A Pragmatic Approach to the Selection of Appropriate Index Formulae

Keith Woolford, Australian Bureau of Statistics

Introduction

The Australian Bureau of Statistics has commenced work on redeveloping the computer system used for processing price indexes. This has acted as a catalyst for a review of current procedures in an endeavour to identify avenues for:

i. reducing the complexity of the processing system, and
ii. minimising the ongoing cost of maintaining viable indexes.

This paper outlines briefly some of the issues relevant to the calculation of micro-indexes that have been considered to date.

Outline of current Australian practices

In Australia, the CPI is compiled each quarter for each of the eight capital cities and the "national" index is calculated as the weighted average of the eight capital city indexes. A Household Expenditure Survey (HES) is conducted approximately every five years and the results used to update expenditure weights (on an annual outlays basis) for 8 commodity groups, 35 sub-groups and 107 expenditure classes (regimen items) for each city. These weights are fixed between HES based reviews and, when updated, the new series are chain linked to the previous series.

Regimen item (expenditure class) indexes are aggregated to successively higher levels (sub-group, group, and all groups) using the expenditure weighted variant of the Laspeyres formula.

Indexes for expenditure classes may be derived directly from one or more samples of price observations (elementary aggregates) but are more often derived from the aggregation of a hierarchy of component indexes which are in turn derived from one or more elementary aggregate indexes. The weights for components below the expenditure class level are not normally derivable from HES data nor are they fixed between HES based reviews.

With some notable exceptions, elementary aggregate indexes are calculated as weighted arithmetic means of price relatives[1] (where the term 'price relative' is used to denote the ratio between the price prevailing in the current period and the price prevailing in some fixed reference base period — as distinct from a period to period price ratio).

---

[1] $I_i = \sum_N W_{B,N} \times {}^{P_{i,N}}\!/\!_{P_{0,N}} \times 100$ where $W_{B,N}$ represents outlet N's reference base period expenditure weight. Note that the expression ${}^{P_{i,N}}\!/\!_{P_{0,N}} \times 100$ equates to an index number for the individual item from outlet N in period i.

Use of fixed weights

Although in concept the Australian CPI is a fixed quantity index, it is often neither practicable nor desirable to rigidly adhere to this principle for the computation of all sub-indexes. The extent to which this approach can be implemented in practice is constrained both by the limitations of source data used for calculating weights[2] and by the logistics of updating all weights at a single point in time. Further, even if possible, fixing weights at all levels of an index for an extended period of time has the undesirable effect of inhibiting an index's capacity to respond to changes in the market place at the micro level — increasing the risk of an index becoming unrepresentative.

Determination of the precise level at which weights should be fixed is a matter of judgement. However, the general objective is to fix weights at a level which represents clear distinctions between individual goods and services that are not readily substitutable and to retain flexibility to change weights at the lower levels to reflect changes in relative expenditures on those goods that are readily substitutable. It is also highly desirable to be able to obtain all fixed weights from a single source (eg HES). In the case of the Australian CPI weights are only fixed down to the expenditure class level.

Once the approach of only fixing weights down to the expenditure class level is accepted, the objective in calculating expenditure class index numbers can be expressed in terms of deriving, within available resource constraints, the best possible estimate of price evolution for the expenditure class as a whole. While the constraint of maintaining fixed weights for an extended period of time for components below the expenditure class level is lifted, the principle of measuring pure price change from period to period should be preserved by ensuring that whenever these weights are changed, the new series are chain linked to the old.

Index structures below expenditure class level

Within a city, the universe of transactions for any expenditure class can be defined by a two dimensional matrix of items and outlets. The selection of item and outlet samples and the determination of pricing and aggregation methodologies are the primary objectives of the ABS' sample review program[3].

In the absence of point of purchase survey data, the ABS uses judgemental sampling to select both outlets and items (with the objective of selecting samples which are representative of price evolution for a much wider range of goods and services than those actually priced — in general this results in the selection of those items and outlet types which are most significant in terms of population group expenditures).

---

[2] In the case of a CPI full implementation would require complete knowledge of the expenditures on each individual good and service purchased by households together with information about the outlets from which they were purchased.

[3] The sample review program aims to cycle through each of the 107 expenditure classes between major HES based reviews (ie every 5 years). However, the program has to retain a degree of flexibility to be able to respond, in a reactive way, to those changes in the marketplace which have the potential to significantly influence price behaviour in the short term.

The procedure is as follows:

i. select a clearly defined, closely related area of the index (eg the fresh fruit and vegetables sub-group);

ii. analyse the transactions space in both the item and outlet dimensions (taking into account any regional variations);

iii. identify the conceptual commodity coverage and the relative importance of sub-regimen classes of items (eg within fresh fruit ascertain the relative importance of citrus, pomme, stone etc) and develop a hierarchical classification down to the point where unique representative specifications can be identified for pricing (the outcome of the analysis of the item dimension for fresh fruit and vegetables is presented at Appendix 1);

iv. identify those items which are generally stocked as a single group and sold by all outlet types engaged in their trade to construct a "collection" (in the fresh fruit and vegetables example, all items are generally available from all outlet types as it is not usual for outlets to specialise in the sale of either fresh fruit or fresh vegetables);

vi. determine the relative importance of the different outlet types to the total sales of all commodities covered by the collection; and

vii. determine the pricing basis, frequency, method of index construction and the numbers of observations required and then the numbers of outlets from which prices are to be obtained by outlet type.

The level of commodity coverage embodied by the collection concept currently being developed in Australia (as described above) is similar in concept to the CPOPS categories used by the United States Bureau of Labor Statistics and generally reflects the lowest level of commodity aggregation for which reliable outlet type sales data is available (eg while it is reasonably straightforward to obtain sensible estimates of sales of fresh fruit and vegetables in aggregate by outlet type, it is not possible to obtain similar data in respect of each variety or even for fresh vegetables separately from fresh fruit).

The use of sub-regimen level commodity classifications within the formal index structure combined with the use of centrally determined (judgemental) samples of specifications results in elementary aggregates that are relatively homogenous.[4] This strategy significantly reduces the cost of price collection (as within outlet sampling is minimised) and the workload involved in making adjustments for changes in quality (as the number of unique specifications is minimised), greatly facilitates the analysis of results (as contributions to index outcomes can be readily sourced to particular items) and enables the ready production of micro-level indexes for particular applications (such as price deflation of components of the National Accounts).

