they are price weighted—items which cost more have a larger weight. The upward bias of the R formula was first emphasized by Fisher (1922, pages 66 and 383–84). Dalen (1992) shows how the R formula can lead to absurd results (a price decrease of $20/25=0.8$ combined with an increase of $25/20=1.25$ leading to $(0.8+1.25)/2=1.025$ when, overall, prices are unchanged. The use of the R method was abandoned in the Swedish CPI in May 1990 following discovery of large differences between it and the more acceptable (in theory) geometric mean (see Dalen, 1992, page 144).

There are of course alternative approaches to forming micro-indices including the harmonic mean in both A and R form, and the geometric mean (A form $=R$ form) and Szulc (1989) has outlined the characteristics of these measures and Dalen (1992) has shown how they perform with regard to axiomatic "tests" and compare with each other. In practice equations (3) and (4) are generally used, though a resolution of the Fourteenth International Conference of Labour Statisticians (ILO, 1987) recommended, for micro-indices, ". . . *consideration* should be given to the possible use of geometric means" (author's italics). Having considered the means by which CPIs are compiled from their elementary aggregates, we turn to the use of scanner data for these micro-indices.

III. Scanner Data and Micro-Indices

By scanner data we refer to data collected by bar-code reader, or the associated code number typed in, Electronically at Point-Of-Sale (EPOS). Data include, for each transaction, the transaction price, store, branch, date and time of purchase, product, brand, make and model. In many product areas (at least in the U.K.) all retailers using EPOS pass such data to an agency that compiles the data for the market as a whole, which is then sold to manufacturers and returned to retailers for planning purposes. Data on average prices and sales value are available on a highly disaggregated basis including region and type of product. For the analysis in this paper we use such data for colour television sets (CTVs). In 1993 this covered over 2.8 million transactions, compared with the usual hundreds or even thousands covered by visits to stores. Aggregate data were made available to us on monthly average prices by type of CTVs (17 categories by size of screen and with and without fastnet). Not all stores use EPOS, other stores being sampled. The EPOS coverage is estimated at 70 percent of market coverage, increasing to ". . . well over 90 percent of the market by supplementing it with manual auditing," as is the case with data used in this study.

The author is unaware of the use of scanner data for compilation of CPIs. It has a number of advantages. The first three relate to potential sources of error from the price data. If scanner data are used for the elementary aggregate such errors will be minimal:

(a) from the selection of "representative" items, all items being covered;
(b) from the selection of date/time at which the item's price is sampled, all transactions being covered;
(c) from the selection of stores at which the price quotations are observed, all stores being covered or a sample taken of those not;

Errors arising from lack of weights within each elementary aggregate will be avoided and errors arising from poor weights for each of them will be minimised, since the scanner data provide both.

(d) At present the weights for elementary aggregates are generally taken from an HES which may have taken place (for example, *the Family Expenditure Survey* (FES) in the U.K.) between 6 months and $1\frac{1}{2}$ years ago (Kemsley *et al.*, 1980). Even these out-of-date results will have sampling errors attached, the standard error for the expenditure on audio-visual goods and services (excluding videos) being estimated to be about £12 in 1992 (CSO, 1993). Scanner data allows for the continual updating of weights at the very highest level of disaggregation.

Advantages also extend to:

(e) Potential for improved quality adjustment. The alignment of television model numbers with quality characteristics (available from manufacturer's documentation) will provide an excellent database for the calculation of hedonic indices. In addition the potential exists for excluding specified models undergoing major quality changes from the figures, adjusting their price for quality changes with these adjusted prices being incorporated back into the data. Since for this industry, quality changes are generally conducted annually and signalled by model changes adjustments are quite feasible (Iounnidis and Silver, 1995).

Against all of this are disadvantages which include difficulties in defining weights to exclude atypical (rich and poor) groups of consumers. However, for the U.K. this is not undertaken for prices. Only in weighting the elementary aggregates could adjustments be made to the more accurate scanner weighting using ratios of expenditure on items from the FES which excludes and includes the groups. There is also a loss of control by the Statistical Office in the data collection activity. The outcome of a choice between being in control of inaccurate data, or delegating control to an external agency to collect accurate data, will depend. (a) on the extent of errors and (b) on the confidence in the external agency. Scanner data also records transaction prices as opposed to the "shelf" price. In some EPOS systems discounts from, for example, "multi-buys" and coupons, may be deducted from the price of the product, which suits the needs of the CPI. In others, the aggregate discount may be recorded and substracted from the total. The coverage of the EPOS data may also be cause for concern.

