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## Scanner data – comparability issues

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### *For discussion*

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At the latest meeting of the Swedish CPI Board in fall 2011, the question of unweighted geometric versus weighted arithmetic mean values was specifically asked to be investigated in the aggregation of scanner data. If we have access to price data per transaction, day or week, what should be the choice of aggregation method?

The Price Unit was also asked to highlight the treatment of different discounts in the scanner data. The regulations and recommendations on the treatment of discounts in the scanner data were not written with scanner data in mind. The question here is which approach we should have?

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## 1. Introduction

In the coming years, more and more Statistical Offices will be able to study and secure scanner data. Sweden would like to emphasize that it is of utmost importance to set guidelines on how cash register data can and should be treated. In the long run, this might lead to cost savings for many countries.

In this paper, we will highlight a number of practical issues that we believe are of important for the further work. By addressing the issues at an early stage, we hope to come to an agreement over the direction the statistical authorities should take. One factor that should be noted is the treatment of member discounts. According to what is written in the current Eurostat regulation concerning price collection, prices with member discounts should not be included in the computation of index unless it is significant.

Another issue that we want to emphasize is the reviewing of the cash register data. For countries that already use scanner data an appropriate harmonized and consistent reviewing methodology process should be established, to ensure the quality of data.

## 2. Observed features in scanner data – January to March 2012

The implementation of scanner data in the price index calculations of the daily necessities in CPI as from January 2012 seems not to have resulted in any significant effects on index numbers but indications of higher statistical quality.

As a preventive measure, manual price collection was undertaken parallel to scanner data collection during December 2011 and January 2012, which allowed for one final cross checking of data, similar to the thorough analyses of scanner data for the years 2009 and 2010. Comparisons were made of the January 2012 index for daily necessities in the two collection modes and there were found no apparent differences between the two modes of data, neither on micro nor aggregated levels, i.e. index, for the 88 product groups containing daily necessities.

At the latest meeting of the Swedish CPI Board in fall 2011, the question of unweighted geometric versus weighted arithmetic mean values was specifically asked to be investigated in the aggregation of scanner data. Scanner data are collected on a weekly basis three times a month, unlike manually collected prices which were surveyed one specific week during the month. Hence, scanner data must be aggregated to one monthly observation, and so far we have used a geometric mean value. Upon the request, we have made a smaller investigation of the empirical differences between two possible mean value computations, given the amount of data for year 2012.

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## 2.1 Price variation within weeks and months

The analysis of the twelve weeks used in this paper, which amounts to 100 000 price observations, rendered that more than 98 per cent of observations appear as being weekly prices without variation between days, where as about 1 per cent of observations seemed to be averages of two or more prices during the week. On monthly basis there were some 35 000 observations of which around 9 per cent showed to have different prices in the three weeks in the month. This means that the retail trade, at least this outlet chain, changes prices from Sunday to Monday in general.

## 2.2 Unweighted geometric mean versus weighted arithmetic mean

There is an obvious need of aggregating the (maximally) three data points for each combination of *month*, *product* and *outlet* to one. The discussions here concern, as outlined, mean value computations of the three collected weekly prices for each outlet and each month. Two methods have appeared as interesting to investigate further; unweighted geometric mean values and quantity weighted arithmetic mean values.

- The geometric mean value is used when price quotas are aggregated to the elementary index per month, product group and outlet stratum. Considering week as another dimension, parallel to outlet, which must be aggregated, this is the obvious choice of method. If we have access to price data per transaction, day or week, what should be the choice of aggregation method?
- The weighted arithmetic mean value is the method used by the provider of scanner data to aggregate individual transactions to weekly averages. The reported price per week is the revenue divided by number of packages sold. To use this method to aggregate week to month is merely to achieve a consistent method to aggregate prices for individual transactions to monthly averages.

There is significant price elasticity in this market, now possible to analyze. The effect of variation in prices appears more frequently in lower weighted arithmetic mean prices than unweighted geometric mean prices.

### 2.2.1 The ratio of the two mean values

We start by studying basic ratios constructed according to the two methods of interest. Denote the price ratio between the unweighted geometric mean

and the weighted arithmetic mean as  $R_A^G = \frac{P_t^G}{P_t^A}$ , where  $P_t^G$  is the geometric

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mean value for a product observed in an outlet in the sample in either  $t=January, February$  or  $March$  and  $P_t^A$  is the arithmetic analogue. We omit subscribing product and outlet of  $R_A^G$ . The same analogy goes for the base

price ratio  $Rb_A^G = \frac{P_{Base}^G}{P_{Base}^A}$ . We have approximately 8 500 price observations

each week, three months of data and one base month which make four months in all. In terms of mean values, this makes up about 8 500 price observations each month. Due to potential disclosure issues, we restrict our reporting of the results to the following three clear cases.

- In 2 per cent of cases, the geometric mean price in the base month was significantly larger than the arithmetic mean, i.e.  $Rb_A^G > 1$ , while the mean prices the other months were identical,  $R_A^G = 1$ ;  $Rb_A^G > 1 \& R_A^G = 1$ .
- In 3 per cent of cases, the base prices were equal for the two methods ( $Rb_A^G = 1$ ) while the geometric mean significantly exceeded the arithmetic,  $R_A^G > 1$ , in any of the other months;  $Rb_A^G = 1 \& R_A^G > 1$ .
- More than 90 per cent of observations were based on unchanged monthly prices, i.e.;  $Rb_A^G = 1 \& R_A^G = 1$ .

Some of the largest discrepancies, in terms of  $R_A^G$  and  $Rb_A^G$  were found primarily in product groups Mixed meat products (1233) and Cheese (1418-1419).