---

[4] Although the ideal would be perfectly homogenous elementary aggregates with tightly defined "national" specifications, this is not always possible. However, even in those instances where there is a need to resort to "store standard" specifications, the items to be priced are still defined as tightly as possible.

The selection of outlets is undertaken at the collection level rather than as an independent exercise for each elementary aggregate. While the sample size for each collection is also a matter of judgement, the factors to be taken into account are:

i. the diversity of outlet types involved;

ii. the expected "strike rate" (ie the proportion of individual outlets likely to be able to furnish a price for an individual specification); and

iii. price volatility (influencing the number of observations required in an index compiling period and the spread of observations through the period).

However, the final objective is to select numbers of each outlet type in proportion to the outlet types share of total sales of the items covered by the collection (ie to achieve self weighting outlet samples).

The use of self weighting outlet samples at the collection level facilitates the maintenance of both outlet and item samples and negates the need for explicit outlet weights within elementary aggregates. It is current practice to tailor collection schedules (either paper or electronic) to individual outlets to allow for pricing of "store standard" specifications and to remove from an individual schedule items that are not stocked. If an outlet ceases business or ceases to be representative, the price collector can revert to the "master" collection schedule for the purpose of enrolling a replacement (rather than make use of the schedule tailored to the previous respondent which, over time, will result in ever diminishing samples).

Calculation of elementary aggregate indexes

The current processing system was designed to make exclusive use of the weighted arithmetic mean of price relatives approach. It requires the calculation of explicit weights for each respondent specification within an elementary aggregate. A particular strength of this approach is that, once price relatives have been computed, a single aggregation algorithm can be used to derive indexes at all levels

However, the universal use of the arithmetic mean of price relatives approach is not achievable in practice and it is necessary to calculate some indexes externally to the main system in an environment which is significantly harder to manage. This approach is also demonstrably deficient in cases of genuine zero prices (either base or current) which are not uncommon in a number of service areas (eg hospital and medical services, parking services, urban transport services etc) and other cases where explicit (and sometimes variable) quantity weights are required to maintain constant quality (eg motor vehicle insurance). Even in instances where the approach is sound, it can impose significant overheads in index maintenance costs due to the requirement to calculate explicit weights.

Although the algebraically equivalent "relative of arithmetic mean prices" approach provides solutions to the specific instances where the arithmetic mean of price relatives approach fails, it was recognised that a globally more effective index processing system might be developed if the index compilers could select an elementary aggregate calculation formula from a suite of such formulae. The specific formulae being considered are:

I geometric mean of price relatives;

II arithmetic mean of price relatives; and

III relative of arithmetic mean prices.

Further, in light of the approach being adopted for the selection of outlet samples, the focus was placed on the use of the unweighted (or equal weighted) variants of the above formula.

Efforts to assess the relative strengths and weaknesses of these alternative approaches and reach a conclusion clearly favouring one approach over the others[5] have not been entirely successful. Cogent arguments have been put both for and against the exclusive use of each option (on a combination of conceptual and practical grounds). The remainder of this paper represents an attempt to reproduce the essential elements of the discussion that has taken place within the ABS over recent months.

The logical starting point is the known properties of the alternative approaches from the perspective of their effect on index outcomes.

- the three approaches deliver an identical outcome when all price movements are equal (regardless of the dispersion of price levels);
- approaches II and III deliver identical outcomes when all base period prices are equal (regardless of the dispersion of subsequent price movements);
- approaches I and III deliver identical outcomes (of no change) under conditions of price “bouncing” (ie where the same set of prices are observable in the reference period as in the base period — with the difference being that they are observed at different outlets); and
- approach I delivers the same result as an approach based on the relative of geometric mean prices under all conditions.

Dealing first of all with the arithmetic approaches (II and III). Of the three approaches considered, these are the only ones to preserve fixed underlying quantity weights (approach II, inversely proportional to base period prices, and approach III, equal).

Method III

The approach based on the relative of arithmetic mean prices is inherently attractive due to its immediately demonstrable equivalence to the standard Laspeyres formula, its ability to deal equitably with price bouncing and the fact that it produces an average price as an automatic by-product of index construction[6]. However, arguments against the general adoption of this approach[7] are centred first on the fact that, in practice, outlet weights (implicit or explicit) are at best based on knowledge of relative value shares rather than quantities, and second, that the use of average prices (and price levels) alone deny the index compiler ready access to individual measures of long term price behaviour (price relatives) which have proven invaluable in assessing the long term “health” of elementary aggregates.

---

[5] For general use within the CPI rather than as a solution to specific problems.

[6] The demand for average prices data being poorly satisfied from the current system due to the additional cost involved in their production.

[7] Recollecting that there are a number of specific areas within the CPI for which this approach offers the only practical means of constructing indexes (see paragraph 17).

While the precise nature of weighting information (values or quantities) has little impact on the results for homogenous elementary aggregates comprised of perfect (or very close) substitutes for which it is reasonable to expect little price dispersion, the effect on aggregates comprising store standards (which may exhibit high price dispersion[8]) can be significant as the more highly priced items will be effectively overweighted and movements in their prices will tend to drive the index. The extent to which the reliability of a price index depends upon the judgement exercised by the index compiler cannot be overstated. As a consequence, all other things being equal, an approach which provides more information about the behaviour of price samples should be preferred over one that provides less.

Method II

The strengths of the approach based on the arithmetic mean of price relatives are seen to be the better alignment of outlet weights (values) with the underlying source data, its ability to cope more equitably with store standards (or indeed any elementary aggregate comprising items which, while representative of the class of items covered by the aggregate, are not perfect substitutes) and the additional information embodied in price relatives. The major weakness of this approach is seen as the counter intuitive way in which it deals with price bouncing.

The term price bouncing is used to refer to circumstances where outlets are seen to "swap" prices between any two periods. For example, assume that in period t outlet A sells apples for $2.00/kg and outlet B sells apples for $1.00/kg, and that in period t+1 the prices are reversed. The period t+1 price relative for outlet A is given by 1.00/2.00 = 0.5, while that for outlet B is given by 2.00/1.00= 2.00, giving an average of (0.5 + 2.00)/2 = 1.25 — an aggregate price increase of 25%. This outcome would generally be regarded as perverse. In reality it is only perverse if $2.00 represents the "normal" price for apples; if apples are subject to price volatility through frequent "special" prices and the random nature of the sampling process happened to price outlet B at a time when it had apples on a special price. If the base period prices happen to reflect the normal prices prevailing at these two outlets then, by definition with equal sales values, outlet B would have historically sold twice as many apples as A and therefore, the $1.00 increase at outlet B should have a bigger impact on the average price than the $1.00 fall at outlet B. However, in the case of perfect or very close substitutes (like apples), the former case is the more likely.

