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Consumer Price Index (CPI) 2016

PR0101

This description first provides administrative and legal information on the survey as well as its purpose and historical background. The content and accuracy of the survey are then described, followed by how the survey is carried out and how the results are made available. By clicking on a heading on the contents page, you can move directly to the relevant section.

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A General information

A.1 Subject area

Subject area: Prices and consumption

A.2 Statistical area

Statistical area: Consumer Price Index

A.3 Official Statistics of Sweden classification

Official Statistics of Sweden (SOS) Yes, included in Sweden's official statistics.

Sveriges officiella statistik

Special rules apply for surveys that are included in the official statistics of Sweden concerning quality and availability. See the Official Statistics Ordinance (2001:100)
The Consumer Price Index with constant tax (CPI-CT) is calculated based on the CPI and is included in the Official Statistics of Sweden. For more information on the CPI-CT, click on the heading: **More about this survey,** on Statistics Sweden's website under the Consumer Price Index section.

A.4 Responsible for statistics

Government agency/organisation:	Statistics Sweden
Postal address:	Box 24300, SE-104 51 Stockholm, Sweden
Visiting address:	Karlavägen 100
Contact person:	Oxana Tarassiouk
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A.5 Producer of statistics

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A.6 Obligation to provide information

There is an obligation to provide information for this survey according to the Official Statistics Act (SFS 2001:99).

A.7 Confidentiality and rules for handling personal information

For confidentiality regarding the agency's specific task of the production of statistics, Chapter 24 Section 8 of the Public Access to Information and Secrecy Act (2009:400) applies. No processing of personal data occurs.

A.8 Archiving regulations

As of the 24th of October 2014 it has been decided by The National Archives to repeal decision no. 391 from September 4th 1973. For the Consumer Price Index RA-MS 1998:7 and RA-MS 2006:57 apply.

A.9 EU regulations

The CPI is the starting point for the calculation of the EU measure called Harmonised Index of Consumer Prices (HICP). The regulation is in accordance with Regulation (EC) No 2494/95 of the European Parliament and of the Council. The different countries shall use a common methodology in certain important respects of the HICP, such as selection of an index formula and aggregation principles. Compared to the CPI, the HICP does not include the majority of the housing costs of private home owners, owner-occupied apartments or state gambling proceeds. Unlike the CPI, the HICP includes costs for care of senior citizens, hospital services as well as certain financial services (where the fees are proportional to the size of the transaction). For more information about the HICP, click on the heading “More about this survey” on Statistics Sweden's website under the section Consumer Price Index.

A.10 Objectives and background

The CPI shall measure the average price trend for the entire private domestic consumption based on prices consumers actually pay. The Consumer Price Index is the accepted measure for calculations of compensation and inflation in Sweden. From July 1954 onwards, the CPI has been calculated on a monthly basis. Quarterly data is available calculated from 1949 through June 1954. Historical series with yearly index figures (based on cost of living index and Myrdal-Bouvin's consumer price index) are available from 1830 onwards.

The HICP has been developed to enable comparisons of price trends between countries within the EU. Methods for calculating the national consumer price index and the corresponding indices vary for different countries, and these methods have been coordinated in the HICP. The HICP has been calculated monthly since January 1995.

A.11 Use of the statistics

The primary users of the CPI are:

- The Ministry of Finance: as a basis for decisions in economic policy and stabilisation policy.
- The Ministry of Health and Social Affairs: for establishing the price base amount which is linked to certain pensions, other social benefits and student loans.

- The National Tax Board: for the calculation of conversion ratios for taxation of capital gains on property and for calculating break points in income tax rates.
- The Riksbank: as an explicit target variable and as a basis for monetary policy decisions.
- Statistics Sweden: for deflating in the national accounts as well as statistics concerning turnover and inventory in the service sector.
- Other government administration: among other things, The Swedish Board of Agriculture and the National Institute of Economic Research.
- Organisations, enterprises and individuals: for indexation of agreements and conversions of value amounts to a fixed monetary value.
- Asset management enterprises and institutions: as a basis for assessing future interest rates and real returns.

The principal users of HICP are:

- The European Central Bank (ECB) for evaluating EMU's monetary policy goals and for following up the convergence criterion regarding price stability for membership in the EMU.

A special committee is linked to Statistics Sweden and the CPI, the Consumer Price Index Board. Its functions and composition are regulated in the directive (2007:762) for Statistics Sweden. The Board consists of one chairperson and eight representatives. The chairperson and the other board members are appointed by Statistics Sweden. One board member is appointed on the recommendation of Sweden's Riksbank, one on the recommendation of the National Institute of Economic Research, and one on the recommendation of the Swedish Social Insurance Agency and the National Board of Health and Welfare. Three of the other members shall possess scientific competence such that their combined expertise encompasses economics and statistics.

The Board shall deal with matters relating to the calculation of the Consumer Price Index, and shall in that connection decide matters of principle concerning application of the index calculation criteria, and promote the development of methods for calculating the Consumer Price Index. Memorandum from past meetings of the Index Board in recent years are available on Statistics Sweden's website: www.scb.se/sv_/Om-SCB/Verksamhet/Rad-och-namnder/Namnden-for-konsumentprisindex/Underlag-namnden-for-konsumentprisindex/.