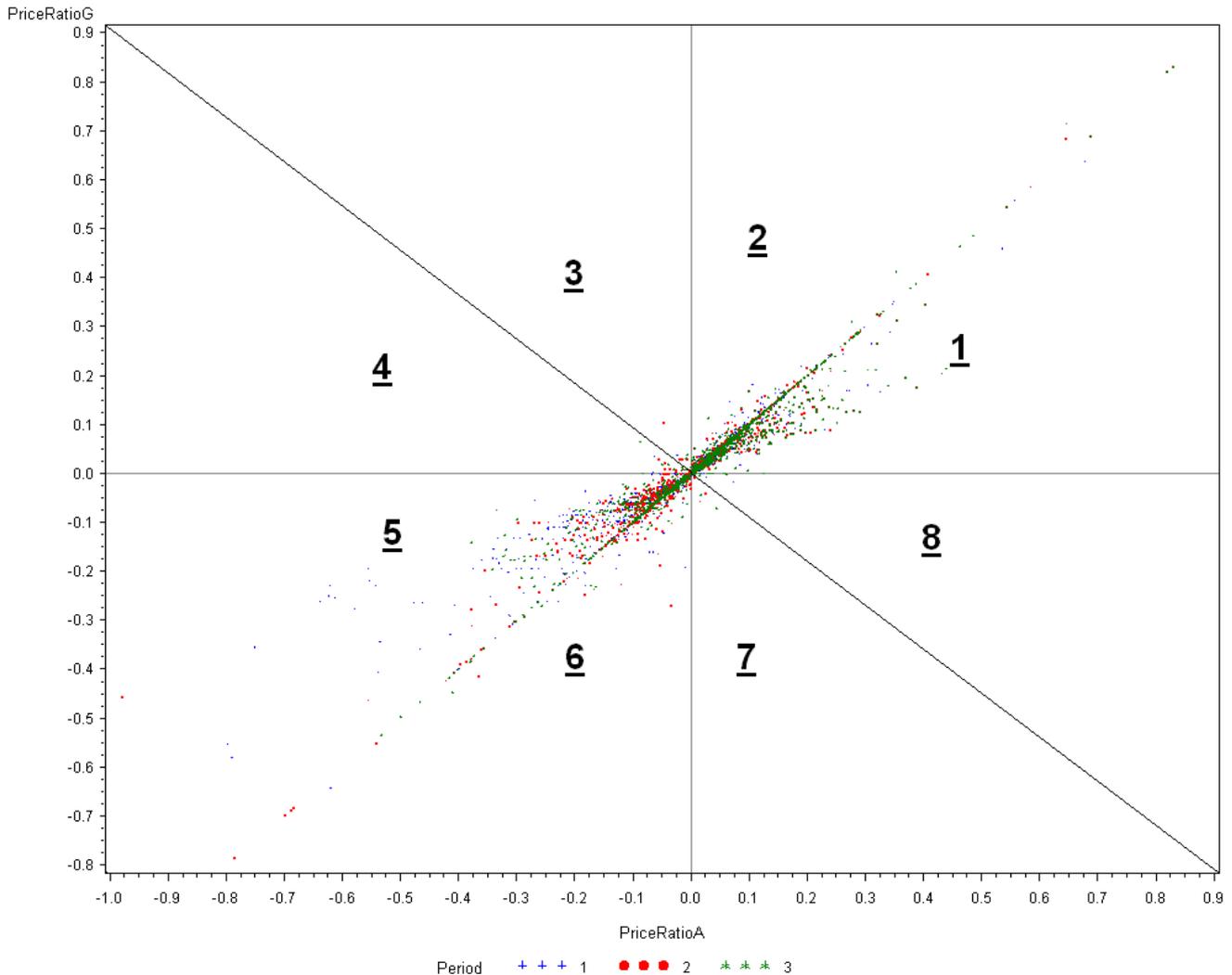
### 2.2.2 Logarithmic price ratios used in index

We now illustrate the two methods as monthly observations of price ratios of current monthly price in relation to the analogue base price, i.e.  $\log(P_t^G / P_{Base}^G)$  and  $\log(P_t^A / P_{Base}^A)$ . In figure 2.1, the logarithmic price ratio is graphed as a scatter plot between the two methods, i.e. geometric versus arithmetic.

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**Figure 2.1: Logarithmic ratios of mean prices in current month relative to base period. Unweighted geometric mean on vertical axis and weighted arithmetic mean on horizontal axis. Eight sectors are numbered for analysis purposes.**



Considering figure 2.1, there is a total concordance between arithmetic and geometric mean values for more than 90 per cent of observations and a concentration in the origin exists, not being visible here. The main conspicuous features seem to be the dense areas in sector 1 below the 45 degree “line” i.e.  $\log(P_t^G / P_{Base}^G) = \log(P_t^A / P_{Base}^A)$ , on which ratios are equal, and in sector 5 above the 45 degree “line”. These two sectors represent the two features of data as mentioned earlier but with another perspective. In sector 1, we find the 2 per cent of observations where the geometric mean price in the base month was larger than was the arithmetic mean, generally explained by a one week of low prices there. To clarify, the situation in sector 1 occurs when the base price calculated arithmetically is less than its geometric analogue,  $P_B^A < P_B^G$  so the ratio between the two methods