Unfortunately the incidence of individual prices varying markedly around the "true" mean is common and hence a high incidence of genuine price bouncing is observable in elementary aggregate indexes. The problem is exacerbated when "special" prices are observed in the base period due to the long term implications for underlying quantity weights[9]. Although this problem is well recognised there doesn't appear to be any widely accepted, systematic means of adjusting base period prices that doesn't involve the revision of indexes.

---

[8] For example, an elementary aggregate for crockery items can include items ranging from individual pieces from a discount store, to expensive imported dinner sets from a specialty store. While the two store types may have an equal share of the total value of crockery sales, the discount store achieves this through significantly higher volumes.

[9] In an ideal world, base period prices should be consistent with the value weights assigned to outlets. However, in practice, outlets are selected and weights assigned well in advance of initial price collection.

Method I

The geometric mean of price relatives approach is intuitively appealing however justification for its use on either theoretical or practical grounds is less straightforward. Its immediately obvious strengths are — it assigns base period outlet weights in accordance with the source data (ie equal values); it handles the problem of price bouncing equitably (see paragraph 20 above); it provides the index compiler with price relatives; and it delivers outcomes identical to those obtained by the relative of geometric mean prices approach[10]. Its major drawbacks are seen to be the difficulty statisticians would encounter explaining its use to the larger community and the fact that it does not preserve fixed underlying quantity weights.

While it might prove difficult to explain the use of geometric means to the general community, the explanation of complex statistical procedures is not something that is unique to price indexes. It is reasonable to assume that the community has an expectation that the statistician will adopt practices that are best suited to the task at hand. Therefore, the perceived difficulty of explaining the technique should not be viewed as a barrier to its adoption.

The fact that this method does not adhere to the fixed quantity concept is of greater concern. Although it has already been noted that weights for sub-regimen components are subject to change, these changes are introduced through linking to ensure that period to period movements are aggregated using fixed weights. The geometric mean approach, on the other hand, effectively uses dynamically variable quantity weights. Rather than maintaining constant quantity weights, the formulae based on geometric means maintains constant "value shares" (ie an outlets relative value share of the total market is preserved from period to period — not just in the base period as with the arithmetic formulae). Also, except in specifically contrived instances, the total quantities associated with an individual aggregate will also change (increasing or decreasing).

Despite its deviation from the theoretically preferred constant quantity concept, other properties of this method (such as its ability to deliver sensible outcomes under conditions of price bouncing) may be such that they outweigh the loss of conceptual purity. In particular, the fact that the geometric mean effectively allows for substitutions by redistributing underlying quantity weights in favour of outlets exhibiting lower rates of price change may, under certain circumstances, compensate for less than optimum frequencies of outlet reviews and deliver more intuitively reasonable outcomes than either of the arithmetic methods under similar conditions[11].

For example, consider the case of an aggregate comprising identical commodities (ie perfect substitutes) with the only differences being the outlets from which they are purchased. While there may be variations in the price levels, in a situation of stable market shares the outlets could normally be expected to exhibit similar price movements. The development of

---

[10] Not discussed separately in this paper because of this identity and the already stated preference for approaches that deliver price relatives over those that don't (other things being equal).

[11] Although this characteristic is generally touted as a desirable attribute for an estimator of a cost of living (COL) index, the Australian CPI does not claim to be a COL index and consideration of this characteristic of the geometric formula is not based on any desire to move it in this direction.

significant dispersion in the price relatives often signals a significant shift in market shares as consumers switch to the relatively cheaper outlets. Existing procedures for reviewing outlet samples, constrained by resource limitations, invariably results in an adjustment of outlet weights well after the shift has taken place — by which time the outlets with declining market share have already exerted a significant upward influence on the index. Under these circumstances, the geometric approach will dampen the influence of those outlets exhibiting relatively higher rates of price growth either prolonging the useful life of the index or enabling the introduction of new outlet samples at a lower index level than would occur using the arithmetic approach.

The extent to which the validity of this technique is accepted or not hinges largely on the view one takes of the contribution the outlet makes to the quality (or utility) of the item. If one takes the view that the outlet plays a significant role in defining the quality of the product, this technique is likely to be rejected in favour of an approach which preserves fixed outlet weights. On the other hand, if one takes the view that the quality of a product can be decomposed into one element related to the outlet (convenience, quality of service etc) and one related to the utility derived from the consumption or ownership of the product itself and that the value of the former is both of minor significance and subject to constant re-evaluation by consumers, this technique is likely to be regarded favourably.

Empirical evidence

While it is known that the alternative approaches have the potential to deliver different outcomes, it is not possible to predict the extent to which the measures will differ in practice (except under contrived circumstances). To provide some indication of the differences and their impact on aggregate index outcomes, existing price data was used to construct indexes for the Fresh fruit and vegetables sub-group for one city using, in turn, each of the three approaches to derive indexes for the twenty three elementary aggregates (with index aggregation using weighted arithmetic means).

The results are presented in Appendices 2 to 6. Appendix 2 illustrates the application of the different approaches to a sample of tomato prices over a twelve month period. Appendix 3 presents monthly indexes for each of the 23 elementary aggregates. Appendices 4, 5 and 6 illustrate the outcomes at the component, expenditure class and sub-group level for each approach in turn.

The following table summarises the outcomes at the elementary aggregate level in terms of the highest, median and lowest estimate of price increase over the twelve months.

Table 1.

	Method		
Ranking	I	II	III
Highest	1*	19	3
Median	6	4	13
Lowest	16	—	7
Total	**23**	**23**	**23**

* This is an aberration due to imputation of the index for the last three months of the year.

The following table summarises the outcomes over the twelve months (in percentage terms) at the expenditure class and sub-group level.

Table 2.

Sub-group and expenditure class	*Method*		
	I	II	III
Fresh fruit and vegetables	16.7	22.2	16.9
Fresh fruit	10.0	16.1	10.6
Potatoes	-12.6	-11.9	-12.3
Fresh vegetables	26.9	32.7	26.6

The results depicted in table 1 are largely according to expectations. The approach based on the geometric mean of price relatives delivered the lowest rate of annual increase in 16 of 23 samples; the approach based on the arithmetic mean of price relatives delivered the highest rate of annual increase in 19 of 23 samples while the approach based on the relative of arithmetic mean prices delivered the median rate of annual increase in 13 of 23 samples.