A.12 Design and implementation

The CPI and HICP are calculated monthly based on changes in the prices of goods and services in private domestic consumption. Price data is collected for a sample of so-called representative products and a sample of retail outlets. An update of both of these samples occurs every year. The primary sample methods used include so-called orderly PPS samples with sample probabilities proportional to market shares, independent random samples, and size samples.

Every year there is an update of the weighting figures of product groups and industries. The basis for the weighting figures are the national accounts, the household budget surveys, retail trade statistics and other available market information. Changes in the composition of consumption and other changes on the consumer market are successively taken into account through this procedure.

When calculating the index of the most detailed level of the product group level, the individual price notations are weighted with inverted sample probabilities for products and retail outlets respectively (when a probability sample is applied), and with estimated market shares.

Price collection is conducted locally through visits to shops and telephone interviews by Statistics Sweden's some 40 interviewers, as well as Internet pages in part, and centrally in part by employees at Statistics Sweden. Price collection at the local level is done with the support of handheld computers. Since 2008, the period for local price collection takes place during three weeks: the week that includes the 15th, as well as the weeks before and after this week. The month of December is an exception, since the measurement weeks are extended and brought forward. Price collection for fuel has been carried out during a three-week period since January 2007.

Central price collection is carried out mainly on the 15th of every month or during the week that contains the 15th. Price collection is carried out centrally in cases where a product can be assumed to have uniform prices across the country, or where special methods must be used. Collection is made via the Internet and an e-mail questionnaire.

For daily consumer goods excluding fresh foods, fruit and vegetables, retailers' cash register data that comes directly from the retail chains is used (barcode data, scanner data). Each month, three weeks with 32 000 data each are used.

A total population survey is carried out for prescription drugs and alcoholic beverages with the use of administrative records. For new and used cars, a private enterprise collects about 300 price data each month for Statistics Sweden.

A total of 1 000 price data is included in the collection done by Statistics Sweden's interviewers in the monthly calculations. About 3 300 price data from the central price measurements are included in the monthly calculations. These data sets do not include the prices from retailers' cash registers, prescription drugs, alcoholic beverages, as well as new and used cars. You can read more about measurement under *Section 2.2.3 Measurement* in Part B.

A.13 International reporting

Reporting of HICP (see *Section A.9 EU regulation*) to Eurostat takes place in accordance with established deadlines via Eurostat's online tools and in some cases via e-mail.

A.14 Planned modifications in future surveys

Changes in CPI as of year 2016

Certain changes in the calculations of the Consumer Price Index (CPI) were introduced at the start of the year, which affect the index as of January 2016.

Dental fees in the CPI

The prices of dental measures have previously been measured as the prices dentists charge patients for individual measures, excluding any deductions from the reimbursement system for dental care. As of 2016 the prices will continue to be measured as individual measures. However, the reimbursement system for dental care will be subtracted from the prices dentists charge to conduct the measures, in those cases that these exceed the limit for the reimbursement system.

This is a step closer to measuring patients' actual costs for dental care. The price that is measured in the CPI will thus be affected by changes in the rules for the reimbursement system for dental care as well as the reference prices of the measures.

Scanner data for alcoholic goods

The calculation of the index for the product groups regarding alcohol will be conducted by Statistics Sweden as of 2016, instead of the Swedish retail alcohol monopoly Systembolaget AB. This has been made possible because Systembolaget AB can supply Statistics Sweden with weekly sales data that is aggregated, similar to the grocery trade where Statistics Sweden already uses similar so-called scanner data.

Through this development work, Statistics Sweden can calculate the index on alcohol in the same way as for many other product groups; price ratios are calculated per product with the average price for sales of three-week periods. The annual product sample is drawn from the cash register based data on annual turnover per article. If the articles are discontinued, exchanges are made.

Aggregation of index in electricity survey

A change in the calculation method is under way for the electricity survey in the CPI. Starting in 2016, we will use the ratio between the arithmetic aver-age values in parts of the index calculation, which involves an exception from the

main rule that the elementary index should be calculated with geo-metric average values of price ratios.

The change is being conducted to take into account an inelastic demand from the network market and the fact that it is not possible to substitute electricity to the network and vice versa.

Implementation of listed price as measurement variable for new passenger cars in CPI

As of 2016 price lists of new cars will be procured in the same way as for used cars. This to increase the quality of the survey due to considerable non-response, uncertain price information and a time-consuming survey in the past. We have received a bigger sample, segmented in different car classes, which makes it easier to make quality adjustments/exchanges and a monthly delivery of price information.

Redesign of retail samples for CPI's local price surveys

In connection with the drawing of the sample for shops for price collection, the design of the sample was somewhat changed at the start of 2016. Shops consisting of a maximum of 10 percent of retail trade turnover were allowed to be excluded in municipalities far away from Statistics Sweden's price collectors. The intention of this change is to make price collection more cost-effective so that the total number of price measurements per collection can be increased in exchange for lower travel expenses between the shops.