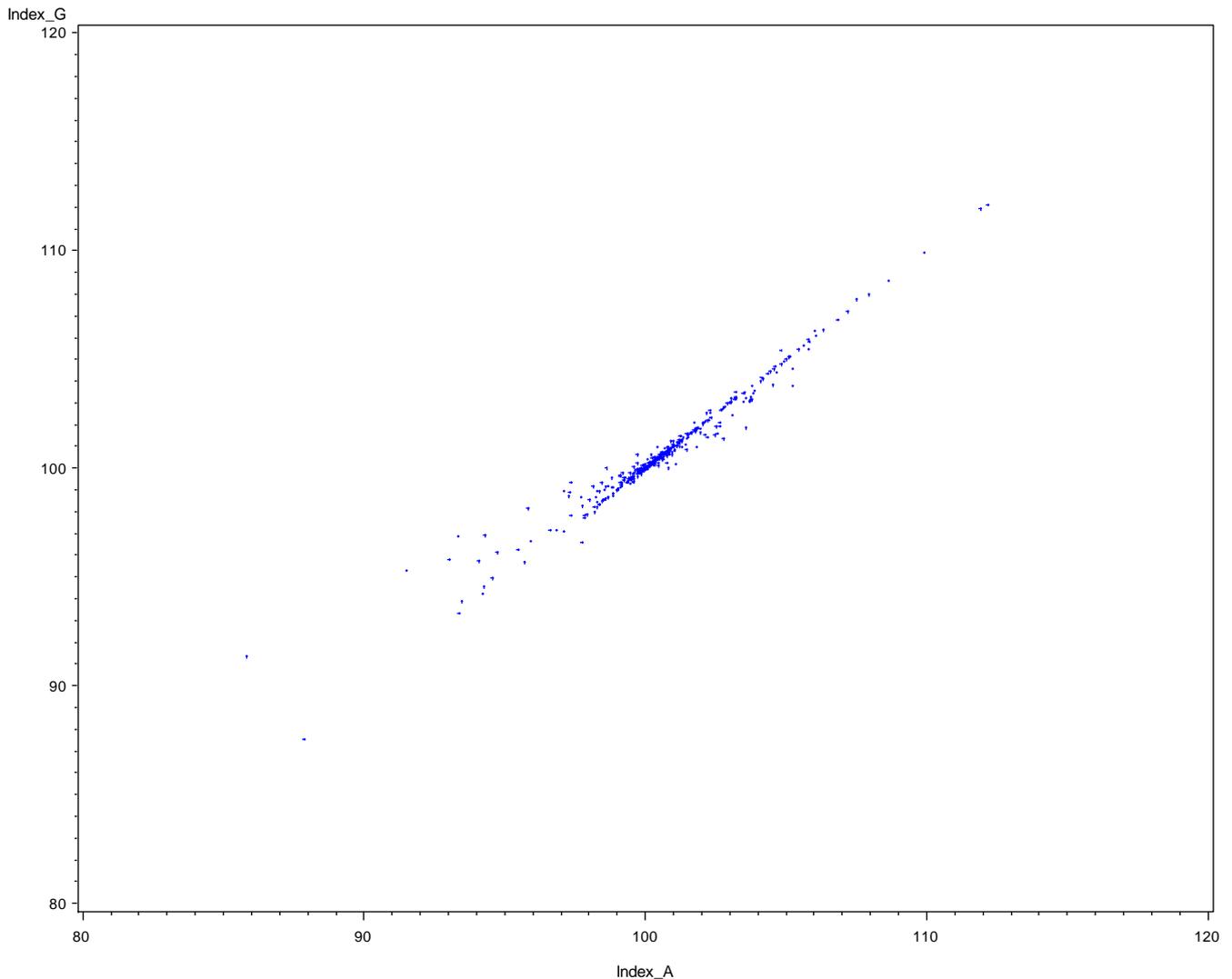
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becomes smaller than one,  $((P_t^G / P_B^G) / (P_t^A / P_B^A)) < 1$  and thus below the 45 degree “line”. Since the arithmetic mean value base price is lower than the geometric analogue, the price ratio becomes larger for arithmetic mean value.

In sector 5, we find the 3 per cent of observations where the geometric mean price in the January-March month was larger than was the arithmetic mean,  $P_t^G > P_t^A$ , which meant that the price increase relative to the base price was larger for the geometric mean than for the arithmetic mean, hence above the 45 degree “line”.

**Figure 2.2. Monthly price indices for product groups in supermarkets and hypermarkets, based on geometric and arithmetic mean prices per month**



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When index values are aggregated to daily necessities in total, i.e. all price ratios on most detailed level are summarized for each sector, the difference between the two computation methods tend fade out (figure 2.2).

### **2.2.3 Differences in index between the two methods and manually collected prices**

As mentioned earlier, parallel collection in December 2011 and January 2012 allowed for comparisons of scanner data and manually collected prices. Our calculations of index yielded the following. For January, the arithmetic mean value based index was 0.186 index units below the index based on the geometric means (index is around 100). The manually collected data index was 0.135 index units below the geometric mean based index. For February and March, where we only had the scanner mode, the two computation methods rendered identical index values up to the second decimal. On the third decimal, February and March indices showed that either the geometric or arithmetic mean based index was larger. The only difference between the two methods was thus observed for January.

### **2.2.4 Quality of data by indicators from output (macro) editing**

In the monthly output (macro) editing of the 88 product groups containing daily necessities, on average six product groups failed per month in 2011, i.e. they were flagged to be suspected. For January 2012 only one product group was flagged, in February two product groups were flagged and in March four product groups were flagged as suspected to be in error. One product that was flagged in both January - March 2012 was tobacco due to changes in taxes on tobacco and thus was not related to the collection method or temporary effects. A conclusion is that the cash register data result in more stable macro-data than the corresponding manually collected data did last year. One explanation for this is that we usually have three measured prices per month per store and product, rather than only one. Another explanation may simply be a higher quality of data.

## **3. Purchaser prices**

The Price Unit was asked by the Swedish CPI Board to highlight the treatment of different discounts in the scanner data. In section 3, we will make an attempt to bring some clarity to the definition of “price” that should be included in the CPI.

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### 3.1 The review of the Swedish Consumer Price Index (SOU 1999:124)

In December 1997 the Swedish Ministry of Finance decided to conduct a review of the Consumer Price Index.<sup>1</sup> Mr. Alf Carling was appointed to form a team of experts and lead the work.<sup>2</sup> In his responsibilities was included, among others, highlighting the need for price indices for different purposes and define the precise guidelines for some specific areas to facilitate the interpretation of the principal reasons that were proposed. The report was completed in June, 1999.