Table 2 indicates that the choice of formula used for the calculation of elementary aggregates has a significant effect on aggregate results with an annual difference at the sub-group level of 5.5 percentage points being observed. The similarity of the results delivered by methods I and III is not a coincidence as the particular items chosen for this comparison typically exhibit price bouncing.

Conclusion

It is clear that the choice of micro-aggregation formula can have a significant impact on aggregate results. However, after taking account of some of the practical aspects of index construction, the evidence does not point to the clear superiority of a single formula in all circumstances. While it should be possible to develop a set of guidelines to assist statisticians in selecting the formula most appropriate to the circumstances, the final choice should, as is the case in so much of the work associated with price indexes, be left to the judgement of the prices statistician.

APPENDIX 1

Index structure and relative value weights for Fresh Fruit and Vegetables.

Sub-group, expenditure class, component, elementary aggregate	Percentage contribution to next highest level		
Fresh fruit and vegetables			
Fresh fruit	39		
Citrus		20	
Grapefruit			12
Oranges			65
Mandarins			23
Pomme		28	
Apples			73
Pears			27
Stone		7	
Peaches			79
Plums			21
Tropical		29	
Bananas			97
Pineapples			3
Other		16	
Watermelon			25
Strawberries			44
Grapes			31
Potatoes	9		
Potatoes			100
Fresh vegetables	52		
Green		25	
Beans			36
Cabbages			12
Celery			20
Cauliflower			32
Root and bulb		16	
Carrots			78
Onions			22
Salad		45	
Lettuce			58
Tomatoes			42
Other		14	
Pumpkin			50
Mushrooms			50

APPENDIX 2: Elementary aggregate index for tomatoes.

Prices ($)

	1993							1994					
Respondent	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
A	1.69	1.14	2.24	3.24	2.19	2.99	3.49	2.99	2.49	3.49	1.99	2.49	2.69
B	1.95	1.95	2.95	3.42	3.42	2.72	4.00	3.50	3.50	3.50	2.90	2.90	2.50
C	1.54	1.04	1.99	2.64	2.19	2.49	3.84	2.99	2.99	3.99	1.99	1.99	2.29
D	1.49	1.59	1.48	2.14	3.24	1.74	3.99	1.69	2.99	4.99	1.49	1.99	3.49
E	1.49	1.39	2.09	2.74	2.84	2.49	3.49	2.49	2.99	3.99	1.99	2.49	3.99
F	1.34	1.14	2.24	1.74	2.74	1.74	3.24	0.99	0.99	2.99	2.99	1.49	1.99
G	2.49	1.99	2.74	2.99	2.74	2.99	4.49	3.99	2.99	3.99	2.99	2.49	2.99
Ave Prices:													
Arithmetic	1.71	1.46	2.25	2.70	2.77	2.45	3.79	2.66	2.71	3.85	2.33	2.26	2.85
Geometric	1.68	1.42	2.20	2.64	2.73	2.40	3.77	2.44	2.54	3.81	2.26	2.22	2.78
Relatives of mean prices:													
Arithmetic		85.4	131.2	157.7	161.5	143.1	221.4	155.5	158.0	224.7	136.3	132.1	166.3
Geometric		84.5	131.1	157.2	162.7	142.9	224.7	145.5	151.5	226.7	134.8	132.1	165.5

Price relatives

	1993							1994					
Respondent	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
A	100.0	67.5	132.5	191.7	129.6	176.9	206.5	176.9	147.3	206.5	117.8	147.3	159.2
B	100.0	100.0	151.3	175.4	175.4	139.5	205.1	179.5	179.5	179.5	148.7	148.7	128.2
C	100.0	67.5	129.2	171.4	142.2	161.7	249.4	194.2	194.2	259.1	129.2	129.2	148.7
D	100.0	106.7	99.3	143.6	217.4	116.8	267.8	113.4	200.7	334.9	100.0	133.6	234.2
E	100.0	93.3	140.3	183.9	190.6	167.1	234.2	167.1	200.7	267.8	133.6	167.1	267.8
F	100.0	85.1	167.2	129.9	204.5	129.9	241.8	73.9	73.9	223.1	223.1	111.2	148.5
G	100.0	79.9	110.0	120.1	110.0	120.1	180.3	160.2	120.1	160.2	120.1	100.0	120.1
Averages:													
Arithmetic	100.0	85.7	132.8	159.4	167.1	144.6	226.4	152.2	159.5	233.0	138.9	133.9	172.4
Geometric	100.0	84.5	131.1	157.2	162.7	142.9	224.7	145.5	151.5	226.7	134.8	132.1	165.5

APPENDIX 3: Alternative estimates of elementary aggregate indexes.