IV. Issues in the Compilation of Micro-Indices

Having argued for the use of scanner data in the compilation of micro-indices, we turn to an application to price changes of colour television sets (CTVs) in Britain. In this section we outline methods, in the next, results. The data covered over 2.8 million transactions in 1993 with a sales value of around £830 million. We conducted interviews with manufacturers, retailers and trade organisations into their pricing policies. Of particular importance was the (generally) annual change in models, often with only minor quality changes, though in some cases quite major ones. These changes occurred in April with the models being launched at the trade fair, the months immediately prior to April being used to discount the prices of old models. December was marked by an increase in the sales of CTVs generally for Christmas, with sales of portables for presents being particularly high. Scanner data allows us to disaggregate by store, region, make and model, though such a level of disaggregation was not available to this study. To provide an insight into the potential for disaggregation it is worth noting that about 1,000 models of CTVs are on sale at any one period, models being generally changed annually. The data provided and used in the study are the 28 million transactions disaggregated into 17 types of CTVs classified by screen size and

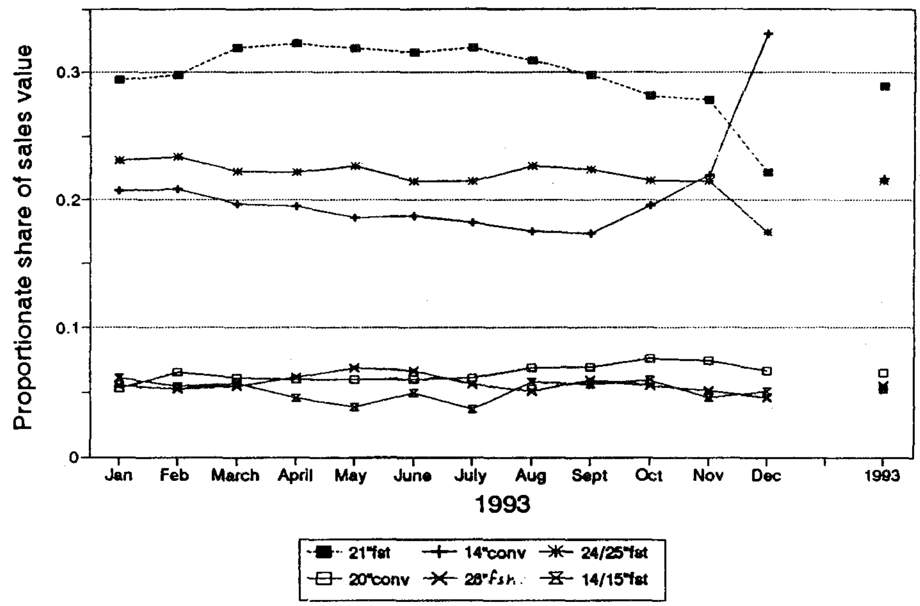

Figure 1. Share of sales value (weights) of CTVs (1993–GFK data)

possession of fst (fastnet) or otherwise (conventional). Figure 1 shows the share by value of the six types of sets each accounting for at least 5 percent (and in total 89 percent) of sales value, and Figure 2 their (unit) price. We consider the computation of micro-indices by several methods.

(a) *Unweighted A-method*

At first sight the micro-indices might be compiled from the scanner data using the A-method (equation (3), which is widely used and not subject to the "absurd" results noted earlier for the R-method (Dalen, 1992). We would simply compare average prices each month with those in the preceding January. The result in Table 1 shows a fall of 13.3 percent in December 1993 compared with January 1993. Yet the percentage price changes over this same period for the six major types of sets (5 percent or more of market share) were: −5.8 percent (14″ conv.); −0.1 percent (14/15″ fst); +0.02 percent (20″ conv.); +0.02 percent (21″ fst); +5.9 percent (24/25″ fst); +17.9 percent (28″ fst). The reason for this inconsistency lies with the inappropriate level of aggregation. In December 1993 sales of 14″ conv. sets accounted for 33 percent of sales value compared with 21