Entrepreneurial households

Entrepreneurial households will be included in the price index for cost of interest index as of 2016.

Calculation and publication of CPIX ceases

From the January 2016 publication, Statistics Sweden will no longer calculate and publish the underlying inflation according to the CPIX indicator. The funder of this measure has ceased their subscription. No other inflation indicators will be affected.

Handling of sample bias, evaluation

At the start of 2015 price measurements in some newly selected shops already began in September in order to reduce a sample bias that otherwise occurs if price sampling only begins in December (base).
During 2015 Statistics Sweden calculated the costs for the change in method and analyzed the effects of such a change. It should be noted that the data is minimal and uncertainty is thus considerable, but available information shows that the change in method should be favourable.

Change in projection of interest rates

The projection method that is used in the interest rate index has been changed as of 2016.

For more information on the above mentioned changes and previous method changes in the CPI, see the Consumer Price Index Board on Statistics Sweden's website: www.scb.se/sv_/Om-SCB/Verksamhet/Rad-och-namnder/Namnden-for-konsumentprisindex/Underlag-namnden-for-konsumentprisindex/.

B Quality declaration

B.0 Introduction

Statistics Sweden describes the quality in surveys according to the quality concepts that consist of five main components:

Contents
This section describes the contents of the statistics to show how well the statistics meet external requirements and requests.

Accuracy
Information in this section reveals the degree of accuracy for the statistics. In order to structure the information, different sources of uncertainty are treated that have an impact on the statistics' quality. What Statistics Sweden does to minimise these inaccuracies is also discussed here.

Timeliness and punctuality
This section provides information about the time interval between the publication of the statistics and the statistics' reference time as well as information on publishing frequency and how well the publication plan has been followed.

Comparability and Coherence
This section deals with various aspects affecting comparability of statistics over time and between groups, as well as the possibilities of using the statistics together with other statistics.

Availability and clarity
This section indicates the media and channels where the statistics are available. Information is also provided on how to gain access to the statistics' documentation. Other references are also provided here to studies, handbooks, etc. that are relevant for the interpretation of results and the accuracy of the statistics.

For more information on the concept of quality of official statistics and a more detailed account of the meaning of the five main components, see the report

Quality definition and recommendations for quality declarations of official statistics (MIS2001: 1) in the series *Meddelande i samordningsfrågor för Sveriges officiella statistik.* The publication is available on Statistics Sweden's website

B.1 Contents

1.1 Statistical target characteristics

1.1.1 Objects and population

The population consists of all the transactions in private domestic consumption during the period that the price index refers to. The number of objects in the population cannot be counted, nor is it possible in practice to observe and measure the transactions, except under certain circumstances.

The statistical population is two-dimensional. There is a population of retail outlets (shops, service outlets, websites etc.) that to some extent change during the year as some objects cease, are added or are changed. The other dimension refers to the products (goods and services). Certain products must be considered as having ceased and others are to come, while others are treated as substitutes for each other, even though they are not exactly alike.

A product offer is a certain good or service that is offered for sale at a given price at a certain retail outlet (i.e. a shop), according to certain terms at a certain time point. A sample of the product offers are observed each month.

1.1.2 Variables

The primary variable is the price of the product that the consumer actually pays. To be able to adjust the prices for comparability between the product offers, packaging sizes and quality characteristics are also collected.

1.1.3 Statistical measures

CPI: Index figures (1980=100, 1949=100), change in percent since the previous month, change in percent during the most recent 12-month period.

The CPI is calculated as a chain index with annual links. Every annual link measures how much the average price level has changed during the year from the average price level in the previous year. You could say that the chaining runs via the whole year. The weighting factors are the geometric mean of the consumption volume of the two years concerned. A final link measures the change in the current month's price level from the average price level of the full two years before. The weighting factors here represent full-year consumption volumes for the two years before. Index figures with 1980 as the base index year are calculated by multiplying together, i.e. chaining together, annual links (via the full year) and ending with the link for the relevant month. For more information about index construction in the CPI, see the memorandum, *Förbättrad KPI-konstruktion från 2005: Teknisk beskrivning,* on Statistics Sweden's website: www.scb.se/statistik/PR/PR0101/2004M03/Pm11307.pdf

HICP: Index figures (December previous year = 100, 2005 = 100), percentage changes since the previous month, percentage changes in the most recent 12-month period. Like the CPI, the HICP is a chain index with annual links, but with chaining via December.

1.1.4 Study domains

In the regular reporting of CPI and HICP, there are 12 main categories and some 90 sub-categories of products in private consumption according to the international standard for Classification of Individual Consumption by Purpose (COICOP).

1.1.5 Reference time

Monthly figures refer to the CPI's entire measurement period, which in some cases means the 15th day of each month or the next weekday (for example, short-term interest rates for private dwellings) and in other cases for the entire week that includes the 15th (for example, tickets to sporting events, theatres and dance halls) or during a three-week period, for example, food, clothing and fuel (see also *Section A.12 Design and implementation*). The exception is mainly for rental apartments that refer to the entire month. Annual averages are formed by unweighted arithmetic averages of monthly figures. The CPI index reference year is 1980.