Item/method	1993							1994					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Grapefruit													
Geometric mean	100.0	76.3	82.4	54.7	69.0	66.2	70.8	64.7	72.0	69.0	86.5	81.4	95.1
Mean of relatives	100.0	83.0	88.8	60.1	74.5	70.0	75.9	65.9	73.6	70.2	89.6	87.0	96.4
Relative of means	100.0	82.3	86.9	62.6	75.1	71.7	77.0	67.6	74.0	72.1	87.0	87.1	94.7
Oranges													
Geometric mean	100.0	105.8	85.3	113.9	121.9	115.9	113.0	110.8	112.0	113.7	108.3	149.8	124.2
Mean of relatives	100.0	122.8	102.0	129.1	140.6	135.9	127.5	130.9	131.9	133.3	124.4	168.8	144.2
Relative of means	100.0	98.9	82.5	104.7	110.4	104.7	103.4	99.7	101.0	103.0	97.7	152.0	116.2
Mandarins													
Geometric mean	100.0	67.8	71.1	83.7	103.2	101.5	104.3	96.0	99.3	103.8	112.1	106.1	124.6
Mean of relatives	100.0	68.6	74.6	87.8	108.2	106.3	109.3	100.6	104.1	108.8	117.5	107.5	126.0
Relative of means	100.0	69.9	72.2	85.2	106.3	104.5	107.5	98.9	102.3	107.0	115.5	107.3	126.2
Apples													
Geometric mean	100.0	103.6	101.5	107.4	110.8	108.1	106.0	123.8	129.7	125.0	100.9	97.2	116.0
Mean of relatives	100.0	107.3	103.9	109.4	114.3	109.6	109.1	131.9	138.1	132.2	108.9	106.2	122.3
Relative of means	100.0	104.5	102.0	106.9	110.4	107.2	106.1	126.5	134.3	126.4	104.2	102.2	117.8
Pears													
Geometric mean	100.0	109.8	116.2	117.6	137.6	151.7	151.8	148.3	68.5	88.4	116.8	105.7	105.7
Mean of relatives	100.0	112.9	122.3	121.6	141.8	157.0	160.4	157.6	73.8	95.5	126.5	110.0	113.8
Relative of means	100.0	107.9	113.9	118.0	136.1	149.8	148.8	152.4	76.7	87.9	115.6	106.0	106.0
Peaches													
Geometric mean	100.0	97.9	83.8	83.8	91.9	90.2	90.7	105.1	104.5	112.5	114.1	117.4	128.4
Mean of relatives	100.0	101.9	87.8	87.5	96.4	94.4	95.0	111.9	106.1	112.8	113.8	116.9	128.1
Relative of means	100.0	97.3	83.9	83.0	90.7	88.8	89.9	103.9	103.9	111.1	112.5	117.9	127.8
Plums													
Geometric mean	100.0	97.9	83.8	83.8	91.9	90.2	90.7	99.0	116.0	127.4	129.2	133.0	145.5
Mean of relatives	100.0	101.9	87.8	87.5	96.4	94.4	95.0	105.5	119.1	130.8	132.0	135.5	148.6
Relative of means	100.0	97.3	83.9	83.0	90.7	88.8	89.9	100.9	117.1	128.6	130.2	136.4	147.8
Bananas													
Geometric mean	100.0	114.0	74.3	61.2	67.1	67.7	67.6	59.6	68.9	78.9	88.3	80.3	96.8
Mean of relatives	100.0	114.5	75.2	61.8	67.9	68.4	68.2	61.3	70.8	80.6	89.3	81.0	100.6
Relative of means	100.0	113.6	75.9	62.1	68.4	68.4	68.4	61.3	70.9	80.8	88.2	79.9	101.0

APPENDIX 3: cont

Item/method	1993 Jun	Jul	Aug	Sep	Oct	Nov	Dec	1994 Jan	Feb	Mar	Apr	May	Jun
Pineapples													
Geometric mean	100.0	105.8	119.3	126.8	107.4	109.7	131.3	116.3	128.4	127.0	111.1	104.9	90.8
Mean of relatives	100.0	106.7	120.1	127.7	109.9	111.2	132.5	117.2	132.8	130.1	118.9	110.9	97.0
Relative of means	100.0	105.9	119.4	126.3	107.8	109.6	129.8	116.1	132.8	131.6	118.5	114.6	99.1
Watermelon													
Geometric mean	100.0	61.9	63.1	55.2	121.1	114.3	125.6	90.2	68.3	71.4	79.8	101.0	125.1
Mean of relatives	100.0	62.5	63.6	56.5	121.6	114.9	126.0	91.4	68.9	72.2	80.5	103.5	127.5
Relative of means	100.0	62.6	62.6	55.2	120.7	114.5	125.1	92.4	69.9	73.0	81.9	101.3	126.0
Strawberries													
Geometric mean	100.0	61.9	63.1	55.2	46.0	36.6	40.3	60.2	58.1	53.8	63.6	64.3	97.7
Mean of relatives	100.0	62.5	63.6	56.5	46.9	37.2	42.5	61.1	60.1	60.1	65.2	66.8	101.4
Relative of means	100.0	62.6	62.6	55.2	45.8	37.2	42.0	61.0	57.4	57.4	67.0	64.2	96.6
Grapes													
Geometric mean	100.0	61.9	63.1	55.2	46.0	36.6	40.3	115.5	89.7	96.8	105.4	117.0	99.4
Mean of relatives	100.0	62.5	63.6	56.5	46.9	37.2	42.5	116.3	92.4	98.7	108.4	118.1	100.2
Relative of means	100.0	62.6	62.6	55.2	45.8	37.2	42.0	115.4	91.8	96.8	106.9	116.9	100.2
Potatoes													
Geometric mean	100.0	106.4	92.6	88.0	94.1	89.2	93.1	76.8	89.9	77.0	79.3	76.5	87.4
Mean of relatives	100.0	106.9	93.9	89.5	95.5	90.5	93.6	78.2	92.9	78.9	80.0	77.7	88.1
Relative of means	100.0	105.2	94.6	91.3	96.5	92.1	94.6	77.9	92.0	80.0	81.1	79.0	87.7
Beans													
Geometric mean	100.0	113.8	121.9	118.0	100.1	107.5	120.5	130.2	144.1	143.9	135.7	131.4	126.5
Mean of relatives	100.0	117.2	124.5	121.1	100.7	108.2	123.3	135.1	147.5	155.3	141.8	132.6	131.9
Relative of means	100.0	112.3	120.4	116.4	100.8	108.1	118.4	128.4	141.3	144.5	136.2	131.4	125.0
Cabbages													
Geometric mean	100.0	108.2	103.4	114.1	102.5	108.4	96.2	155.0	140.0	140.9	136.1	170.6	176.4
Mean of relatives	100.0	111.0	104.6	115.8	105.1	111.1	100.0	162.4	142.8	145.0	141.4	173.1	188.5
Relative of means	100.0	106.4	102.7	113.3	100.9	109.0	95.4	155.6	144.3	140.3	134.3	169.8	178.1
Celery													
Geometric mean	100.0	99.2	101.2	110.3	110.2	92.8	102.8	99.3	160.4	153.9	152.8	132.3	120.9
Mean of relatives	100.0	101.6	106.1	114.7	114.7	96.7	106.1	103.3	169.2	163.9	160.9	138.2	130.6
Relative of means	100.0	99.8	102.0	111.1	108.7	94.5	103.9	101.4	163.7	151.8	154.6	134.4	121.2