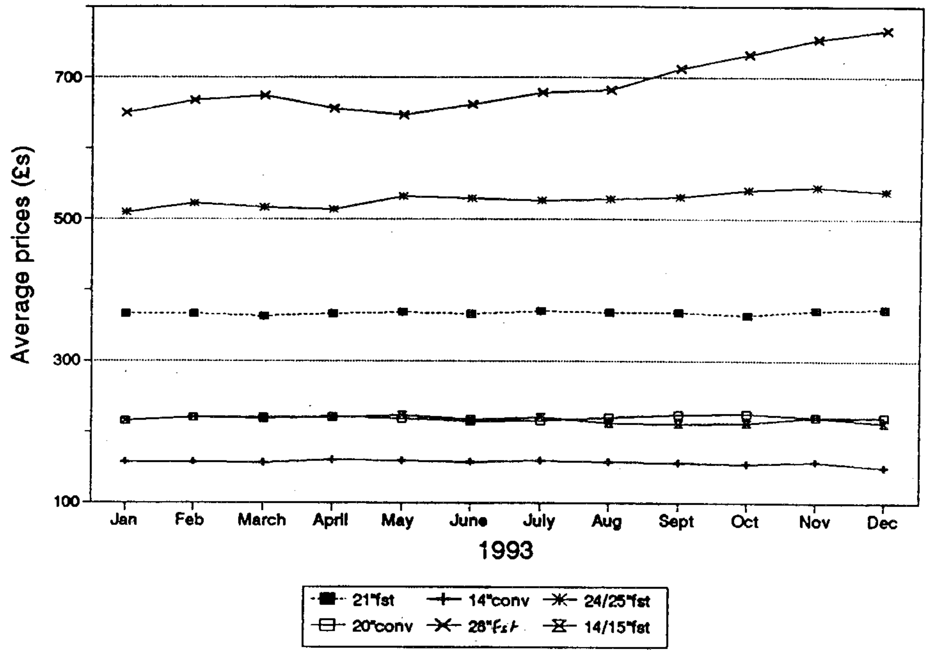

Figure 2. Average prices of portable CTVs (1993–GFK data)

percent in January 1993. The basket of television sets had dramatically changed to include a much higher proportion of cheaper sets thus distorting the micro-index.

(b) *Average 1993 Weights*

The average 1993 weighted index takes the relative value of each of the 17 types of colour televisions for 1993 and weights the respective average price changes by these fixed-weights. The resulting index, unlike all others presented here, could not be compiled in practice since for any month other than December, sales value for 1993 would not be available. Our interest in this method lies in its correspondence to the methodology used in practice. This relies for its weights on an HES which covers a period of a year, but is untimely since it may take around 6 months for the results to be compiled, the weights thus being between 6 months and 18 months out-of-date. The 1993 weights is an updated formulation using average weights over a year as in the current method.

(c) *Laspeyres January 1993 Weights*

The index takes as its weights fixed weights in January 1993. While this corresponds to a formal Laspeyres index for the period January 1993 to December 1993, it suffers from serious potential bias if January weights are atypical.

(d) *Rolling Weights*

A practical and conceptual problem with (b) above is that it uses data outside of the period of the comparison. However (b) had the advantage over (c) above in that the weights were not unduly influenced by seasonal factors peculiar to January. Thus for (b) above if the elementary aggregates were the 17 types of CTVs, the appropriate weights would not be the backdated FES weights, nor the January Laspeyres scanner weights, but the weights for the sales value for all of 1993. While this is possible retrospectively it is not practical for compiling the index in practice. A practical equivalent would be rolling weights; for January to February comparison, all the sales values in January; for January to March, the sales value to February and for January to December, the sales values to November. An alternative formulation would be to use the last 12 months for each and every month. This would have the advantage of the weights not being affected by unusual seasonal patterns, though this is not explored here because of lack of data available to the author. Note: for December the rolling Laspeyres differs from the "average 1993 weights" in that being Laspeyres, the weights cover January to November for the December against January comparison.

(e) *Fixed Base Törnqvist*

A limitation of the Laspeyres is that the weights are constrained to the base period. The popularity of Laspeyres arose not only from its simplicity of form (and thus explanation), but also from the practical exigency of requiring time to collect expenditure data for the weights. Yet the Laspeyres suffers from a substitution bias as consumers substitute away from goods and services with relatively high prices, this not being captured in the fixed base period weights (Braithwait, 1980). Consumers substitute items with relatively high price changes to those with relatively low price changes. However, Laspeyres with its fixed base period basket of items does not include such substitutions leading to an upwards bias. Laspeyres overstates an index derived from economic theory that measures the cost of a constant level of utility (CUL). Törnqvist has been shown to approximate a CUL index and belongs to a class of index numbers referred to by Diewert (1978) as *superlative* since the approximation holds for consumers with quite flexible functional forms to their utility function. The Törnqvist index includes base (b) and current (c) period weights and is given by:

$$\exp\{\textstyle\sum \frac{1}{2}(w_b + w_c)\ln(P_c/P_b)\}. \tag{5}$$

The base and current periods are the respective months of the comparison. Since the data available to the author were aggregate prices for the 17 types of TVs, the summation was over these 17 types, though in principle could be extended much further.