At the beginning of 2016, the index series for the HICP and HICP-CT base year 2005 = 100 will be replaced by 2015 = 100

1.2. Comprehensiveness

The CPI shall measure price trends for all private consumption according to the National Accounts. Based on the CPI three measures of underlying inflation, the CPIF, the CPIF-CT and the CPIX are calculated on behalf of the Riksbank. HICP is used for comparisons with other countries within the EU.

Currently, about 95 percent of total private domestic consumption in the CPI is broken down into 360 product categories. The greatest difference between private consumption and the amount used to calculate the CPI weighting factors is in the housing area (mainly in the group 04.x Owner-occupied housing: use of the dwelling). The difference is based on the calculation of the weighting factor in the CPI using a cost estimate that is consistent with the way housing costs are considered in the index calculations, while the budget amount in private consumption is based on a rental equivalence approach. Other areas not included in the CPI consist largely of health and social care fees, certain financial services and various other services (for example, brokerage services, company car benefits, etc.). For a more detailed explanation, see the memorandum, Undercoverage in the CPI, on Statistics Sweden's website www.scb.se/statistik/PR/PR0101/Undertäckning%20i%20KPI.pdf.

HICP contains about 80 percent of the private domestic consumption. See *Section A.9 EU regulations* for a comparison of what is included in the CPI and the HICP respectively.

B.2 Accuracy

2.1 Overall accuracy

The most important sources of error in the CPI and the HICP are weighting factor error, coverage error, sampling error and errors due to changes in quality of the products that are measured for price (a form of measurement error). The method of calculation established for sub-surveys also significantly affects the result. This applies especially to the homeowner item.

2.2 Sources of uncertainty

2.2.1 Sample

Three types of samples in the CPI
The three types of processes for samples used in the CPI are as follows:

1. A sample of retail outlets (shops, supermarkets, restaurants etc.) in the CPI is drawn annually in May with a so-called rotated sequential Poisson sampling with inclusion probabilities proportional to size (orderly PPS samples). Every year an estimated 20 percent of the objects are replaced, another 10 percent are replaced due to changes in the population and 70 percent of the objects remain in the sample for the following year. The sample is drawn from the frame for economic statistics, the coordinated sample system (SAMU) that is collected from the Business Register. The objects that are included in the CPI's local price collection are divided into some 40 strata by industry according to Swedish Standard Industrial Classification (SNI 2007). The sample for several central price collections, such as electricity, healthcare and entertainment, are updated to a certain extent annually.
In connection with the selection of the sample for shops for price collection, the design of the sample was somewhat changed at the start of 2016. Shops consisting of a maximum of 10 percent of retail trade turnover were allowed to be excluded in municipalities far away from Statistics Sweden's price collector’s residence. Also a first selecting step of geographical areas (based on ZIP code) introduced to concentrate the travel of price collectors. The purpose of these changes is to make the price collection more cost effective so that the total number of price measurement per collection can be increased in exchange for less travel expenses between shops.

2. Prices for packaged food, laundry detergent and other everyday items are collected from about 80 shops in three groups of retail chains. For every group of retail chain, a sample of 800 carefully specified representative products is made in some 90 product groups. The sample is made from the statistics collected from the data systems of the shops (cash register data). They are randomly drawn with probability in proportion to total sales. Samples of products for price comparisons at pharmacies (not pharmaceuticals, which are measured in a different survey), tobacco shops and health food stores are also selected using the same method. The sample for representative products is updated annually. However, the sample of products is updated less often than the sample from the retail outlets.

General product specifications are decided on centrally for a large part of the remaining price collection; i.e. a deliberate sample is used here. Among other things, information from the household budget survey is used as a source for this sample. The interviewer who collects this data is instructed to choose the most popular alternative for each product, i.e. the one that sells the most (in volume).

3. The third sample process includes the choice of specific products from retail outlets in the sample from retail trade. Since 30 percent of the objects from retail trade are replaced each year, of course even the products from these retail outlets are new in the sample. The products also have to be replaced as they disappear from the market.

Sample in the CPI central price collection
The sample of retail outlets and products in the central price collection is partly drawn with the help of PPS samples and partly with the help of a modified ratio sample or cutoff-sample. A total sample, i.e. all products in a certain product group, is used for some products.

Weights
Weights for products and industries that are included in the CPI are updated annually. These weights are based on information from several sources, of which the most important are the surveys such as the household budget survey. Due to significant margins of error, data from several years of the household budget survey is used. Errors in the weights lead to errors in the CPI statistics that have not yet been evaluated.

Complexity in the CPI influences uncertainty of the sample
Uncertainty of the sample, margin of error, is a measure of the uncertainty that occurs when a value is estimated after having studied a sample of a population instead of the entire population. The estimated size of the uncertainty of the sample is often expressed as a confidence interval.

