

Consumer Price Index (CPI) 2014

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



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 Net Price Index (NPI) and the Consumer Price Index (CPI) with constant tax is calculated based on the CPI and is included in the Official Statistics of Sweden. For more information on the NPI, click on the heading: **More about this survey**, on Statistics Sweden's website under the Consumer Price Index section.

Based upon the CPI, three measures of underlying inflation, CPI with fixed interest, CPI with fixed interest and constant tax and CPIX are also calculated based on the CPI, and this is done on behalf of the Riksbank. These measurements are not included in the Official Statistics of Sweden. For more information about the underlying inflation measures, click on the above-noted heading on Statistics Sweden's website.

Information is available about the Harmonised Index for Consumer Prices (HICP) under *Section A.9 EU regulations*. The HICP is not included in the Official Statistics of Sweden. More detailed information about the HICP can also be found via the above-noted pathway on Statistics Sweden's website.

A harmonised constant tax index called the HICP-CT (Harmonised Index of Consumer Prices at Constant Tax Rates) is calculated as a complement to the EU harmonised index HICP. The HICP-CT is calculated so that the direct effects of changes in tax rates that occur on the consumer level are not reported as price changes.

A.4 Responsible for statistics

Government agency/organisation: Statistics Sweden
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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

National Archives archiving decision no. 391, 4 Sep 1973.

The archiving regulations are currently being studied for the Consumer Price Index; until new archiving regulations have been created, information is not being eliminated. Original forms are kept for three years.

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 apart-

ments 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 major 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: <http://www.scb.se/sv/Hitta-statistik/Statistik-efter-amne/Priser-och-konsumtion/Konsumentprisindex/Konsumentprisindex-KPI/Produktrelaterat-ovrigt/Namnden-for-konsumentprisindex/Underlag/>.

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 100 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 42 000 data each are used.

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

A total of 13 000 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, 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

Certain changes were introduced in the calculations of the Consumer Price Index (CPI) and related measurements as of the publication concerning January 2014.

The step with aggregation by industry at the lowest level has been discontinued

As of 2014 the calculation of the index at the lowest level will be done more directly than previously. This means that the so-called elementary aggregates will no longer be broken down by industry within the product groups. The elementary aggregates will continue to be calculated directly for all price observations per product group, regardless of industry. This applies to product groups for daily consumer goods, apparel and other products with locally collected prices. The change will bring about a more efficient calculation by a better relation between the precision in the CPI and the costs for the price collection.

The CPI-CT (CPI with constant tax) and the CPIF-CT (CPIF) with fixed interest and constant tax will be introduced. Net Price Index (NPI) to be discontinued.

As of January 2014, Statistics Sweden no longer publishes the Net Price Index (NPI), but the figures are available upon request up until the index for

December 2014 when the Net Price Index will be calculated for the last time. At the same time, Statistics Sweden will be calculating a new index called CPI-CT (CPI with constant tax), which in some cases can replace today's use of the NPI. An index series for the CPI-CT (1980_100) as well as rates of change was published in connection with the January index for the CPI on 18 February 2014. Statistics Sweden will also calculate and publish another measurement on behalf of the Swedish Riksbank called CPIX (CPI with fixed interest and constant tax). The calculation of the CPI-CT (and even the CPIX) methodically follows the previous calculations of the constant tax index that Statistics Sweden made on behalf of the Swedish Riksbank. However, there are a few differences:

- The CPI is calculated with constant real tax instead of constant nominal tax in the CPI-CT and CPIX. In the previous constant tax index, the adjustment of effects from changed taxes (and product subsidies) has been made when these have been changed nominally. In the CPI-CT and the CPIX, the adjustment has instead been made monthly at the rate that the general price level has been changed, i.e. when real taxes have been changed. This results in more uniform treatment of different types of taxes (quantity taxes and value taxes).
- The calculation of real tax change in the CPI-CT and the CPIX is done by deflating the rates of change for each tax with the consumer price index for the corresponding period.
- The adjustment for the effects of changed indirect taxes and product subsidies is done from the total CPI and the CPI with fixed interest and not from the CPI excluding the interest cost item.
- A differentiation for taxes and subsidies is made in the CPI-CT and the CPIX with only slight taxation or the equivalent; these are not held constant.