APPENDIX 3: cont

Item/method	1993							1994					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Cauliflower													
Geometric mean	100.0	61.2	76.2	102.2	106.2	106.6	120.7	113.0	139.5	188.0	93.0	138.3	95.1
Mean of relatives	100.0	65.0	81.9	105.0	113.3	110.9	125.7	117.6	155.6	198.4	100.3	146.8	115.9
Relative of means	100.0	59.2	72.8	98.5	101.4	101.4	114.9	107.6	138.0	183.3	89.8	135.3	97.7
Carrots													
Geometric mean	100.0	84.0	70.9	72.5	71.6	77.6	83.1	86.5	82.6	80.9	77.9	76.7	76.5
Mean of relatives	100.0	85.1	75.2	73.9	74.2	80.6	84.8	91.7	83.1	81.7	79.5	78.8	77.8
Relative of means	100.0	83.5	72.6	73.3	73.9	78.4	83.1	87.4	82.7	81.2	78.8	78.0	77.2
Onions													
Geometric mean	100.0	113.0	117.8	131.3	135.7	128.7	103.9	81.5	79.9	72.9	74.0	74.0	70.3
Mean of relatives	100.0	113.5	118.3	131.9	137.8	132.6	105.5	82.4	82.1	74.5	75.4	75.4	72.5
Relative of means	100.0	113.6	117.9	131.2	136.5	131.1	105.5	81.9	81.0	74.2	75.0	75.0	72.4
Lettuce													
Geometric mean	100.0	123.5	151.7	125.2	96.5	89.1	111.0	123.3	144.5	136.3	142.7	150.0	149.6
Mean of relatives	100.0	129.3	154.1	128.7	101.9	91.1	111.9	128.0	151.0	147.7	149.1	154.0	153.6
Relative of means	100.0	123.9	149.3	125.3	99.9	90.6	110.8	124.5	143.1	136.8	142.4	148.9	146.8
Tomatoes													
Geometric mean	100.0	84.5	131.1	157.2	162.7	142.9	224.7	145.5	151.5	226.7	134.8	132.1	165.5
Mean of relatives	100.0	85.7	132.8	159.4	167.1	144.6	226.4	152.2	159.5	233.0	138.9	133.9	172.4
Relative of means	100.0	85.4	131.2	157.7	161.5	143.1	221.4	155.5	158.0	224.7	136.3	132.1	166.3
Pumpkin													
Geometric mean	100.0	96.1	105.4	107.5	106.4	108.8	107.7	109.8	107.7	105.4	93.4	107.7	100.6
Mean of relatives	100.0	96.8	105.6	107.7	106.6	109.2	108.0	110.1	108.0	105.9	97.9	108.3	102.1
Relative of means	100.0	97.1	105.8	107.9	106.8	109.7	107.8	109.7	107.8	105.8	98.1	107.8	101.9
Mushrooms													
Geometric mean	100.0	101.2	104.0	100.2	97.9	105.2	106.2	101.4	102.4	107.5	102.4	104.7	102.4
Mean of relatives	100.0	101.8	105.1	101.4	99.8	106.9	108.1	101.5	102.9	109.0	104.7	105.3	103.4
Relative of means	100.0	100.3	102.5	98.8	96.8	103.6	104.7	101.4	101.4	105.9	101.4	103.6	101.4

Note: Shaded cells indicate imputed numbers.

APPENDIX 4: Fresh fruit and vegetables sub-group where elementary aggregates calculated using geometric mean of price relatives formula.

Sub-group, expenditure class,component, elementary aggregate	1993 Jun	Jul	Aug	Sep	Oct	Nov	Dec	1994 Jan	Feb	Mar	Apr	May	Jun
Fresh fruit and vegetables	100.0	99.7	102.0	102.1	101.5	98.1	110.8	105.8	111.8	120.3	107.7	111.5	116.7
Fresh fruit	100.0	97.9	83.8	83.8	91.9	90.2	90.7	95.5	91.8	96.3	97.7	100.5	110.0
Citrus	100.0	93.5	81.7	99.9	111.2	106.6	105.9	101.8	104.3	106.1	106.6	131.6	120.8
Grapefruit	100.0	76.3	82.4	54.7	69.0	66.2	70.8	64.7	72.0	69.0	86.5	81.4	95.1
Oranges	100.0	105.8	85.3	113.9	121.9	115.9	113.0	110.8	112.0	113.7	108.3	149.8	124.2
Mandarins	100.0	67.8	71.1	83.7	103.2	101.5	104.3	96.0	99.3	103.8	112.1	106.1	124.6
Pomme	100.0	105.3	105.5	110.1	118.0	119.8	118.4	130.4	113.2	115.1	105.2	99.5	113.2
Apples	100.0	103.6	101.5	107.4	110.8	108.1	106.0	123.8	129.7	125.0	100.9	97.2	116.0
Pears	100.0	109.8	116.2	117.6	137.6	151.7	151.8	148.3	68.5	88.4	116.8	105.7	105.7
Stone	100.0	97.9	83.8	83.8	91.9	90.2	90.7	103.8	106.9	115.6	117.3	120.7	132.0
Peaches	100.0	97.9	83.8	83.8	91.9	90.2	90.7	105.1	104.5	112.5	114.1	117.4	128.4
Plums	100.0	97.9	83.8	83.8	91.9	90.2	90.7	99.0	116.0	127.4	129.2	133.0	145.5
Tropical	100.0	113.8	75.6	63.2	68.3	69.0	69.5	61.3	70.7	80.4	89.0	81.0	96.7
Bananas	100.0	114.0	74.3	61.2	67.1	67.7	67.6	59.6	68.9	78.9	88.3	80.3	96.8
Pineapples	100.0	105.8	119.3	126.8	107.4	109.7	131.3	116.3	128.4	127.0	111.1	104.9	90.8
Other	100.0	61.9	63.1	55.2	64.8	56.0	61.6	84.8	70.4	71.5	80.6	89.8	105.1
Watermelon	100.0	61.9	63.1	55.2	121.1	114.3	125.6	90.2	68.3	71.4	79.8	101.0	125.1
Strawberries	100.0	61.9	63.1	55.2	46.0	36.6	40.3	60.2	58.1	53.8	63.6	64.3	97.7
Grapes	100.0	61.9	63.1	55.2	46.0	36.6	40.3	115.5	89.7	96.8	105.4	117.0	99.4
Potatoes	100.0	106.4	92.6	88.0	94.1	89.2	93.1	76.8	89.9	77.0	79.3	76.5	87.4
Potatoes	100.0	106.4	92.6	88.0	94.1	89.2	93.1	76.8	89.9	77.0	79.3	76.5	87.4
Fresh vegetables	100.0	99.8	117.2	118.3	110.0	105.5	129.0	118.5	130.5	145.9	120.1	125.8	126.9
Green	100.0	93.4	100.9	110.9	104.4	104.4	114.1	121.5	145.4	159.6	125.5	138.5	121.3
Beans	100.0	113.8	121.9	118.0	100.1	107.5	120.5	130.2	144.1	143.9	135.7	131.4	126.5
Cabbages	100.0	108.2	103.4	114.1	102.5	108.4	96.2	155.0	140.0	140.9	136.1	170.6	176.4
Celery	100.0	99.2	101.2	110.3	110.2	92.8	102.8	99.3	160.4	153.9	152.8	132.3	120.9
Cauliflower	100.0	61.2	76.2	102.2	106.2	106.6	120.7	113.0	139.5	188.0	93.0	138.3	95.1
Root and bulb	100.0	90.4	81.2	85.4	85.7	88.9	87.7	85.4	82.0	79.1	77.0	76.1	75.1
Carrots	100.0	84.0	70.9	72.5	71.6	77.6	83.1	86.5	82.6	80.9	77.9	76.7	76.5
Onions	100.0	113.0	117.8	131.3	135.7	128.7	103.9	81.5	79.9	72.9	74.0	74.0	70.3
Salad	100.0	107.1	143.0	138.6	124.3	111.7	158.8	132.7	147.5	174.3	139.4	142.5	156.2
Lettuce	100.0	123.5	151.7	125.2	96.5	89.1	111.0	123.3	144.5	136.3	142.7	150.0	149.6
Tomatoes	100.0	84.5	131.1	157.2	162.7	142.9	224.7	145.5	151.5	226.7	134.8	132.1	165.5
Other	100.0	98.7	104.7	103.8	102.2	107.0	106.9	105.6	105.1	106.4	97.9	106.2	101.5
Pumpkin	100.0	96.1	105.4	107.5	106.4	108.8	107.7	109.8	107.7	105.4	93.4	107.7	100.6
Mushrooms	100.0	101.2	104.0	100.2	97.9	105.2	106.2	101.4	102.4	107.5	102.4	104.7	102.4