The sample of the retail outlets and products are selected once a year. The uncertainty of the sample that occurs is thus to an extent a constant influence on the index for an entire calendar year at a time. This means that the sample causes indexes that are too low or too high for the entire calendar year until a new sample is drawn. Norberg (2004) found that the third sample process, the choice of specific product offers, usually contributes the most to the total sample uncertainty. The effect varies from month to month, and the index for one month can be too high and for the next month too low.

Some of the most important CPI key figures use several annual links, such as the inflation rate that is calculated as a change from year *y-1* month *m* to year *y* month *m*. The sampling error for the rate of change means sampling errors from two samples (samples from two years).

Estimating sampling errors in the CPI
Dalén & Ohlsson (1995) propose an analytic procedure for estimation of variance in a cross-classified design with a sample of retail outlets and products. This method can be applied to the short index link from the base month December year *y-1* for the current month year *y* and month *m*.

Dalén (2001) uses approximations and reasoning to motivate which method best estimates the sampling error to measure the changes in the CPI that include more than an annual link.

Norberg (2004) uses variance analysis models to study the variance structure for price changes. Variance estimations with analytical methods are compared with estimations based on these models as well as variance estimations based on resampling procedures. Resampling means that a large number of small samples are drawn from the survey sample, and the variation in results based on these samples are analysed. The method allows for variance estimations for complex functions of index links, such as the inflation rate or the change of the inflation rate, without making further assumptions. All three methods provide variance estimations of roughly the same size.

Nilsson, H et.al. (2008) gives new estimations of sampling errors for centrally collected product groups, which include the remaining 46 percent of consumption. A suitable method is used for each sub-survey, and the conditions vary. Several of the sub-surveys do not use a probability sample.

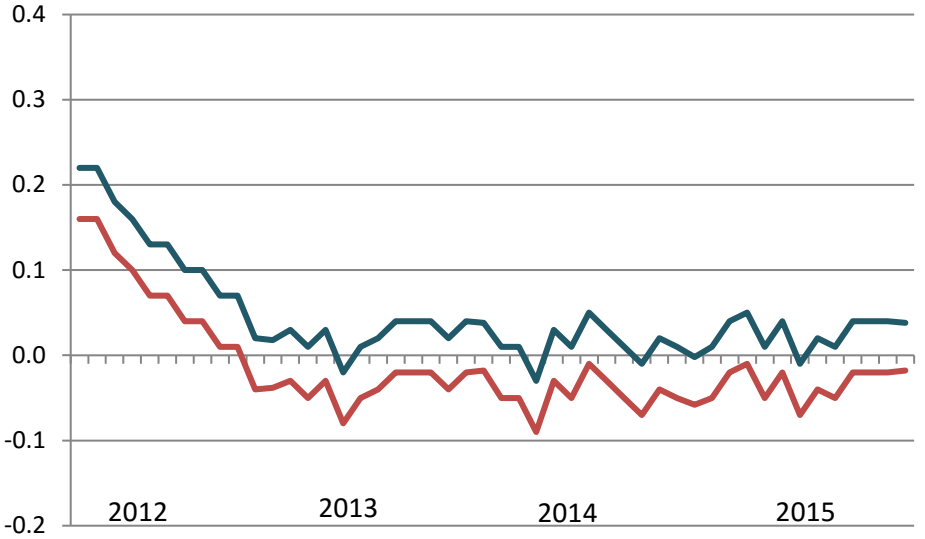
Estimations of sampling errors
Based on the above four articles, the sampling errors for the CPI statistics have been calculated for the most recent year. The results are illustrated in the table below:

Table Estimated sample uncertainty, length of 95 percent confidence interval 2012

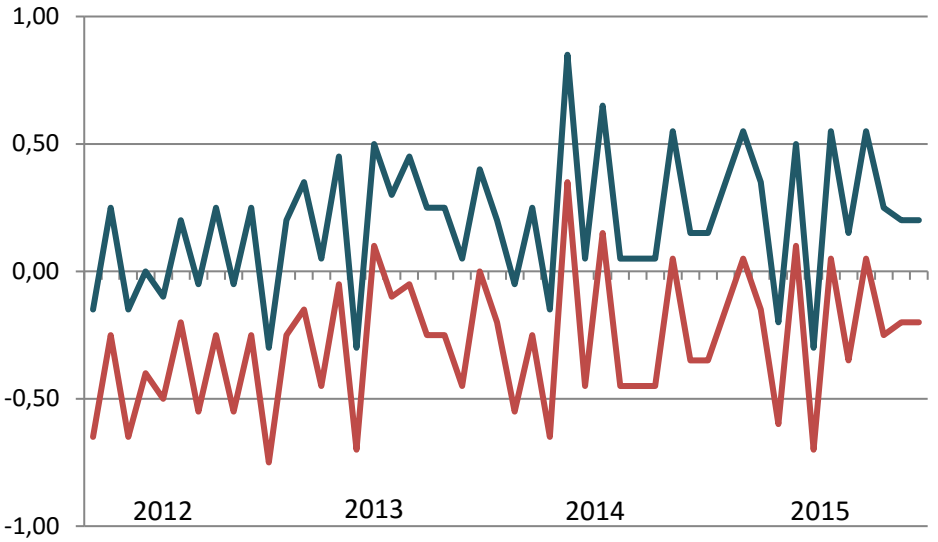
Statistics	Estimated length of 95% confidence interval	Comments
Monthly change	±0.15 - ±0.2	± 0.15 in April, May, June, November and ±0.2 for the other months
Annual change (inflation rate)	±0.3	Somewhat lower in December[1]
Monthly change in inflation rate	±0.2 - ±0.25	±0.2 in April, May, June, November, December and ±0.25 for the other months