Cash register data

Beginning 2012, data from cash registers is used for many of the everyday items. During 2014 testing and valuation of more cash register data will be done. It is hoped that especially time-consuming price measurements can be replaced for increased efficiency and better precision.

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: <http://www.scb.se/sv/Hitta-statistik/Statistik-efter-amne/Priser-och-konsumtion/Konsumentprisindex/Konsumentprisindex-KPI/Produktrelaterat-ovrigt/Namnden-for-konsumentprisindex/Underlag/>

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,

http://www.scb.se/Grupp/Hitta_statistik/Forsta_Statistik/Metod/_Dokument/MIS2001_1.pdf.

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: <http://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.

The HICP index reference year is 2005.

1.2. Comprehensiveness

The CPI shall measure price trends for all private consumption according to the National Accounts. The Net Price Index, NPI, is calculated based on the CPI as are three measures of underlying inflation, the CPIF, the CPIF-CT and the CPIX 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 364 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 <http://www.scb.se/statistik/PR/PR0101/Undertäckning%20i%20KPI.pdf>.

HICP contains about 85 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.

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.

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 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 of 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.

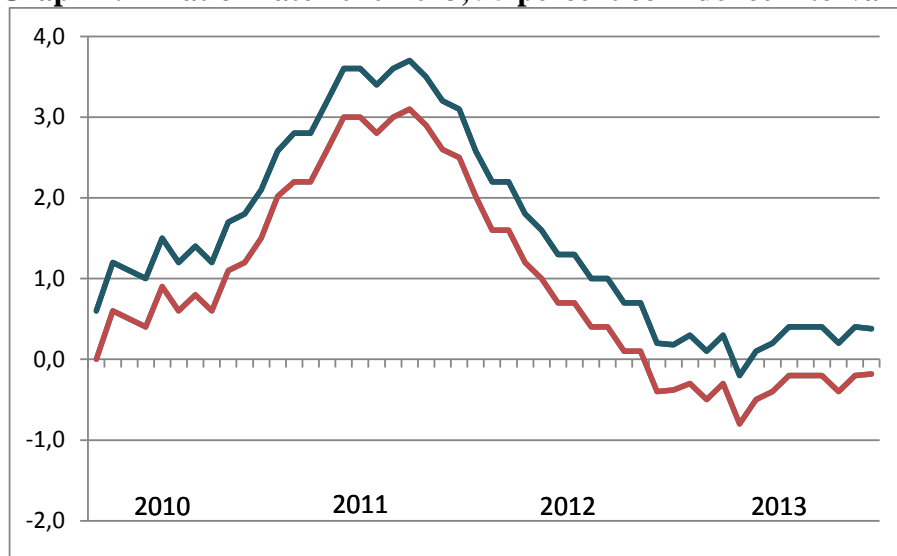
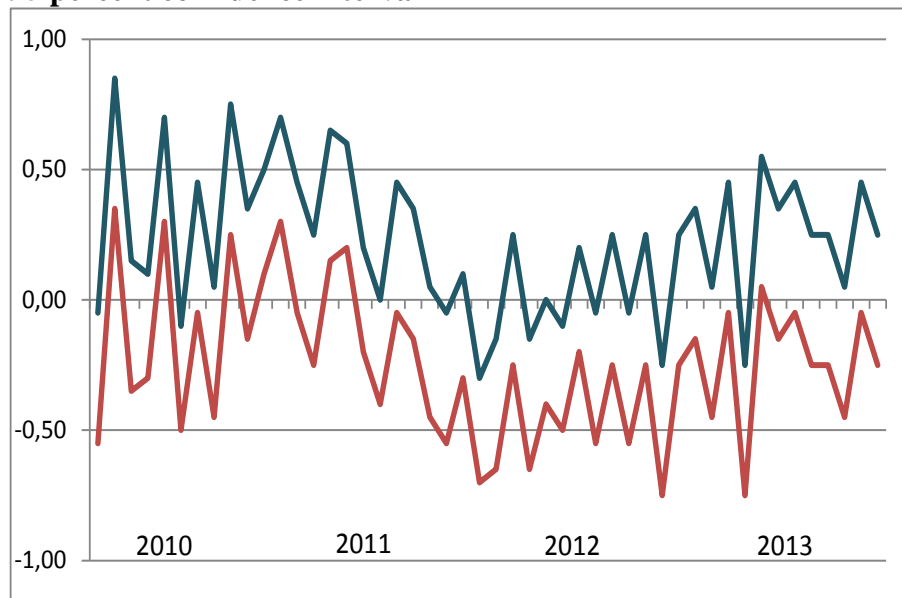
Estimations of sampling errors