(f) *The Chained Laspeyres Index*

We can improve further on the Laspeyres formulations by chaining the index as in equation (2). This is justified via its natural discrete approximation to a Divisia index. The Divisia approach receives its support on the grounds of its greater representativeness and its derivation from an accounting identity (Forsyth and Fowler, 1981 and Silver, 1984). A chained Laspeyres index would, for the January to March comparison, use January weights for the January to February change, February weights for the February to March change, and combine these two changes by successive multiplication. This results in an index which takes into account the dynamic changes in weights, rather than a comparative static fixed base one as in (e) above.

(g) *The Chained Törnqvist Index*

This uses chaining as in equation (2) and (f) above, but the links are derived via the Törnqvist formula given in equation (5).

(h) *The Method of Weighted Indicators*

In practice data are not available on all types of CTVs because of cost and time constraints. Representative CTVs would be chosen which are likely to have substantial expenditure shares and are (together) likely to mirror the price changes of other types of CTVs. For the U.K. Retail Prices Index 14″ and 21″ CTVs are used as representative items for small and large CTVs respectively. The first set of weights are those derived from FES data for use in 1993 in the RPI, the elementary aggregates for CTVs being small and large screen sets. The remaining formulations adopted in Table 1 mirror methods (a) to (g) above, but for weighted indicators.

V. Results

Table 1 shows the results compiled using a variety of methods first, based on using all types of CTVs and second, weighted indicators of 14″ and 21″ CTVs.

Considering the "all items" results first, the sharp fall in the unweighted *A*-method index to 86.73 in December is a severe downwards bias arising from the basket of CTVs containing a much higher proportion of cheaper portables in December than in other months. It points to the need for Statistical Offices to aim for equal sample sizes for different types of products where the seasonal mix of such products can be expected to change. It must be borne in mind that "type" here refers to size of screen. As noted above, scanner data allows us to extend "type" down to region, make and model number. A seasonal bias to cheaper models or makes for a given screen size would also lead to bias.

Table 2 helps to identify similarities and differences between the remaining methods via summary measures. We start with comparisons between each index series and the chained Törnqvist as a best approximation to a CUL index. As expected the *A*-method shows the most serious divergence, fixed-based Törnqvist shows a divergence of on average (MAD) nearly 0.1 percentage point, and at most (0.42-December) with the fixed based Törnqvist consistently below the chained version, the difference increasing over time. The use of average 1993 annual weights (which would in practice not be available) provides quite similar results to the chained Törnqvist. While this has no theoretical basis in this context, as noted before the use of expenditure survey weights in practice relates to a whole

TABLE 1

ALTERNATIVE FORMULATIONS OF MICRO-INDICES

All Items	January	February	March	April	May	June
Unweighted A-method	100.000	100.573	101.064	103.560	106.041	103.893
Average 1993 weights	100.000	101.087	100.518	101.510	102.308	101.627
Laspeyres Jan 1993 weights	100.000	101.638	100.916	101.725	102.567	101.948
Rolling Laspeyres	100.000	101.638	100.763	101.528	102.335	101.687
Fixed base Törnqvist	100.000	101.352	100.616	101.459	102.322	101.743
Chained Laspeyres	100.000	101.638	100.897	101.759	102.612	102.012
Chained Törnqvist	100.000	101.352	100.631	101.475	102.327	101.735
	July	August	September	October	November	December
Unweighted A-method	104.442	105.032	106.196	102.839	102.193	86.733
Average 1993 weights	102.151	101.576	101.923	101.892	103.254	101.961
Laspeyres Jan 1993 weights	102.486	101.847	102.280	102.237	103.745	102.437
Rolling Laspeyres	102.254	101.683	102.107	102.092	103.452	102.231
Fixed base Törnqvist	102.260	101.613	101.969	101.906	103.229	101.286
Chained Laspeyres	102.592	102.064	102.414	102.445	103.783	102.484
Chained Törnqvist	102.295	101.734	102.074	102.062	103.377	101.707