1 Change from December to December is based on one and the same sample.

Graph 1: Inflation rate 2012-2015, 95 percent confidence interval



Graph 2: Monthly development of the inflation rate 2012-2015, 95 percent confidence interval



How to reduce sampling errors

In general, sampling errors can be reduced by increasing the size of the sample. Statistics Sweden is making progress in using cash register data from retailers of everyday goods (bar code data) that is delivered directly from the retail chains. By using this data the sampling error can be reduced, as well as the cost for collection of data. A larger budget is required to increase the sample size for most of the other products.

2.2.2 Frame coverage

A so-called *gross sample* of retail outlets is drawn in May for local measurements of the CPI. The sample is first checked centrally and subsequently visited by interviewers, mainly with regards to timeliness and which products are sold. The retail outlets that remain after this review comprise next year's *net sample* which has very little overcoverage. Sales via the Internet and mail order are possibly still somewhat underrepresented. Sales at marketplaces are not measured at all. Coverage of shops is generally good. However, the measure of the size of the retail outlet, measured in the number of employees and turnover according to VAT statistics, is poorly correlated with sales (in SEK) for individual product categories. Among other things, this means that retail outlets with a high turnover per employee are under-represented and that retail outlets with high sales to others than private consumers are over-represented. New retail outlets that open during the index year are ignored and cause a bias (from 0.03 to 0.05 index points according to the manual "The Swedish Consumer Price Index, A handbook of methods" (2001)).

The index on the product group level is calculated for 360 groups with weighting factors that stem from the national accounts, the household budget surveys and other available market information. Coverage is generally good. Other areas not included in the CPI consist largely of health and social care fees, certain financial services and various other services (for example, brokerage services, company car benefits, etc.). An intentional undercoverage is created for "impossible" product categories, such as art objects and some seasonal goods like strawberries and beachwear.

A current or complete sampling frame is often lacking regarding the product sample within each product category. For example, there is no list for dining tables that describes quantities/values concerning size, form, material, surface treatment, extra leaves etc. For these kinds of products, one or several representative groups of goods is intentionally created with size intervals, form etc.

A deliberate undercoverage is created by measuring only certain combinations of product categories and branches of the retail outlets. Sales of things like food, tobacco, fast food, sunglasses and toys at petrol stations are thereby excluded. Newspapers and tobacco are measured in some industries, but are sold in many. This is considered a small problem, as the prices are quite similar for these product categories through central decisions.

Some product categories in the CPI are not measured directly but are represented by the other categories. The most important example is owner-occupied apartments that are represented by rental apartments.

2.2.3 Measurement

Prices are collected locally in shops by about 100 interviewers who conduct visits and telephone interviews, and centrally by Statistics Sweden by postal questionnaires, e-mail questionnaires and websites. Some minor studies have shown that interviewers note prices incorrectly due to registration errors and incorrect

price information in the retail outlets. The Swedish Consumer Agency has shown that price information is deficient by an average 6 percent. This leads to a measurement error in the CPI, which should preferably be measured at the price that consumers actually pay.

Quality assessment when replacing goods, general
The Consumer Price Index shall not be affected by changes in prices due to changes in the quality of goods and services. When the products are altered or even must be replaced (substituted), a quality assessment is done to remove the difference in observed prices due to different quantities and qualities.

Quality assessment of everyday items
Few quality assessments are made for everyday items. The same exactly specified product is measured every month as long as it is marketed (e.g. coffee medium roast, brand A, 500 grams). In some cases it is possible to find a completely replaceable item, especially when the manufacturer has made a minor change. In some cases, prices are adjusted for small changes of quantity, packaging form and the like.

Quality assessment when replacing clothing
A hedonic quality assessment is done for clothing. In these groups of goods, the lifespan is very short and several replacements need to be done during a twelve-month period. In hedonic regression, considerable amounts of data are used concerning the goods' appearance and content in order to assess the market value of these characteristics. In addition to prices, the interviewer thus also collects data on the different characteristics of the clothing.

Quality assessment when replacing shoes
Regarding shoes, a tight product description is used which means that the product offers that are replaced are usually like the ones that they replace. The hedonic regression is used in product exchanges between brand groups to assess the market's valuation of the difference between the brands.

Quality assessment when replacing computers and mobile phones
For computers and mobile phones, a method called monthly chaining (MCR) is used to handle the exchanges. A new computer is not included in the index calculation until it has existed for two consecutive months. The index is calculated with very short links that refer to the change between two consecutive months. Each of these links includes the product offers that were available in the same form during both months. The sample is thus replaced gradually during the year since the lifespans for the products are short. An index for the change from December year *y-1* to the current month year *y* and month *m* is given by multiplying the monthly indices. The method is based on a market that has strong competition, that technology develops quickly and that retailers are thus motivated to check prices often and give updated price information to their customers.