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 *Table 1*.

Table 1 Estimated sample uncertainty, length of 95 percent confidence interval 2012

Statistics	Estimated length of 95% confidence interval	Comments
Monthly change	$\pm 0.15 - \pm 0.2$	± 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	$\pm 0.2 - \pm 0.25$	± 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 2010-2013, 95 percent confidence interval**Graph 2: Monthly development of the inflation rate 2010-2013, 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 364 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. 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, that 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, a method called monthly chaining 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 remain 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 364 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, CPIX and CPIF are calculated and published monthly. The publication of the Net Price Index (NPI) ceases in January 2014, but the figures are available upon request. The Net Price Index will no longer be calculated as of January 2015.

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.

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 NPI, CPI-CT, CPIF, CPIF-CT and CPIX 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.
- Statistical Report 14: Consumer Price Index, monthly.
- 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 bases for the CPI, etc.: 1952 års indexkommittés betänkande (SOU 1953:23) Konsumentprisindex; Prop. 1954:1, bilaga 2; Statsutskottets utlåtande 1954:13; Riksdagens skr 1954:92; Riksdagens skr 1954:92;
- 1955 års bostadsindexutrednings betänkande Bostadsposten i konsumentpris-

index;

- Commissioning of Statistics Sweden to calculate the Consumer Price Index etc., His Majesty's (Ministry of Finance) decision of 28 June 1962.
- Proposal to Parliament; Riksdagens revisorers förslag angående konsumentprisindex (Förs. 1991/92:16. 1991/92:16).
- PM och protokoll från nämnden för konsumentprisindex.
- Statistical Report: Consumer Price Index figures 1914-2005
- Margareta Ringqvist: Att mäta inflationen.
- Jörgen Dalén: The Swedish Consumer Price Index - major features
- Consumer Price Index: Konsumentprisindex: Betänkande från utredningen om översyn av konsumentprisindex SOU 1999:124
- The Swedish Consumer Price Index, A handbook of methods, <http://www.scb.se/statistik/PR/PR0101/handbok.pdf>
- Dalén, J. and Ohlsson, E. (1995): Statistics Sweden (2001) "The Swedish Consumer Price Index. Journal of Business and Economic Statistics, Vol. 13, No. 3, 347–356
- Dalén, J. (2001): Urvalsosäkerheter för olika tidshorisonter i KPI. Statistics Sweden, working paper
- Norberg, A. (2004). "Comparison of Variance Estimators for the Consumer Price Index" 8th Ottawa Group Meeting - Helsinki - 23-25 August 2004
- Nilsson, H., Ribe, M. and Norberg, A. (2008) "Variationsberäkningar KPI" Projektrapport, SCB, 2008-04-10.

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.

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: priser@scb.se
- 24/7 answering service with data on the most recent CPI and price base amount.
- See also under *Section 5.1 Dissemination forms*.