Weighted Indicators	January	February	March	April	May	June
Laspeyres FES weights	100.000	99.942	99.139	101.013	100.848	100.282
Average 1993 weights	100.000	100.037	99 174	100.791	100.823	100.273
Laspeyres Jan 1993 weights	100.000	100.037	99.174	100.791	100.823	100.273
Rolling Laspeyres	100.000	100.037	99.175	100.779	100.821	100.272
Fixed base Törnqvist	100.000	100.037	99.175	100.766	100.819	100.272
Chained Laspeyres	100.000	100.037	99.171	100.763	100.839	100.294
Chained Törnqvist	100.000	100.039	99.171	100.748	100.833	100.287
	July	August	September	October	November	December
Laspeyres FES weights	101.050	100.534	100.187	99.124	100.655	98.705
Average 1993 weights	101.096	100.598	100.346	99.296	100.911	99.754
Laspeyres Jan 1993 weights	101.096	100.598	100.346	99.296	100.910	99.752
Rolling Laspeyres	101.103	100.609	100.376	99.330	100.960	99.946
Fixed base Törnqvist	101.103	100.607	110.369	99.308	100.919	99.251
Chained Laspeyres	101.129	100.636	100.410	99.363	100.990	99.884
Chained Törnqvist	101.125	100.632	100.407	99.359	100.983	99.468

year, albeit an out-of-date one. This more timely version shows encouraging results in terms of the relatively small differences between it and the chained Törnqvist. The rolling formulation, for which data in practice would be available also has relatively small divergences from the chained Törnqvist. It is the use of the Laspeyres formulation (fixed base or chained) where the divergences are greatest. Laspeyres, as noted earlier, suffers from a substitution bias and the results of Table 1 show fixed base Laspeyres January 1993 weights to consistently overstate their Törnqvist counterparts, and the chained base Laspeyres to consistently overstate its Törnqvist counterpart. Table 2 shows the magnitude of the differences to be about 0.35 percentage points on average (MAD) for the chained Laspeyres comparison with, at worst, 0.78 (December). In December the difference between fixed based Laspeyres and fixed base Törnqvist was 1.15 percentage points, and all of these discrepancies are when average inflation is around 2 percent. The consistent direction and extent of the substitution bias and the fact that Törnqvist includes current and base period weights, along with its theoretical justification as a superlative index, argues for its use. Scanner data allows us to practically use the formula.

Table 2(b) involves the method of weighted indicators where 21″ CTVs are used to proxy large screen CTVs and 14″ CTVs small screen ones. The weights

TABLE 2(a)

COMPARISONS BETWEEN CHAINED TÖRNQVIST AND OTHER FORMULAE

	MAD	RMSE	MAX	MIN
Unweighted A-method	3.243	5.066	14.975	0.433
Average 1993 weights	0.140	0.158	0.265	0.019
Laspeyres Jan 1993 weights	0.278	0.319	0.730	0.113
Rolling Laspeyres	0.116	0.188	0.523	0.008
Fixed base Törnqvist	0.094	0.151	0.422	0.000
Chained Laspeyres	0.357	0.383	0.777	0.266

TABLE 2(b)

COMPARISON BETWEEN AVERAGE 1993 AND FES-WEIGHTED INDICATORS

	MAD	RMSE	MAX	MIN
Average 1993 FES	0.194	0.342	1.049	0.009

TABLE 2(c)

COMPARISON BETWEEN ALL ITEMS AND WEIGHTED INDICATORS

	MAD	RMSE	MAX	MIN
Average 1993 weights	1.519	1.627	1.627	0.719
Laspeyres Jan 1993 weights	1.885	1.987	2.941	0.934
Fixed base Törnqvist	1.557	1.647	2.598	0.693
Chained Laspeyres	1.926	2.020	3.082	0.995
Chained Törnqvist	1.611	1.709	2.704	0.727

TABLE 2(d)

COMPARISON BETWEEN CHAINED TÖRNQVIST AND OTHER FORMULAE FOR WEIGHTED INDICATORS

	MAD	RMSE	MAX	MIN
Laspeyres FES weights	0.194	0.284	0.763	0.005
Average 1993 weights	0.056	0.095	0.286	0.002
Laspeyres Jan 1993 weights	0.056	0.094	0.284	0.002
Rolling Laspeyres	0.061	0.146	0.478	0.002
Fixed base Törnqvist	0.043	0.072	0.217	0.000
Chained Laspeyres	0.043	0.126	0.417	0.001

are the actual untimely weights for 1993 from the U.K. *Family Expenditure Survey*. The comparison is counterfactual; it argues that the annual untimely survey weights may be better represented by the actual weights for 1993 (which in practice would not be available). If we updated the weights in this counterfactual manner, the discrepancy is very large with a maximum of 1.05 percentage points and average (MAD) of 0.19. The comparison is also not strictly valid because the FES weights are adjusted to exclude high income and low income families, which are included in the "total sales value in 1993" weighting using scanner data. Nonetheless, the differences remain marked.