It was stated in the report that the price index for household consumption should measure the effect of price changes. A further note was that such an index was consistent with the economic index theory. It was also stated that the full price to be paid by households for consumer goods and services should be perceived as cost of consumption, even though some of the price consisted of indirect taxes.<sup>3</sup> In one section one can also read that in some cases it is not easy to measure the actual price paid by consumers. The reason for that is the various types of hidden discounts, such as rebates, bonuses, coupons for groceries and gasoline.<sup>4</sup>

### 3.2 HICP regulations

The Council of the European Union adopted a regulation on the 23th of October 1995 where the legal basis for the harmonized methodology for compiling consumer price indices (CPIs) in EU Member States was set up.<sup>5</sup> The aim of the Regulation was to establish the statistical bases necessary for arriving at the calculation of comparable indices of consumer prices at Community level for all the EU Member States.<sup>6</sup>

Since the first regulation was established concerning the harmonized indices of consumer prices (HICP), several new regulations have been adopted by both the European Council and the European Commission. Frameworks and rules as well as guidelines or non-obligatory statements of good practice have been drawn up in collaboration with Member States for the construction of HICPs.

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<sup>1</sup> The latest in a series of audits of the Swedish Consumer Price Index.

<sup>2</sup> The team included Mats Haglund and Jörgen Dalén among others.

<sup>3</sup> SOU 1999:124, s 29.

<sup>4</sup> SOU 1999:124, s 292.

<sup>5</sup> Council Regulation (EC) No 2494/95.

<sup>6</sup> Compendium of HICP - reference documents (2/2001/B/5) - GUIDELINES FOR THE TREATMENT OF REDUCED PRICES IN THE HARMONIZED INDEX OF CONSUMER PRICES (HICP) - p 16-19

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Regarding prices in the HICP, it is clear that rebates and other discounts should be deducted, if the opinion of the European Central Bank should be accounted for. In the Commission regulation (EC) No. 2602/2000 one can initially read the following; *There is considerable scope for procedural differences in the treatment of price reductions and the relationship between price reductions and purchase price. A harmonised methodology for the treatment of price reductions in the HICP is necessary to ensure that the resulting HICPs meet the comparability requirement of Article 4 of Regulation (EC) No 2494/95. It will also improve their reliability and relevance.* Then further on one can read; *Prices used in the HICP should be purchaser prices actually paid by households to purchase individual goods and services in monetary transactions, including any taxes less subsidies on the products, after deductions for discounts for bulk or offpeak-purchases from standard prices or charges, and excluding interest or services charges added under credit arrangements and any extra charges incurred as a result of failing to pay within the period stated at the time the purchases were made.*<sup>7</sup>

In Article 1 the Council Regulation (EC) No. 1687/98 written on the topic of price deduction this can be read; *Prices used in the HICP are the purchase prices paid by households to purchase individual goods and services in monetary transactions. Where goods and services have been available to consumers free of charge, and subsequently an actual price is charged, then the change from a zero price to the actual price, and vice versa, should be taken into account in the HICP.*<sup>8</sup>

In Article 2 in the Commission regulation (EC) No. 2602/2000 on purchaser prices this can be found. *Unless otherwise stated purchaser prices used in the HICP shall in general take account of reductions in prices of individual goods and services if such reductions:*

- (a) can be attributed to the purchase of an individual good or service; and*
- (b) are available to all potential consumers with no special conditions attached (non-discriminatory);*
- (c) are known to the purchaser at the time when they enter into the agreement with the seller to purchase the product concerned; and*
- (d) can be claimed at the time of purchase or within such a time period following the actual purchase that they might be expected to have a significant influence on the quantities purchasers are willing to purchase. In particular, reductions in the prices of individual goods and services which are likely or expected to be available again at standard prices or are*

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<sup>7</sup> COMMISSION REGULATION (EC) No 2602/2000 of 17 November 2000 laying down detailed rules for the implementation of Council Regulation (EC) No 2494/95 as regards minimum standards for the treatment of price reductions in the Harmonised Index of Consumer Prices (\*)

<sup>8</sup> COUNCIL REGULATION (EC) No 1687/98 of 20 July 1998 amending Commission Regulation (EC) No 1749/96 concerning the coverage of goods and services of the harmonised index of consumer prices (\*) - Article 1

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*available elsewhere at standard prices shall be taken into account in the HICP. Standard price means the price without any conditions or qualifications and not described as a special price.*<sup>9</sup>

### 3.3 Consumer price index manual: Theory and practice

The Governing Body of The International Labour Office (ILO) convened The International Conference of Labour Statisticians (ICLS) for the first time in 1923 with 52 participants from 33 countries and the League of Nations. The purpose of the Conference was to create a natural forum for experts to discuss CPI methodology and develop guidelines for CPI producers. In 1998 ILO in cooperation with International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the Statistical Office of the European Communities (Eurostat), the United Nations Economic Commission for Europe (UNECE) and the World Bank, together with experts from a number of national statistical offices and universities came together and developed a manual for CPI compilation. The purpose of the manual is to give an overview of the conceptual and theoretical issues that statistical offices might need when they tackle various problems in the compilation of a CPI. The International CPI Manual was issued in complete form in 2004 and has continuously been revised.<sup>10</sup>

The following is said in the manual regarding rebates and discounts.