Note: Shaded cells indicate imputed numbers.

APPENDIX 5: Fresh fruit and vegetables sub-group where elementary aggregates calculated using arithmetic mean of price relatives formula.

Sub-group, expenditure class,component, elementary aggregate	1993 Jun	Jul	Aug	Sep	Oct	Nov	Dec	1994 Jan	Feb	Mar	Apr	May	Jun
Fresh fruit and vegetables	100.0	102.7	105.0	105.0	105.4	101.0	113.5	110.7	117.2	126.4	112.4	115.2	122.2
Fresh fruit	100.0	101.9	87.8	87.5	96.4	94.4	95.0	101.8	97.8	102.2	103.1	105.9	116.1
Citrus	100.0	105.6	94.1	111.3	125.2	121.2	117.1	116.1	118.5	120.1	118.6	144.9	134.3
Grapefruit	100.0	83.0	88.8	60.1	74.5	70.0	75.9	65.9	73.6	70.2	89.6	87.0	96.4
Oranges	100.0	122.8	102.0	129.1	140.6	135.9	127.5	130.9	131.9	133.3	124.4	168.8	144.2
Mandarins	100.0	68.6	74.6	87.8	108.2	106.3	109.3	100.6	104.1	108.8	117.5	107.5	126.0
Pomme	100.0	108.8	108.9	112.7	121.8	122.4	122.9	138.8	120.7	122.3	113.6	107.2	120.0
Apples	100.0	107.3	103.9	109.4	114.3	109.6	109.1	131.9	138.1	132.2	108.9	106.2	122.3
Pears	100.0	112.9	122.3	121.6	141.8	157.0	160.4	157.6	73.8	95.5	126.5	110.0	113.8
Stone	100.0	101.9	87.8	87.5	96.4	94.4	95.0	110.6	108.8	116.6	117.6	120.8	132.4
Peaches	100.0	101.9	87.8	87.5	96.4	94.4	95.0	111.9	106.1	112.8	113.8	116.9	128.1
Plums	100.0	101.9	87.8	87.5	96.4	94.4	95.0	105.5	119.1	130.8	132.0	135.5	148.6
Tropical	100.0	114.3	76.6	63.8	69.2	69.7	70.2	62.9	72.7	82.0	90.2	81.9	100.5
Bananas	100.0	114.5	75.2	61.8	67.9	68.4	68.2	61.3	70.8	80.6	89.3	81.0	100.6
Pineapples	100.0	106.7	120.1	127.7	109.9	111.2	132.5	117.2	132.8	130.1	118.9	110.9	97.0
Other	100.0	62.5	63.6	56.5	65.6	56.6	63.4	85.8	72.3	75.1	82.4	91.9	107.6
Watermelon	100.0	62.5	63.6	56.5	121.6	114.9	126.0	91.4	68.9	72.2	80.5	103.5	127.5
Strawberries	100.0	62.5	63.6	56.5	46.9	37.2	42.5	61.1	60.1	60.1	65.2	66.8	101.4
Grapes	100.0	62.5	63.6	56.5	46.9	37.2	42.5	116.3	92.4	98.7	108.4	118.1	100.2
Potatoes	100.0	106.9	93.9	89.5	95.5	90.5	93.6	78.2	92.9	78.9	80.0	77.7	88.1
Potatoes	100.0	106.9	93.9	89.5	95.5	90.5	93.6	78.2	92.9	78.9	80.0	77.7	88.1
Fresh vegetables	100.0	102.6	119.8	120.7	113.7	107.7	130.9	122.9	136.0	152.8	125.0	128.7	132.7
Green	100.0	96.6	104.8	114.0	108.1	107.1	117.8	126.4	153.9	169.6	132.3	143.1	133.3
Beans	100.0	117.2	124.5	121.1	100.7	108.2	123.3	135.1	147.5	155.3	141.8	132.6	131.9
Cabbages	100.0	111.0	104.6	115.8	105.1	111.1	100.0	162.4	142.8	145.0	141.4	173.1	188.5
Celery	100.0	101.6	106.1	114.7	114.7	96.7	106.1	103.3	169.2	163.9	160.9	138.2	130.6
Cauliflower	100.0	65.0	81.9	105.0	113.3	110.9	125.7	117.6	155.6	198.4	100.3	146.8	115.9
Root and bulb	100.0	91.4	84.7	86.6	88.2	92.1	89.3	89.7	82.9	80.1	78.6	78.0	76.6
Carrots	100.0	85.1	75.2	73.9	74.2	80.6	84.8	91.7	83.1	81.7	79.5	78.8	77.8
Onions	100.0	113.5	118.3	131.9	137.8	132.6	105.5	82.4	82.1	74.5	75.4	75.4	72.5
Salad	100.0	111.0	145.2	141.6	129.3	113.5	160.0	138.2	154.5	183.5	144.8	145.5	161.5
Lettuce	100.0	129.3	154.1	128.7	101.9	91.1	111.9	128.0	151.0	147.7	149.1	154.0	153.6
Tomatoes	100.0	85.7	132.8	159.4	167.1	144.6	226.4	152.2	159.5	233.0	138.9	133.9	172.4
Other	100.0	99.3	105.3	104.6	103.2	108.0	108.1	105.8	105.5	107.5	101.3	106.8	102.7
Pumpkin	100.0	96.8	105.6	107.7	106.6	109.2	108.0	110.1	108.0	105.9	97.9	108.3	102.1
Mushrooms	100.0	101.8	105.1	101.4	99.8	106.9	108.1	101.5	102.9	109.0	104.7	105.3	103.4