Table 2(c) compares each "all items" with their corresponding "weighted indicator" indices. Here the results show consistently high differences both on average and at the extremes. For example, the average (MAD) difference between a chained Törnqvist all items index, and a chained Törnqvist weighted indicator index is 1.61 percentage points, with a maximum of 2.704 percentage points. Figure 2 and, for portables, Figure 3 shows price changes for these indicators to

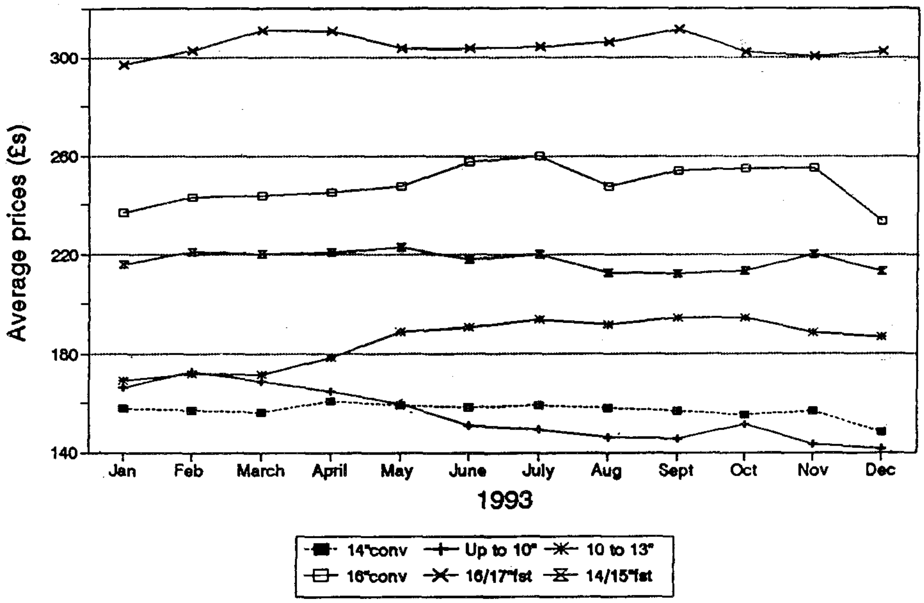

Figure 3. Average prices of CTVs 1993–GFK data

be not representative, though they comprise together 51 percent of market share (Figure 1).

Finally, Table 2(d) reveals how each weighted indicator formula compares with a chained Törnqvist weighted indicator, a similar comparison to Table 2(a), but for weighted indicators. The argument is that if indicators have to be used, how do other versions match up? The FES version is the worst, though for reasons noted above the comparison is not strictly valid. Otherwise differences are on average relatively small, though December maintains its extreme position. All of this is not to attach validity to the method of weighted indicators. In Table 2(c) we show the Törnqvist weighted indicator to differ substantially from its all items counterpart. In addition these "small" errors are for relatively low inflation rates, and are at the lowest level of aggregation and only represent aggregation errors by screen size; region, shop type, make, model having yet to feature.

Conclusion

The theory and practice of CPIs has a long and extensive literature. Yet there remains a paucity of work at the level of micro-indices, which are the building blocks of a CPI. Much of the existing work has focused on alternative methods of averaging price data including the relatives of averages and average of relatives, such averages generally being arithmetic, though geometric and harmonic have been considered along with their implicit weights see Turvey *et al.* (1989) and for their robustness to tests Dalen (1992).

This paper has considered the merits of scanner data as a new source for CPIs, and using such data has shown how quite conventional formulations can be applied for micro-indices. This has served to both illustrate at this elementary level the usefulness of such a source, the index number formulae issues that will arise at this level, and the potential error that may arise using other methods, such as weighted indicators. The author had available to him data by screen size, though the potential exists to disaggregate to quite extreme levels, including by store chain, region, make and model. The results here cannot of course be generalized to other product groups. Yet the availability of this source has allowed us to illustrate how such data might be used and the potential sources of error in compiling micro-indices given sampling errors and biases have been minimized.

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