Quality assessment when replacing music CDs, video films etc.
Price collection of music CDs, videos, etc. is made from the respective store's list of sales ranking. This means that titles on the top sales lists are assessed as

comparable over time. Any quality change upon replacement of titles on the top sales lists is not measured.

Quality assessment when replacing other products in local price measurements
For other locally collected prices the interviewer selects a new representative product when the previously measured product is no longer sold or no longer sold in any significant amount. Together with store clerks, the interviewer assesses the value of any quality difference between the new product and the old one. For example, if an increase in quality can be considered to correspond to an observed price difference, the price index of the good will remains unchanged. If the quality of the change is considered equivalent to one-half of the price change, then one-half of the price difference may take effect as a price change etc.

Collection of price information
Prices are collected centrally at Statistics Sweden for products in about 100 product categories, including those cases where a product is likely to have uniform prices across the country, or where special methods must be used. One such product category is, for example, theatre tickets. The products consist of different types of theatre tickets that can be purchased at various theatres around the country. Changes in quality are assessed in virtually the same way in the central price collection as for the "other products" above.

Measurement of housing costs
The trend in housing costs is measured in part through monthly rental surveys with a probability sample of dwellings, that is done monthly. In addition, price data is collected centrally for heating and electricity.

Summary
The lack of clarity and inability to define quality and to measure quality differences comprise a relatively big problem for the CPI and HICP.

Price trends are calculated for approximately 360 product groups, with weighting factors that are based on preliminary annual calculations of the national accounts concerning households' consumption expenditures, household budget surveys and retail trade statistics as well as other sources with information about private consumption of different products.

2.2.4 Non-response

In visits to shops, telephone interviews, online data collection and direct collection from enterprises, the non-response is nearly non-existent; in the monthly rental surveys it is roughly 5 percent. Both unweighted and weighted non-response in price measurements are a small problem in comparisons with other sources of uncertainty. The household budget surveys, which are a basis for the weighting factors have a large amount of non-response, which in many cases renders the weighting factors uncertain at a detailed level. A measurement of uncertainty has not been carried out.

2.2.5 Processing

An IT system called Pi09 has been developed to perform most of the CPI calculations. A few calculations are performed without the Pi09. Quality assurance of computer programs and IT systems are now in place and the risk for processing errors is therefore small. Handheld computers have made it possible to perform editing directly during the collection of data. It is not possible to assess the impact of various types of processing errors.

The collected observations are reviewed if errors are suspected. Contact is often taken with the retail outlet where the observations have been collected, or with the person collecting the data (interviewer) in those cases where price observation is collected locally.

2.2.6 Model assumptions

A so-called hedonic method for quality adjustment is used in the measurement of price trends for clothing. Consumer evaluations of various details of a garment are estimated using a statistical model and cross-sections of CPI data for a limited period of time of one year. When garments are discontinued in the store's assortment, these valuations are used to calculate the prices of replacement garments so that their price level is comparable with the base versions in terms of quality. Compared with other product categories, the index calculation for clothes has a large random error (variance). The calculation has been shown to be relatively insensitive to the choice of hedonic model.

Some product categories in the CPI are not measured directly but are represented by the other categories. The most important example is owner-occupied apartments that are represented by rental apartments.

Otherwise, many different model assumptions are used depending on the consumer area surveyed. For example, consumption profiles are estimated for electricity consumption and telecommunications services for which price trends are surveyed.

2.3 Presentation of uncertainty measures

Uncertainty figures correspond to a 95 percent confidence interval (standard deviation multiplied by 1.96). There are uncertainty figures for changes in the rate of inflation on a monthly and annual basis.

B.3 Timeliness

3.1 Frequency

CPI, CPI-CT, HICP, HICP-CT, and CPIF, CPIF excluding energy, CPIF-CT are calculated and published monthly.

3.2 Production time

Production time is about four weeks (five weeks for January). Publication is usually 10-14 days into the next month after the reporting month. However, the index figures for January are usually published a few days later than is the practice for other months, due to the calculation of the year's weighing factors.

3.3 Punctuality

The publishing follows the original publishing plan for the Official Statistics of Sweden. http://www.scb.se/sv_/Hitta-statistik/Publiceringskalender/?Produkt=PR0101

B.4 Comparability and Coherence

4.1 Comparability over time

The CPI is a chain index with annual links. Methodology changes usually take place at the end of the year, that is, before a new annual link. Jumps in the time series will therefore not normally occur since the new index link (with or without new methods) will be linked to the previous index link. Times series breaks in the form of new seasonal patterns may occur.