*In paragraph 3.138 in the Consumer price index manual one can read “CPIs should take into account the effects of rebates, loyalty schemes, and money-off vouchers. Given that a CPI is meant to cover all the reference households, whether in the country as a whole or in a particular region, discounts should be included even if they are available only to certain households or to consumers satisfying certain payment criteria.”*<sup>11</sup>

*In paragraph 6.80 one can find “One of the principles relating to consumer price indices, which is applied with few exceptions (such as owner-occupier housing costs), is that only transaction prices, that is prices actually paid by individuals or households, should be included in the index. This may differ from the advertised price if, for example, a discount is offered.” Under the same paragraph the authors continue to write “In practice, however, discriminatory discounts, which are available only to a restricted group of*

<sup>9</sup> COMMISSION REGULATION (EC) No 2602/2000 of 17 November 2000 laying down detailed rules for the implementation of Council Regulation (EC) No 2494/95 as regards minimum standards for the treatment of price reductions in the Harmonised Index of Consumer Prices (\*) – Article 2

<sup>10</sup> ILO/IMF/OECD/UNECE/Eurostat/The World Bank, Consumer price index manual: Theory and practice, Geneva, International Labour Office, 2004

<sup>11</sup> ILO/IMF/OECD/UNECE/Eurostat/The World Bank, Consumer price index manual: Theory and practice, Geneva, International Labour Office, 2004

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*households (as opposed to non-discriminatory discounts that are available to all), are generally excluded on principle. For example, money-off coupons and loyalty rewards for previous expenditure are normally ignored and the non-discounted price is recorded.”* How should “are generally excluded on principle” be interpreted in this context?

Under paragraph 6.82 this text can be read “*Discounts available only to a restricted group of households should be disregarded because they are discriminatory, unless they are significant and are available either to the vast majority of the population or to identifiable subgroups who qualify for such discounts on the basis of demographic or other characteristics not requiring action by the individuals concerned at the time of purchase. In the latter case, they should be treated as stratification or coverage issues in item sampling.*” The lead term here, “*unless they are significant*” can be a window of opportunity for discussions on how to treat discriminatory discounts which are available to a significantly large, but yet restricted, group of households.

We will in the following section highlight the most common discounts and rebates that can be found in the retail industry. We will also clarify how the discounts are registered in the cash register system in one of the retail chains.

#### **4. Discounts**

In section 4, we will discuss the different kinds of discounts and at the same time display how they are treated in scanner data for two retail chains.

##### **4.1 Member card discounts**

“Membership” offers are for the moment a steadily growing marketing strategy used by retailers to attract consumers. This trend has grown and decentralized to new industries mostly because of a competitive market. By offering households “membership” within their retail chain, the household will gain different sorts of benefits.<sup>12</sup> Some examples of member benefits are premium checks, good membership prices and membership discounts in shops and supermarkets as well as offers on travel, hotels and various entertainments.

Further, two of Sweden’s retail chains within daily necessities do not just offer membership to individuals but also a wide range of financial services, which ties their customers more tightly to them. The banking services are conducted under the supervision of the Financial Supervisory Authority.

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<sup>12</sup> Membership is often attached with an entrance fee.

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Discussions between Statistics Sweden and two retail chains have rendered the following information. Both the chains have millions of households tied to them through membership cards which are used actively, however there is of course a large overlap of households having membership in both chains. Households might also have additional cards through the same chain, e.g. wife holds membership and provides additional card to the husband. According to one of the retail chains, 80% of all their sales, registered in 2011, were made by members. That number has increased in recent years largely because the retail chain has made it more profitable to their members.

If a purchaser is offered a discount through her member card on specific products, the rebate will be subtracted from the regular price of the specific product (similar to a sale). Refunds or other membership benefits relating to the purchase are subtracted from the total costs and are not allocated to specific products listed on the receipt.

According to the International CPI Manual membership discounts on specific product should not be included “*unless they are significant and are available either to the vast majority of the population or to identifiable subgroups who qualify for such discounts on the basis of demographic or other characteristics not requiring action by the individuals concerned at the time of purchase.*”<sup>13</sup> A similar text can be found in the HICP guidelines.<sup>14</sup> Relating this information to the preceding section of CPI compilation in the presence of discounts, we consider 3.2 million members to be a vast majority of the population.

#### In scanner data

For one of the studied chains, the price variable includes discounts from member cards and for the other chain it does not (due to technical reasons there may be failures of this standard).

## **4.2 Bonus offers (extras) like "buy 3 pay for 2"**

"Buy three, pay for two" is a common marketing strategy. The customers are offered to buy three products for the price of two.

From what is written in the International CPI Manual *Bonus offers, extras and free gifts* should be excluded from the price.<sup>15</sup> According to the HICP guidelines for the treatment of reduced prices, the product concerned *should*

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<sup>13</sup> ILO/IMF/OECD/UNECE/Eurostat/The World Bank, Consumer price index manual: Theory and practice, Geneva, International Labour Office, 2004 - *Paragraph 6.82*

<sup>14</sup> Compendium of HICP - reference documents (2/2001/B/5) - GUIDELINES FOR THE TREATMENT OF REDUCED PRICES IN THE HARMONIZED INDEX OF CONSUMER PRICES (HICP) - p 353 Practicability (6)

<sup>15</sup> ILO/IMF/OECD/UNECE/Eurostat/The World Bank - Consumer price index manual: Theory and practice - Geneva, International Labour Office, 2004 - *Paragraph 6.84*

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*be disregarded if they are not significant.*<sup>16</sup> This type of discount is included in the price variable for one of the studied chains and thus cannot be identified in the data. The question is if an exception can be made for the use of scanner data?

Another discount that is treated the same way in the cash register data as "buy 3 pay for 2" is multiple discounts (e.g. a store offers customers discounts for purchasing multiple items of same brand or product).

#### In scanner data

Prior to a campaign launch, the store personnel types in the EAN-codes of all three products that are included in the campaign into the cash register system. At the same time they register the total amount of the discount for the three products. The total discount for the three products will then be split proportionally over the goods. That is, when a customer buys three products for the price of two, the discount will automatically be registered and distributed over all three products. The same rule is applied when the component products have different regular prices. Note further that the offer does not necessary have to include the same sort of product.