APPENDIX 6: Fresh fruit and vegetables sub-group where elementary aggregates calculated using relative of arithmetic mean prices formula.

Sub-group, expenditure class,component, elementary aggregate	1993 Jun	Jul	Aug	Sep	Oct	Nov	Dec	1994 Jan	Feb	Mar	Apr	May	Jun
Fresh fruit and vegetables	100.0	99.3	101.8	102.0	101.5	98.0	109.9	106.9	112.8	120.2	108.0	112.2	116.9
Fresh fruit	100.0	97.3	83.9	83.0	90.7	88.8	89.9	95.7	92.8	96.2	97.4	102.1	110.6
Citrus	100.0	90.2	80.6	95.1	105.2	100.7	101.2	95.7	98.1	100.2	100.5	134.0	115.9
Grapefruit	100.0	82.3	86.9	62.6	75.1	71.7	77.0	67.6	74.0	72.1	87.0	87.1	94.7
Oranges	100.0	98.9	82.5	104.7	110.4	104.7	103.4	99.7	101.0	103.0	97.7	152.0	116.2
Mandarins	100.0	69.9	72.2	85.2	106.3	104.5	107.5	98.9	102.3	107.0	115.5	107.3	126.2
Pomme	100.0	105.4	105.2	109.9	117.3	118.7	117.6	133.5	118.8	116.0	107.3	103.2	114.6
Apples	100.0	104.5	102.0	106.9	110.4	107.2	106.1	126.5	134.3	126.4	104.2	102.2	117.8
Pears	100.0	107.9	113.9	118.0	136.1	149.8	148.8	152.4	76.7	87.9	115.6	106.0	106.0
Stone	100.0	97.3	83.9	83.0	90.7	88.8	89.9	103.3	106.7	114.8	116.2	121.8	132.0
Peaches	100.0	97.3	83.9	83.0	90.7	88.8	89.9	103.9	103.9	111.1	112.5	117.9	127.8
Plums	100.0	97.3	83.9	83.0	90.7	88.8	89.9	100.9	117.1	128.6	130.2	136.4	147.8
Tropical	100.0	113.4	77.2	64.1	69.5	69.6	70.2	63.0	72.8	82.3	89.1	80.9	100.9
Bananas	100.0	113.6	75.9	62.1	68.4	68.4	68.4	61.3	70.9	80.8	88.2	79.9	101.0
Pineapples	100.0	105.9	119.4	126.3	107.8	109.6	129.8	116.1	132.8	131.6	118.5	114.6	99.1
Other	100.0	62.6	62.6	55.2	64.5	56.5	62.8	85.7	71.2	73.5	83.1	89.8	105.0
Watermelon	100.0	62.6	62.6	55.2	120.7	114.5	125.1	92.4	69.9	73.0	81.9	101.3	126.0
Strawberries	100.0	62.6	62.6	55.2	45.8	37.2	42.0	61.0	57.4	57.4	67.0	64.2	96.6
Grapes	100.0	62.6	62.6	55.2	45.8	37.2	42.0	115.4	91.8	96.8	106.9	116.9	100.2
Potatoes	100.0	105.2	94.6	91.3	96.5	92.1	94.6	77.9	92.0	80.0	81.1	79.0	87.7
Potatoes	100.0	105.2	94.6	91.3	96.5	92.1	94.6	77.9	92.0	80.0	81.1	79.0	87.7
Fresh vegetables	100.0	99.7	116.4	118.1	110.5	105.9	127.6	120.4	131.3	145.2	120.6	125.5	126.6
Green	100.0	92.1	99.4	109.2	102.6	103.3	111.6	119.6	145.1	157.9	124.8	137.9	121.9
Beans	100.0	112.3	120.4	116.4	100.8	108.1	118.4	128.4	141.3	144.5	136.2	131.4	125.0
Cabbages	100.0	106.4	102.7	113.3	100.9	109.0	95.4	155.6	144.3	140.3	134.3	169.8	178.1
Celery	100.0	99.8	102.0	111.1	108.7	94.5	103.9	101.4	163.7	151.8	154.6	134.4	121.2
Cauliflower	100.0	59.2	72.8	98.5	101.4	101.4	114.9	107.6	138.0	183.3	89.8	135.3	97.7
Root and bulb	100.0	90.1	82.6	86.1	87.7	90.0	88.0	86.2	82.4	79.6	78.0	77.4	76.2
Carrots	100.0	83.5	72.6	73.3	73.9	78.4	83.1	87.4	82.7	81.2	78.8	78.0	77.2
Onions	100.0	113.6	117.9	131.2	136.5	131.1	105.5	81.9	81.0	74.2	75.0	75.0	72.4
Salad	100.0	107.7	141.7	138.9	125.7	112.6	157.3	137.5	149.4	173.7	139.8	141.8	155.0
Lettuce	100.0	123.9	149.3	125.3	99.9	90.6	110.8	124.5	143.1	136.8	142.4	148.9	146.8
Tomatoes	100.0	85.4	131.2	157.7	161.5	143.1	221.4	155.5	158.0	224.7	136.3	132.1	166.3
Other	100.0	98.7	104.2	103.3	101.8	106.7	106.3	105.5	104.6	105.9	99.7	105.7	101.7
Pumpkin	100.0	97.1	105.8	107.9	106.8	109.7	107.8	109.7	107.8	105.8	98.1	107.8	101.9
Mushrooms	100.0	100.3	102.5	98.8	96.8	103.6	104.7	101.4	101.4	105.9	101.4	103.6	101.4

Note: Shaded cells indicate imputed numbers.