Major changes over time are described below

- For everyday items (non-perishable goods), price lists instead of measurements at shops were used beginning 1983 through 1992.
- For clothing, a new measurement method was introduced beginning 1991 and a new method for valuation of quality differences was introduced beginning 1994.
- Beginning April 1990, a new method was introduced for weighing up the individual price notations that the index is based on. During the period January 1990 - March 1990, a divergent methodology was used compared to both the period before as well as the period after.
- Beginning 1984, calculations for owner-occupied housing costs were modified regarding interest and depreciation.
- Seasonal adjustments for fresh vegetables and fruit ceased beginning 1992.
- As of April 1997, a new method was used for calculating costs for owner-occupied housing with regards to interest rates. The change in method means that shifts in weighting during the year between loans with different fixed rate periods do not affect the index. The change also means taking into account the cost for redemption charges payable on early repayment of mortgage loans.

New construction of the index beginning 2005.
Beginning January 2005, the Consumer Price Index (CPI) is calculated with a new construction for the index. At the same time, the inflation rate had begun to be calculated as the percentage change in the CPI over the past twelve months. The measurements related to the CPI, i.e. the CPI-CT, CPIF (CPI with fixed interest), CPIF excluding energy and CPIF-CT are also calculated in another way as a result of the method changes for the CPI and the inflation rate. The CPI will continue to be reported as an index figure with the base year 1980 = 100. The CPI figures from January 2005 will be a direct continuation of the previous series of CPI figures. Viewed on the average over many years, the revision of the

index construction is expected at most to have a marginal impact on the calculated CPI figures. No consistent tendency can be statistically established on the existing basis.

Statistics Sweden provides backcasted time series with inflation rates calculated using the new method (applied to existing CPI figures) from 1980 and onwards. The Harmonised Index for Consumer Prices (HICP) is not affected by the above noted methodological changes to the CPI and the inflation rate. The HICP has been calculated since January 1995. There is full comparability over time.

Revision of established index figures does not occur.

4.2 Comparability among groups

The CPI measures the average price trend using the same method for all subcategories included in the CPI. There is full comparability of price trends among the categories.

4.3 Coherence with other statistics

The CPI can be used in several contexts to deflate, for example, the national accounts and the service industry statistics. Comparisons of price trends for producer and import prices are difficult for several reasons. For example, taxes are handled differently and weighting factors differ.

B.5 Availability and clarity

5.1 Dissemination forms

The following dissemination forms for the CPI, CPI-CT and HICP are available on Statistics Sweden's website www.scb.se:

- Sweden's Statistical Databases.
- Statistics Sweden Press information (issued at the same time with the monthly Statistical Report and Sweden's Statistical Databases).
- Economic flash indicators (same time as above).
- 24/7 answering service with data on the most recent CPI and price base amount.
- The publication SCB-Indikatorer (Statistics Sweden Indicators. Issued according to special publishing plan).

5.2 Presentation

Text, tables and figures.

5.3 Documentation

The quality of the statistics is described in the present document, *Beskrivning av statistiken (BaS*).

- Norberg, A. (2013). Detaljerat underlag för variansskattning. Pm till Nämnden för KPI 2013-10-15
- Nilsson, H., Ribe, M. and Norberg, A. (2008) ”Variansberäkningar KPI” Projektrapport, SCB, 2008-04-10.

- Norberg, A. (2004). Comparison of Variance Estimators for the Consumer Price Index. 8th Ottawa Group Meeting - Helsinki - 23-25 August 2004
- Dalén, J. (2001): Urvalsosäkerheter för olika tidshorisonter i KPI. SCB, working paper
- Dalén, J. and Ohlsson, E. (1995): Variance Estimation in the Swedish Consumer Price Index. Journal of Business and Economic Statistics, Vol. 13, No. 3, 347–356
- The Swedish Consumer Price Index, A handbook of methods.
- Consumer Price Index: Konsumentprisindex: Betänkande från utredningen om översyn av konsumentprisindex SOU 1999:124
- Jörgen Dalén: The Swedish Consumer Price Index - major features
- Margareta Ringqvist: Att mäta inflationen.
- SM PR 15: Konsumentprisindextal 1914-2005.
- PM from the CPI board.
- Förslag till riksdagen; Riksdagens revisorers förslag angående konsumentprisindex (Förs. 1991/92:16).
- Uppdrag åt SCB att beräkna konsumentprisindex m.m., Kungl. Maj:ts (Finansdepartementet) beslut den 28 juni 1962.
- 1955 års bostadsindexutrednings betänkande Bostadsposten i konsumentprisindex.
- Grunderna för KPI m.m.: 1952 års indexkommittés betänkande (SOU 1953:23) Konsumentprisindex; Prop. 1954:1, bilaga 2;Statsutskottets utlåtande 1954:13; Riksdagens skr 1954:92.

5.4 Access to primary data

Materials regarding interview surveys and samples from shops are stored in the SQL database. In the case of centrally collected prices, material is partly stored in the SQL database and partly stored in Excel files. Statistics Sweden conducts special processing of the material on a commission basis. The lowest reporting level is the product category stratum according to the YM1 index table where indices and weights are presented at the four-digit COICOP level.

5.5 Information services

- Statistics Sweden's Statistics Service weekdays 09:00-12:00, 13:00-16:30, phone +46 8 506 948 01
- E-mail: information@scb.se
- See also under *Section 5.1 Dissemination forms*.