### **4.3 Coupon discounts, issued by the seller or the supplier**

A coupon issued by the seller or the supplier is treated like any other means of payment.

#### In scanner data

The discount is deducted from the total sale. The price variable in scanner data does not include this sort of discounts on specific product items.

### **4.4 Sale**

Sales prices are most frequent for clothing and footwear but might appear in any product group.

#### In scanner data

Since scanner data are actual transaction data, prices due to sales are included and are thus not in conflict with compilation rules such as paragraph 6.80 in the International CPI Manual.

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<sup>16</sup> Compendium of HICP - reference documents (2/2001/B/5), GUIDELINES FOR THE TREATMENT OF REDUCED PRICES, IN THE HARMONIZED INDEX OF CONSUMER PRICES (HICP) - p 352 Practicability (3)

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#### 4.5 Stamps

A discount similar to the “bonus offers” discounts is stamps. After a purchaser has bought  $x$  amounts of a same product in several occasions, then she will get the  $x+1$ th item for free.

##### In scanner data

Uncommon in supermarkets and hypermarkets, but if they existed they would be treated the same way as the “Bonus offers”.

#### 4.6 “Close to best before date” - rebates

Sometimes products close to best-before-date are sold at reduced prices. Most often the same product with good best-before-date is sold at regular price in parallel.

##### In scanner data

We assume that it is not possible to identify any such transactions but for practical reasons the outlet has the regular price in the cash register system and the reduction is withdrawn manually.

### 5. Conclusions

Consideration has to be given to the treatment of discounts (such as rebates, loyalty schemes, and money-off vouchers) in scanner data and the method of aggregation of weekly data.

Our results in this paper regarding the mean value computation methods indicate that there are relatively small differences due to choice of mean value computation method.

Some clarifications need to be developed how to read Regulation (EC) No. 2602/2000 regarding use for scanner data.

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## APPENDIX 1 – Reference texts

**ILO/IMF/OECD/UNECE/Eurostat/The World Bank**

**Consumer price index manual: Theory and practice**

**Geneva, International Labour Office, 2004 -**

**Paragraph 3.138 – 3.143 + Paragraph 6.80 – 6.85 + 6.90**

### **Discounts, rebates, loyalty schemes and “free” products**

**3.138** CPIs should take into account the effects of rebates, loyalty schemes, and money-off vouchers.

Given that a CPI is meant to cover all the reference households, whether in the country as a whole or in a particular region, discounts should be included even if they are available only to certain households or to consumers satisfying certain payment criteria.

**3.139** It may be difficult to record discriminatory or conditional discounts for practical reasons. When only one selected group of households can enjoy a certain discount on a specific product, the original stratum for that product is split into two new strata, each experiencing different price changes and each requiring a weight. So, unless base period expenditures for all possible strata are known, it is not possible to record discriminatory discounts correctly. Similarly, with conditional discounts, e.g. discounts on utility bills for prompt payment, it can be difficult to record the effect of the introduction of such offers unless data are available on the proportion of customers taking advantage of the offer. These kinds of practical problems also arise when there is price discrimination and the sellers change the criteria that define the groups to whom different prices are charged, thereby obliging some households to pay more or less than before without changing the prices themselves. These cases are discussed further in Chapter 7.

**3.140** Although it is desirable to record all price changes, it is also important to ensure that the qualities of the goods or services for which prices are collected do not change in the process. While discounted prices may be collected during general sales seasons, care should be taken to ensure that the quality of the products being priced has not deteriorated.

**3.141** The borderline between discounts and rebates can be hazy and is perhaps best drawn according to timing. In other words, a discount takes effect at the time of purchase, whereas a rebate takes effect some time later. Under this classification, money-off vouchers are discounts, and as with the conditional discounts mentioned above, can only be taken into account in a CPI if they relate to a single product and if the take-up rate is known at the time of CPI compilation. Since this is highly unlikely, the effect of money-off vouchers is usually excluded from a CPI. It should be noted that the discount is recorded only when the voucher is used, not when the voucher is first made available to the consumer.

**3.142** Rebates may be made in respect of a single product, e.g. air miles, or may be more general, e.g. supermarket loyalty schemes where a \$10 voucher is awarded for every \$200 spent. As with discounts discussed above, such rebates can only be recorded as price falls if they relate to single products and can be weighted according to take-up. Bonus products provided “free” to the consumer, either by larger pack sizes or offers such as “two packs for the price of one”, should be treated as price reductions, although they may be ignored in practice when the offers are only temporary and quickly reversed. When permanent changes to pack sizes occur, quality adjustments should be made (see Chapter 7).

**3.143** Given the practical difficulties in correctly recording all these types of price falls, it is usual to reflect discounts and rebates only if unconditional, whereas loyalty schemes, money-off coupons, and other incentives are ignored. Discounts during seasonal sales may be recorded provided that the quality of the goods does not change.

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**COUNCIL REGULATION (EC) No 1687/98 of 20 July 1998 amending Commission Regulation (EC) No 1749/96 concerning the coverage of goods and services of the harmonised index of consumer prices (\*) - Article 1**

...

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community,

...

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Central Bank (2),

...

Whereas Commission Regulation (EC) No 1749/96 of 9 September 1996 on initial implementing measures for Council Regulation (EC) No 2494/95 concerning harmonised indices of consumer prices (3) sets down an initial coverage for HICPs that was restricted to those goods and services covered by all or most national consumer price indices (CPIs); whereas the prices to be taken for the HICP, in particular the treatment of subsidies, rebates and reimbursements, require harmonised definitions; whereas the geographic and population coverage of the HICPs need still to be specified;

Whereas Article 3 of Regulation (EC) No 2494/95 requires that the HICP be based on the prices of goods and services available for purchase in the economic territory of the Member State for the purposes of directly satisfying consumer needs; whereas prices not actually paid by consumers in such purchases or opportunity costs or interest payments are not appropriate for international comparisons of consumer price inflation;

...

**Article 1**

Regulation (EC) No 1749/96 shall be amended as follows:

...

3. subparagraph (a) of Article 2 shall be replaced by the following:

...

(a)(3) Prices used in the HICP are the purchase prices paid by households to purchase individual goods and services in monetary transactions. Where goods and services have been available to consumers free of charge, and subsequently an actual price is charged, then the change from a zero price to the actual price, and vice versa, should be taken into account in the HICP.

**COMMISSION REGULATION (EC) No 2602/2000 of 17 November 2000 laying down detailed rules for the implementation of Council Regulation (EC) No 2494/95 as regards minimum standards for the treatment of price reductions in the Harmonised Index of Consumer Prices (\*)**

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Regulation (EC) No 2494/95 of 23 October 1995 concerning harmonised indices of consumer prices (1), and in particular Article 4 in conjunction with Article 5(3) thereof,

After consulting the European Central Bank (2),

Whereas:

(1) By virtue of Article 5(1)(b) of Regulation (EC) No 2494/95, each Member State is required to produce a Harmonised Index of Consumer Prices (HICP) starting with the index for January 1997.

(2) There is considerable scope for procedural differences in the treatment of price reductions and the relationship between price reductions and purchase price. A harmonised methodology for the treatment of price reductions in the HICP is necessary to ensure that the resulting HICPs meet the comparability requirement of Article 4 of Regulation (EC) No 2494/95. It will also improve their reliability and relevance.

(3) Prices used in the HICP should be purchaser prices actually paid by households to purchase individual goods and services in monetary transactions, including any taxes less subsidies on the products, after deductions for discounts for bulk or offpeak-purchases from standard prices or charges, and excluding interest or services charges added under credit arrangements and any extra charges incurred as a result of failing to pay within the period stated at the time the purchases were made.

...

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**Article 2**

**Purchaser prices**

Unless otherwise stated purchaser prices used in the HICP shall in general take account of reductions in prices of individual goods and services if such reductions:

- (a) can be attributed to the purchase of an individual good or service; and
- (b) are available to all potential consumers with no special conditions attached (non-discriminatory);
- (c) are known to the purchaser at the time when they enter into the agreement with the seller to purchase the product concerned; and
- (d) can be claimed at the time of purchase or within such a time period following the actual purchase that they might be expected to have a significant influence on the quantities purchasers are willing to purchase. In particular, reductions in the prices of individual goods and services which are likely or expected to be available again at standard prices or are available elsewhere at standard prices shall be taken into account in the HICP. Standard price means the price without any conditions or qualifications and not described as a special price.

...

**Article 4**

**Specification change**

Where specification changes, prices shall be treated in accordance with the rules on specification changes, and in particular those regarding quality adjustment in Article 5 of Regulation (EC) No 1749/96.

**Price reductions**

**6.80** One of the principles relating to consumer price indices, which is applied with few exceptions (such as owner-occupier housing costs), is that only transaction prices, that is prices actually paid by individuals or households, should be included in the index. This may differ from the advertised price if, for example, a discount is offered. In practice, however, discriminatory discounts, which are available only to a restricted group of households (as opposed to non-discriminatory discounts that are available to all), are generally excluded on principle. For example, money-off coupons and loyalty rewards for previous expenditure are normally ignored and the non-discounted price is recorded. Also, it may be difficult to obtain the price paid if this is subject to individual bargaining. It may therefore not come as a surprise that, while the general rule above may appear simple, there are a number of instances requiring special treatment either because of conceptual issues or because of practical difficulties. The following guidelines reflect practices followed by a number of countries. They do not represent a set of rules because the appropriate practice to be followed will be determined by individual circumstances, which might vary between different countries.

**6.81** *Discounted prices* should only be taken if generally available to anyone with no conditions attached; otherwise the non-discounted or unsubsidized price is recorded. In particular, the general practice is to ignore money-off coupons and loyalty rewards. A judgement needs to be made, however, relating to the interpretation of "generally available". For instance, reduced prices for payment by direct debit may be taken into account depending on the extent to which consumers as a whole have access to and use such a service. A judgement is required in the latter case on the threshold to be set for access, above which action is taken for inclusion in the index. Alternatively, different payment methods may all be priced individually (for example, separate data collection for electricity payments by cash, direct debit and pre-payment) and weighted together to form a single price index for that item.

**6.82** *Price discrimination.* Discounts available only to a restricted group of households should be disregarded because they are discriminatory, unless they are significant and are available either to the vast majority of the population or to identifiable subgroups who qualify for such discounts on the basis of demographic or other characteristics not requiring action by the individuals concerned at the time of purchase. In the latter case, they should be treated as stratification or coverage issues in item sampling. Some judgement is required. Examples of allowable price discrimination may include lower prices offered to pensioners (for example, discounted travel or haircuts) and discounts for people who receive state benefits. Another example of a case where prices are not universally available to all, and where judgement is required, is where a nominal or token membership fee is required by the retail outlet. In these cases, the take-up of such membership – which is widely available to all – needs to be considered in terms of thresholds and general spending patterns of the consumers and the conditions placed on membership which may make the latter restrictive (for example, minimum levels of purchase). Ease of

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access to the outlets in question may be a relevant factor as well, say, if in practice the customers need to have the use of a private car.

**6.83** *Sale or special offer prices* should be recorded if these are either temporary reductions on goods that are likely to be available again at normal prices, or are stock-clearing sales (such as January sales or summer sales). Before designating a price as a “sale” price, however, special care should be taken to ascertain that there is a genuine sale with price reductions on normal stock. On occasion, stock is continually sold below the recommended retail price or advertised as a special offer even though these prices are available all year. In such cases, prices should not be considered as sale prices, but can still be collected. Special purchases of end-of-range, damaged, shop-soiled or defective goods should not normally be priced, as they are likely not to be the same quality as, or comparable with, goods previously priced and are unlikely to be available in future. If the special offer is limited to the first customers, the item should not be priced, as the offer is not available to everyone. Introductory special offers may be included if they are available to all. In reality, however, given the need to price the same “basket” each month, such offers will not be chosen as representative items unless they are introduced at the time of an update of the “basket” or when a replacement item needs to be chosen. Discounts on goods close to expiry dates should be disregarded or treated as specification or quality changes.

**6.84** *Bonus offers, extras and free gifts.* Prices for items temporarily bearing extra quantities (for example, 30 per cent extra free) should not be adjusted to take account of the increased quantity if it is thought that the extra quantities involved may not be wanted by most consumers, will not have influenced the decision to purchase or will not be consumed. Similarly, free items with other purchases (such as buy 2 get 1 free or free gift with every product purchased) should be disregarded. Money-off coupons for future purchases should be disregarded, as these may not be used or wanted. Free gifts such as plastic toys in cereal boxes should be ignored because they are not included in the list for price observations; it is the price to be paid to get the cereal in the box that is relevant. Collectors should be aware that temporary “special offer” weight changes (X per cent extra free) could become a permanent weight change (for example, cans of alcoholic drinks changing size from 440 ml to 500 ml) and should feed the information back to head office as they become aware of it. In this way, head offices can issue new or amended guidance to price collectors about item specifications.

**6.85** *Stamps.* Sometimes purchasers are given special stamps, which can be accumulated and subsequently exchanged for goods and services. If a discount is available as an alternative to such stamps, then the discounted price should be recorded. Otherwise, the stamps should be disregarded.

...

**6.90** *Irregular rebates or refunds* should only be taken into account when they apply to the purchase of an individual product and are granted within a time period such that they are expected to have a significant influence on the quantities purchasers are willing to buy. Loyalty rebates or coupons associated with previous expenditure at the outlet, to be used for similar or other purchases, should generally be disregarded, as they are discriminatory. If they are significant factors, they should be treated as stratification or coverage aspects of sampling (see Chapter 5). One-off rebates (for example, associated with privatization) should be disregarded as they do not relate to the specific time period of the consumption and are unlikely to affect levels of consumption. They can be viewed more as a source of additional income.

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**Compendium of HICP - reference documents (2/2001/B/5)**

**GUIDELINES FOR THE TREATMENT OF REDUCED PRICES**

**IN THE HARMONIZED INDEX OF CONSUMER PRICES (HICP) - p 352-354 Practicability (3)-(6)**

...

(3) '*Inducements in the form of extras*' (*extra quantity of the product concerned, inclusion of a different product for 'free' or other extra favors*) should be disregarded if they are not significant. The market value of the inducement may be deducted if known but it should then be added back if the offer is withdrawn.

(a) '*x units at a lower unit price than one*' should be disregarded or treated according to the rules applied in the context of specification changes.

(b) '*Free x provided with each purchase of y*' should be disregarded or treated according to the rules applied in the context of specification changes.

(c) '*Money-off-coupons attached to a certain*' good should be disregarded unless offered to all potential customers at the point of sale and claimable at the time of purchase.

(4) '*Discounts available only to a restricted group of households*' should be disregarded because they are discriminatory, unless they are expected to be significant in which case they should be treated as a coverage or stratification issue in sampling.

(a) '*Lower price for e.g. pensioners*' should be disregarded for the purposes of these guidelines (discriminatory). They are most likely a case of tariff or multiple pricing or potentially a population coverage or stratification issue in sampling.

(b) '*Lower prices negotiated for the members of an organised group, e.g. trade unions members*' should be disregarded for the purpose of these guidelines (discriminatory). They are most likely a case of tariff or multiple pricing or potentially a population coverage or stratification issue in sampling.

(c) '*Card for which people pay, which entitles them to discounts at certain shops*' should be disregarded for the purpose of these guidelines (discriminatory). They are most likely a case of tariff or multiple pricing or potentially a population coverage or stratification issue in sampling.

...

(5) '*Regular rebates or refunds*' should only be taken into account when attributable to the purchase of an individual product and granted within a time period from the actual purchase such that it is expected to have a significant influence on the quantities buyers wish to buy.

(a) Deposit for '*money-back-bottles*' should be deducted from the price.

(b) Deposit included in the price of a new car and paid back to the car-owner when the car eventually is handed over by him for destruction should be disregarded as being reimbursed after too long a time to significantly affect the quantities bought at the time of the purchase.

(6) '*Irregular rebates or refunds*' should only be taken into account when they apply to the purchase of an individual product and are granted within a time period from the actual purchase such that it is expected to have a significant influence on the quantities buyers wish to buy. '*Discounts available only to a restricted group of households*' should be disregarded because they are discriminatory, unless they are expected to be significant in which case they should be treated as a coverage or stratification issue in sampling.

(a) '*Loyalty rebates 1, i.e. accumulated points or coupons rewarded for the purchase of a certain good or service can be used to purchase the same good or service at a reduced price (e.g. frequent flyer accounts)*' should be disregarded because they are discriminatory. If they are expected to be important in some population sub-groups and have a significant influence on the quantities bought they should be treated as coverage or stratification issue in sampling to the extent that they are not obtained as a result of business expenditure.

(b) '*Loyalty rebates 2, i.e. accumulated points or coupons can be used to purchase any good or service at a reduced price (e.g. credit card bonus system)*' should be disregarded because they are not relating to an individual good or service and are discriminatory. If they are expected to be important in some population sub-groups and have a significant influence on the quantities bought they should be treated as coverage or stratification issue in sampling to the extent that they are not obtained as a result of business expenditure.